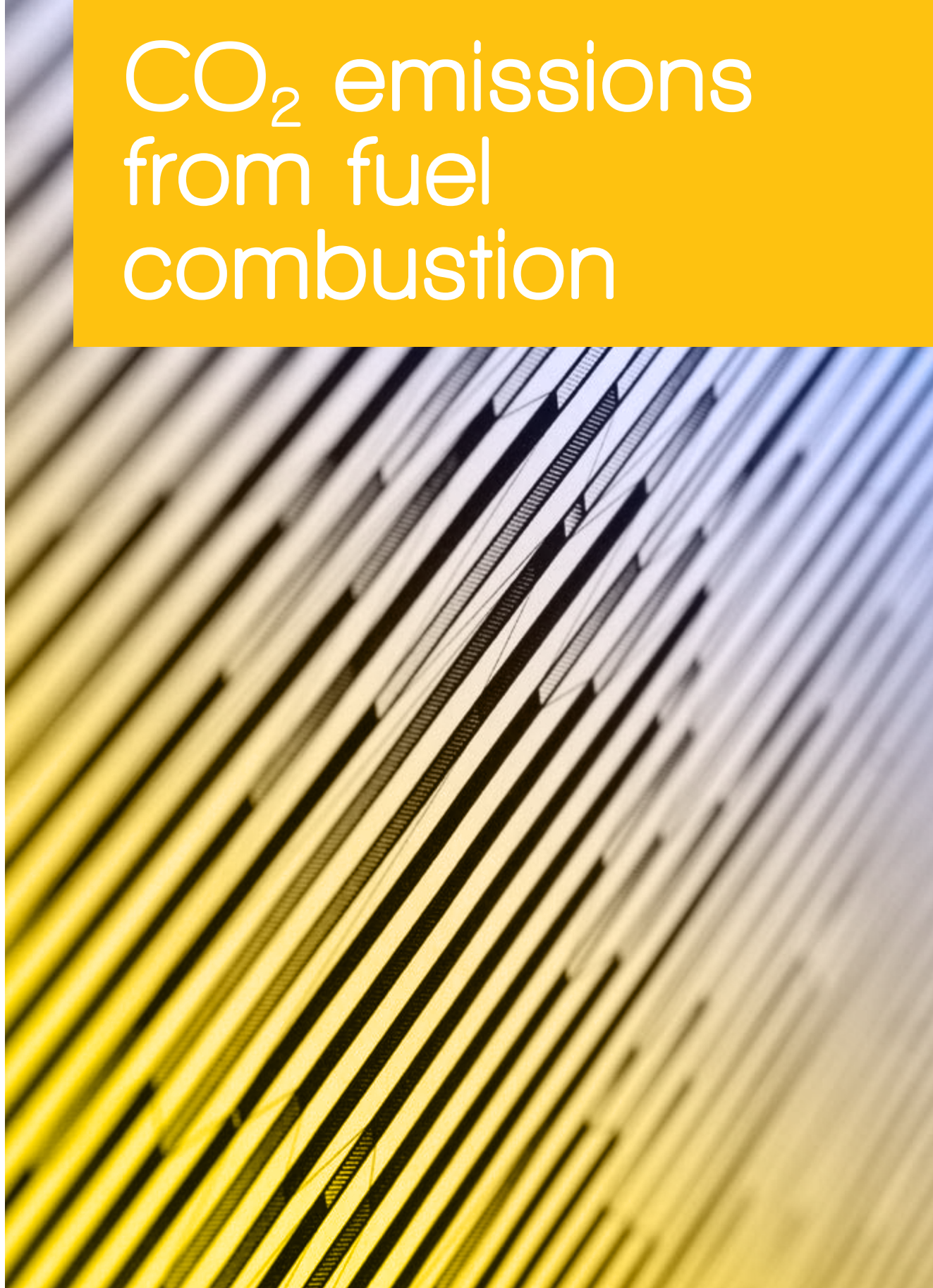


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CO₂ emissions from fuel combustion



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INTERNATIONAL ENERGY AGENCY

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- **Energy Security:** Promoting diversity, efficiency, flexibility and reliability for all fuels and energy sources;
- **Economic Development:** Supporting free markets to foster economic growth and eliminate energy poverty;
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FOREWORD

After remaining flat for three years, the IEA's first ever Global Energy and CO₂ Status Report – released in March 2018 – reported that global energy-related CO₂ emissions increased once again in 2017, reaching an all-time high. This sent a strong warning that current efforts to combat climate change are insufficient to meet the objectives of the Paris Agreement. Of course any effort to reduce emissions and meet climate objectives must fundamentally include the energy sector, as energy accounts for over two-thirds of total greenhouse gas emissions and more than 80% of CO₂ emissions.

For the energy sector, the increase in emissions in 2017 underlined the critical importance of tracking CO₂ emissions from fuel combustion; accurate data is ultimately the foundation of analysis and policy that will shape the energy sector for decades to come. To ensure this data is made available to policymakers and analysts alike, the IEA works with countries globally to improve reporting of energy data, ultimately resulting in more accurate estimations of CO₂ emissions. Based on official energy data for more than 150 countries worldwide and internationally agreed IPCC methodologies, this publication represents the most comprehensive set of estimates of CO₂ emissions from fuel combustion across the globe and all sectors of the economy.

It is my hope that in the lead-up to the UN climate negotiations at COP24 in Katowice, Poland, this latest information proves to be helpful for the participants and decision makers in the UNFCCC process. I also hope it assists other readers from all parts of the world to gain a better understanding of the evolution of emissions worldwide. Through publications such as this, the IEA will continue to provide accurate data to inform the policy debate and promote evidence-based policy recommendations on the complex, but critically important, relationship between energy and climate change.

Dr. Fatih Birol
Executive Director

What's new?

New IEA Member: Mexico

Mexico became the International Energy Agency's 30th member country on 17 February 2018. Accordingly, starting with the 2018 edition, Mexico appears in the list of IEA Members and is included in the IEA zone aggregates for data starting in 1971 and for the entire time series.

New Association country: Brazil

Brazil joined IEA as an Association country in October 2017. Accordingly, Brazil is now included in the IEA and Accession/Association countries aggregate for data starting in 1971 and for the entire time series.

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Kyoto Protocol base years

The year 1990 should be the base year for the estimation and reporting of inventories. According to the provisions of Article 4.6 of the Convention and Decisions 9/CP.2 and 11/CP.4, the following Annex I Parties that are undergoing the process of transition to a market economy, are allowed to use a base year or a period of years other than 1990, as follows:

Bulgaria:	to use 1988
Hungary:	to use the average of the years 1985 to 1987
Poland:	to use 1988
Romania:	to use 1989
Slovenia:	to use 1986

ABBREVIATIONS

Btu:	British thermal unit
BKB:	brown coal briquettes (braunkohlebriketts)
Gg:	gigagramme
GJ:	gigajoule
GtCO ₂ :	gigatonnes of carbon dioxide
GWh:	gigawatt hour
J:	joule
kcal:	kilocalorie
kg:	kilogramme
kt:	thousand tonnes
ktoe:	thousand tonnes of oil equivalent
kWh:	kilowatt hour
MJ:	megajoule
Mt:	million tonnes
MtCO ₂ :	million tonnes of carbon dioxide
Mtoe:	million tonnes of oil equivalent
m ³ :	cubic metre
PJ:	petajoule
t:	metric ton = tonne = 1 000 kg
tC:	tonne of carbon
Tcal:	teracalorie
TJ:	terajoule
toe:	tonne of oil equivalent = 10 ⁷ kcal
CC:	carbon content
CEF:	carbon emission factor
COF:	carbon oxidation factor
CHP:	combined heat and power
GCV:	gross calorific value
GDP:	gross domestic product
GWP:	global warming potential
NCV:	net calorific value
PPP:	purchasing power parity
TFC:	total final consumption
TPES:	total primary energy supply
CDM:	Clean Development Mechanism
COP:	Conference of the Parties to the Convention (see UNFCCC)
EITs:	Economies in Transition (refer to the chapter <i>Geographical coverage</i>)
G20:	Group of Twenty (refer to the chapter <i>Geographical coverage</i>)
IEA:	International Energy Agency
IPCC:	Intergovernmental Panel on Climate Change
OECD:	Organisation for Economic Co-operation and Development
UN:	United Nations
UNECE:	United Nations Economic Commission for Europe
UNFCCC:	United Nations Framework Convention on Climate Change
e	estimated
..	not available
-	nil
x	not applicable
+	growth greater than 1 000%

Important cautionary notes

The estimates of CO₂ emissions from fuel combustion presented in this publication are calculated using the IEA energy balances and the default methods and emission factors from the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. There are many reasons why **the IEA Secretariat estimates of CO₂ emissions from fuel combustion may not be the same as the figures that a country submits to the UNFCCC**, even if a country has accounted for all of its energy use and correctly applied the *IPCC Guidelines*.

In this publication, the IEA Secretariat presents CO₂ emissions from fuel combustion. IEA estimates include emissions from all reported energy use of fuels, but exclude emissions from non-energy use of fuels. Such totals may differ from those calculated using the Sectoral Approach of the *2006 IPCC Guidelines*, as under these guidelines some fuel combustion emissions have been reallocated out of the Source category energy and reclassified as industrial process emissions.

Information on “key sources” from fuel combustion, as developed in the *IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, are only given for combustion sources and will not include key sources from fugitive emissions, industrial processes, solvents, agriculture and waste. Please see the chapters *IEA emissions estimates* and *IPCC methodologies* for further information.

Energy data on OECD member and non-member countries¹ are collected by the Energy Data Centre (EDC) of the IEA Secretariat, headed by Mr. Duncan Millard. The IEA would like to thank and acknowledge the dedication and professionalism of the statisticians working on energy data in the respective countries.

Summary data for other greenhouse gases and sources are provided in cooperation with the PBL Netherlands Environmental Assessment Agency and the Joint Research Centre of the European Commission (JRC).

Mr. Francesco Mattion was responsible for the CO₂ emissions from fuel combustion estimates, and for the preparation of the publication. Input on international mitigation efforts was provided by Caroline Lee and Sara Moarif. Desktop publishing support was provided

by Ms. Sharon Burghgraeve. Ms. Roberta Quadrelli had overall responsibility for this publication.

CO₂ emission estimates from 1960 to 2016 for the Annex II countries and from 1971 to 2016 for all other countries are available on our online data service and on CD-ROM suitable for use on Windows-based systems. To order, please see the information provided at the end of this publication. Moreover, data can also be obtained on a pay-per-view basis. Details are available at www.iea.org/statistics.

Enquiries about data or methodology should be addressed to:

Energy Data Centre – CO₂ emissions
Telephone: (+33-1) 40-57-66-01
E-mail: emissions@iea.org

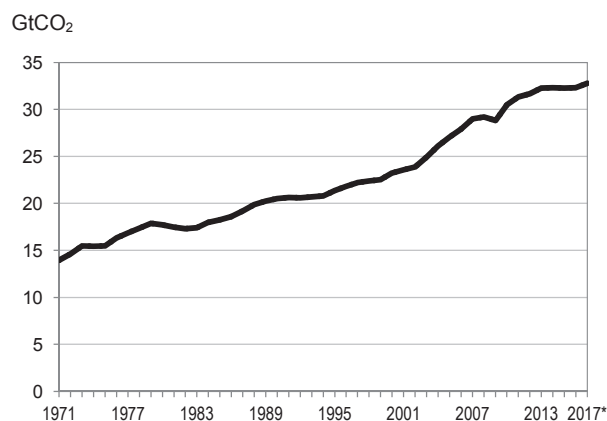
1. This document is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area. In this publication, “country” refers to a country or a territory, as the case may be.

CO₂ EMISSIONS: AN OVERVIEW

Stable global trends in the latest years

In 2016, global CO₂ emissions from fuel combustion were 32.31 GtCO₂, broadly similar to 2015 (32.28 GtCO₂). They have more than doubled since the early seventies and increased by around 40% since 2000, generally linked to increased economic output (Figure 1). Emissions exceeded 32 GtCO₂ in 2013 and were then rather stable for three consecutive years (2013 – 2016); however, initial IEA analysis¹ showed that in 2017 emissions increased by around 1.5%, led by China, India and the European Union.

Figure 1. CO₂ emissions from fuel combustion: global trend



Source: values up to 2016 are based on IEA (2018) - CO₂ emissions from fuel combustion. The value for 2017 is based on IEA (March 2018) - Global Energy & CO₂ Status Report.

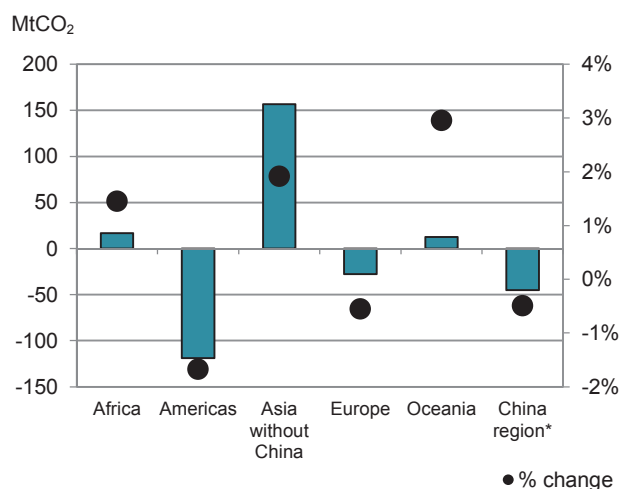
Between 2000 and 2013, global CO₂ emissions grew at the average annual rate of 2.6% mostly due to

1. As described in IEA (March 2018) - Global Energy & CO₂ Status Report.

China which in this period saw its emissions almost triple. However, the latest years for which full data are available showed a global flattening of emissions driven by contrasting regional trends (Figure 2). In particular, between 2015 and 2016:

- Emissions in China decreased by around 50 MtCO₂, following the trend begun in 2013.
- In the rest of Asia², emissions continued to increase at the average annual rate of 2%, mostly driven by India, Korea and Indonesia.
- The Americas (-2%) and Europe (-1%) showed a drop in emissions of 120 MtCO₂ and 30 MtCO₂ in the last year.

Figure 2. CO₂ emissions by region: 2016 change

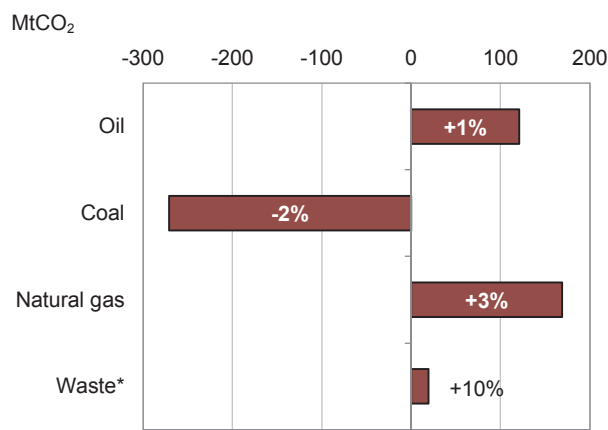


* China region includes Hong Kong, China

2. Here and in the following paragraphs, when referring to Africa, Americas, Asia, Europe and Oceania the official UN regional grouping definition was adopted. For more information about the geographical coverage please refer to: http://wds.iea.org/wds/pdf/Worldco2_Documentation.pdf

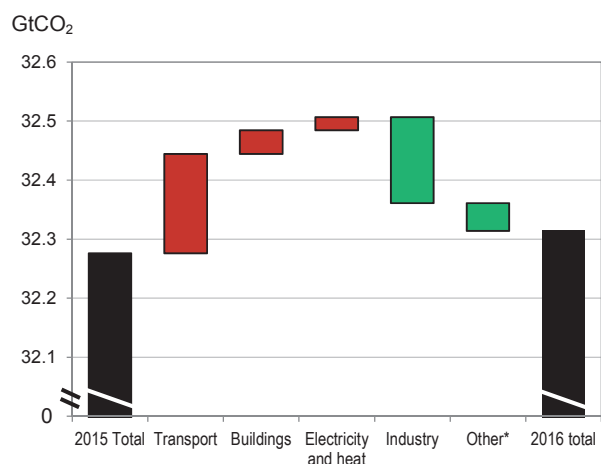
Also from a source perspective, contrasting trends can be highlighted for 2016 (Figure 3). Emissions from oil for transport and gas for electricity and heat generation grew by 120 MtCO₂ and 170 MtCO₂ respectively, with no major differences among regions. Whilst emissions by coal dropped by 270 MtCO₂ homogeneously in the Americas, Europe and China, increasing only in the rest of Asia (detailed analysis in paragraph “Oil and gas grow, coal decreases but is still the largest source of emissions”).

Figure 3. CO₂ emissions by source: 2016 change



* Waste includes industrial waste and the non-renewable part of municipal waste.

Figure 4. CO₂ emissions by sector: 2016 change



*Other here includes agriculture/forestry, fishing and other non-specified.

By sector, the decrease in emissions in industry (-2.3%) offset the increase of electricity and heat generation, transport and buildings together in 2016 (Figure 4). Key drivers have been:

- Decrease in coal consumption in the industrial sector by 50 Mtoe.

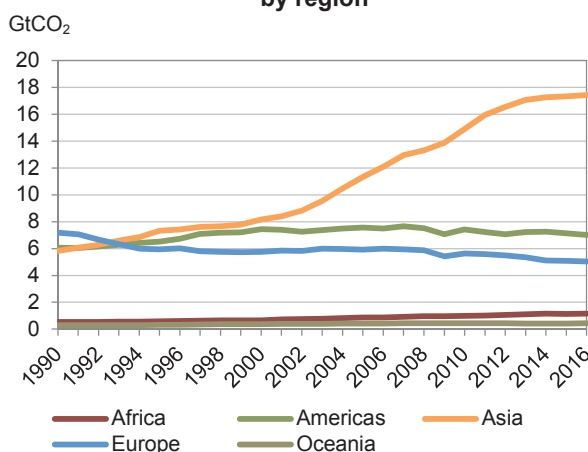
- Improvements in the electricity and heat mix and efficiencies of fossil generation that constrained the increase in demand and the consequent increase in emissions (for a focus on electricity see paragraph “Strong increase in electricity demand offsetting improvements in mix and efficiencies”)
- Increase in transport emissions which in 2016 grew by 2%, similarly to the years before.

Regional diverging trends

Global CO₂ emissions have been driven by different regional dynamics over time. The growth in emissions until 2000 was largely driven by Annex I countries³ and US in particular. More recently, since the 2000, Annex I countries have generally decreased their emissions (-10%) while emerging economies have generally seen increases with non-Annex I emissions more than doubling over this period.

Since the early 2000s, Asia dominated global trends, reaching 17.4 GtCO₂ in 2016, twice the level of the Americas and three times that of Europe (Figure 5). In Asia, China accounted for more than one half of the regional emissions in 2016 followed by India with 12% (Figure 6).

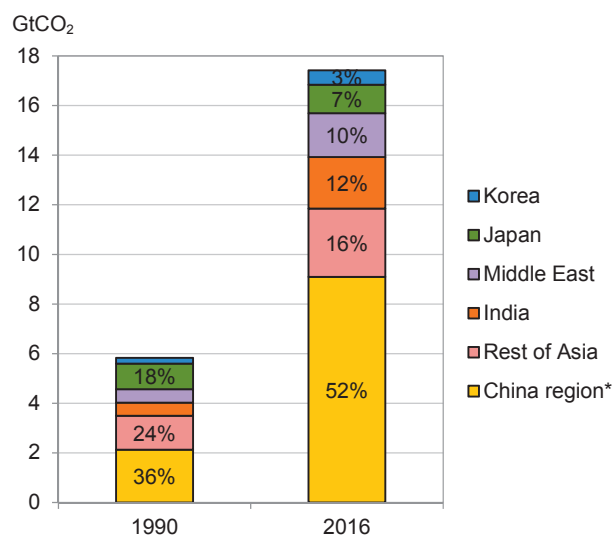
Figure 5. CO₂ emissions from fuel combustion: by region



Emissions in China grew at an average annual rate of 8.5% between 2000 and 2013 before remaining fairly stable in the following three years. Moreover, emissions in Asia continued growing, as Indian levels grew at an average annual pace of 5% since 2010. In 1990 Japan was the second largest source of

3. Here and in the following, when referring to Annex I and non-Annex I countries the UNFCCC regional grouping definition was adopted. For more information about the geographical coverage please refer to: http://wds.iea.org/wds/pdf/Worldco2_Documentation.pdf

Figure 6. CO₂ emissions from fuel combustion Asia



* China region includes Hong Kong, China

emissions in Asia, but its share has fallen from 18% to 7%, as emissions levels in 2016 were similar to those of 1990. For several other countries in the region, emissions also increased significantly since 2000, with Korea +36%, and Indonesia +78%. The Middle East region showed a particularly pronounced trend, with Iran +80% and Saudi Arabia 125%.

In Europe, emissions decreased by almost 12% since 2000; with pronounced decreases in the UK -29%, France -20%, Italy -23%, Spain -14% and Germany -10%. Emissions also decreased significantly in the US (-16%), although overall levels in the Americas showed little change as other major economies across the region increased their emission levels (Mexico +24%, Brazil +43%).

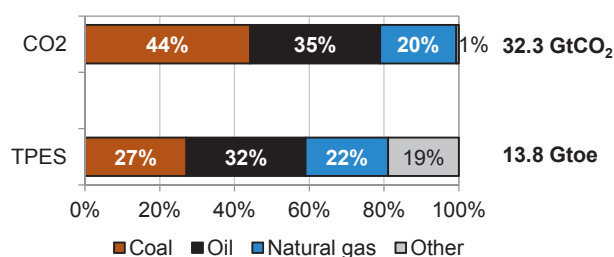
Over the same period, Africa maintained much lower levels, accounting for around 3.5% of global emissions in 2016, despite emissions doubling from 1990, passing the billion tons in 2012 – with South Africa dominating the totals (36% in 2016).

Oceania, accounted for about 1.5% of global totals, increasing by 53% since 1990, reaching in 2016 437 MtCO₂.

Oil and gas grow, coal decreases but is still the largest source of emissions

In 2016, the global intensity of the energy mix (CO₂/TPES) was 2.4 tCO₂/toe, comparable to the 1990 level. The average carbon intensity is generally driven by the relative weights of the various sources within the TPES (Figure 7).

Figure 7. TPES and CO₂ emissions - 2016

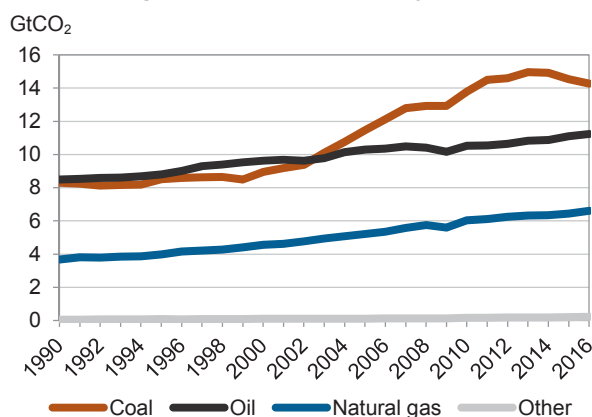


Globally, the fossil share of TPES, 81% in 2016, has remained stable since 1990. Over the period, coal and oil represented together around 60% of TPES and almost 80% of CO₂ emissions. Gas remained at around 20% of TPES, with non-emitting sources accounting for the rest (19% in 2016).

Coal was the second energy source (27%) in 2016 and, due to its heavy carbon intensity⁴, the largest source of emissions globally (44%).

Emissions from coal, strongly driven by China, saw a more pronounced growth in emissions (4% per year) than those of the other fossil fuels between 2000 and 2013; then, they decreased by around 1.5% per year between 2013 and 2016. Emissions from oil and gas had smoother growth trends over time, continuing to increase after 2013 (+4% and +5% respectively, in three years), especially in Asia and America - mostly linked to the raising demand of oil for transport and gas for electricity production (Figure 8).

Figure 8. CO₂ emissions by source

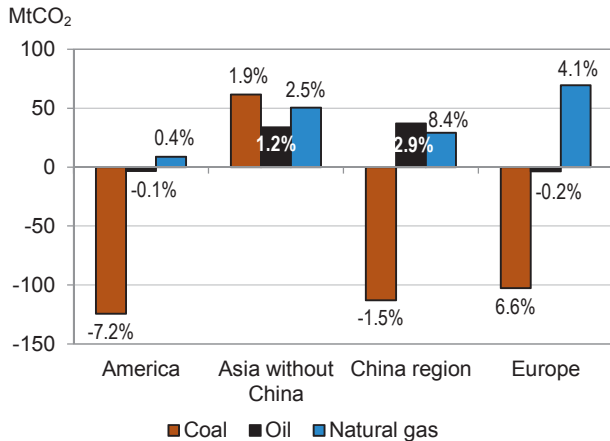


In 2016, coal emissions decreased by almost 300 MtCO₂ globally, with large falls across the Americas, China and Europe: decreases included UK (-49%), Spain and Italy (-11%), the US (-7%), Germany (-5%) and

4. Default carbon emission factors from the 2006 IPCC Guidelines: 15.3 tC/TJ for gas, 15.7 to 26.6 tC/TJ for oil products, 25.8 to 29.1 tC/TJ for primary coals.

China (1.5%, equivalent to more than 110 million tons). However, several Asian countries increased their emissions from coal including: Indonesia +6%, Philippines +13%, India +1% (Figure 9).

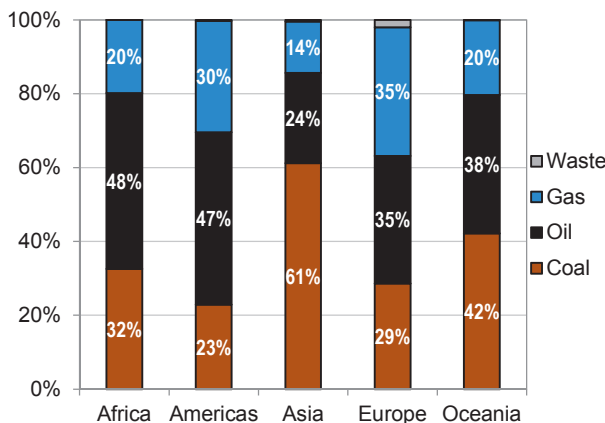
Figure 9. CO₂ emissions by source: 2016 change in selected regions



In 2016, emissions from gas grew across all regions by 170 MtCO₂, and emissions from oil increased by 120 MtCO₂ (+1%) globally, mainly driven by countries across Asia.

In 2016, coal accounted for over 60% emissions in Asia; oil accounted for almost half the emissions in America and Africa. In Europe, coal, oil and gas almost equally contributed to the total (Figure 10).

Figure 10. CO₂ emissions by source for selected regions, 2016

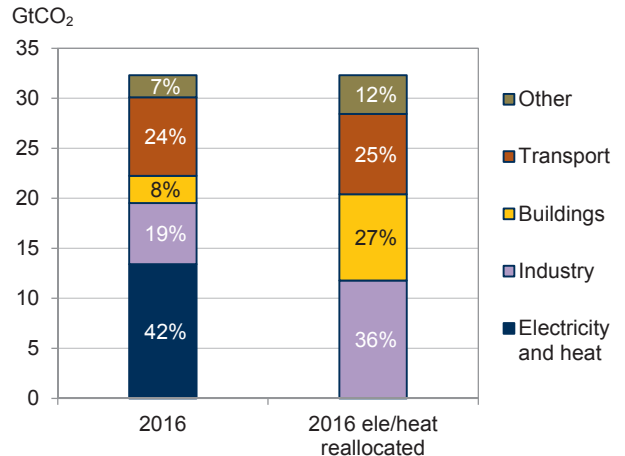


Electricity and heat generation remains the most emitting sector

In 2016, the largest emitting sector overall was electricity and heat generation, accounting for 42% of global emissions; five percentage points higher than 1990. When allocating emissions from electricity to

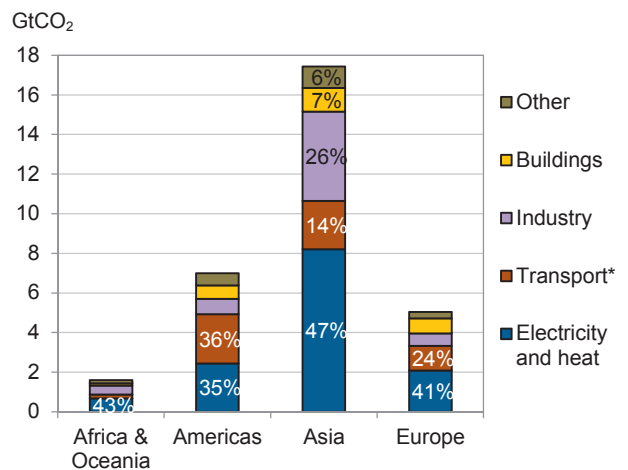
consuming sectors⁵, industry was the largest emitter, with 36%, or 12 billion tons of CO₂; followed by buildings – whose share increased from 8% to 27% due to its strong reliance on electricity - and then transport, not significantly impacted by electricity emissions (Figure 11).

Figure 11. Global CO₂ emissions by sector, 2016



In 2016, nearly one quarter of global emissions were generated in Asia from electricity and heat generation - an amount comparable to the sum of total emissions of Europe (including Russia), Africa and Oceania put together (Figure 12). For electricity and heat generation more than 60% of global emissions were produced in Asia, for industry more than 70%.

Figure 12. CO₂ emissions by sector for selected regions, 2016

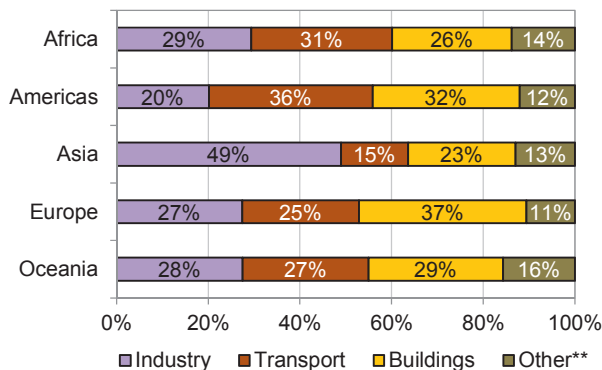


* At the regional level, transport does not include international marine and aviation bunkers.

5. Emissions from electricity and heat generation have been allocated to the consuming sectors in proportion to the electricity and heat consumed.

After allocating electricity and heat emissions across sectors, industry accounted for one half of Asian emissions (8.5 GtCO₂) in 2016. In the Americas, transport was the largest emitting sector, accounting for 36% of total emissions, but reaching 48% in Brazil. In Europe, buildings accounted for 37% of emissions, 1.8 GtCO₂ (Figure 13).

Figure 13. CO₂ emissions by sector* for selected regions, 2016



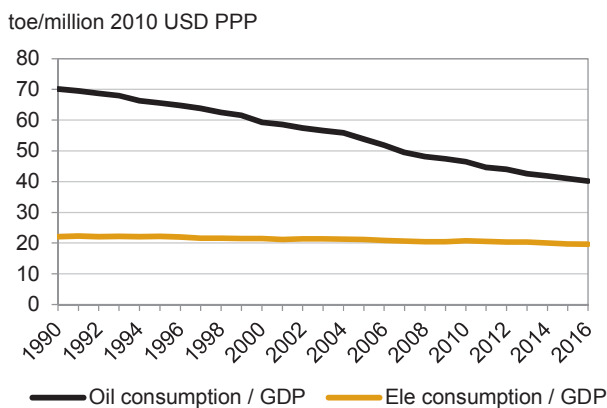
* After allocation of emissions from electricity and heat generation to consuming sectors.

** Other here includes agriculture/forestry, fishing and other non-specified.

Strong increase in electricity demand offsetting improvements in mix and efficiencies

At a global level, electricity consumption more than doubled since 1990, reaching 25 PWh in 2016. In terms of economic intensity, electricity consumption per unit of GDP decreased by around half percent annually, as opposed for example to oil, whose intensity declined at an annual rate of 2.4%, implying a stronger decoupling of the economy (Figure 14).

Figure 14. Oil and electricity intensities



At the sectoral level, the industry and buildings sectors doubled their electricity consumption since 1990 but maintained comparable levels of oil consumption.

However, oil consumption in 2016 (4.4 Gtoe) was two times larger than electricity.

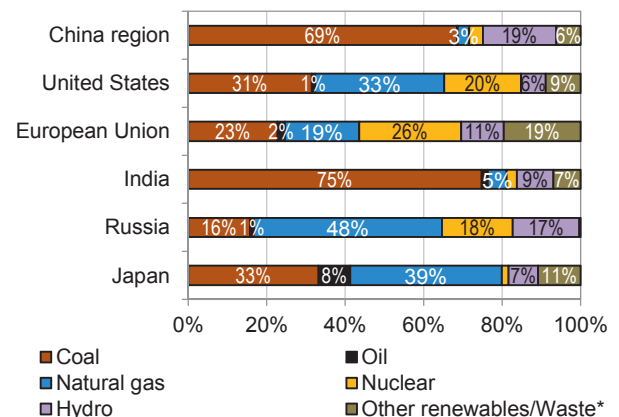
In 2016, the largest six generating countries produced 70% of total electricity and accounted for 73% of emissions.

With shares of electricity from coal of 69% and 75%, China and India together produced 40% of the global emissions from electricity generation – 12.2 GtCO₂, with US, EU, Russia and Japan accounting for the 32%. Gas dominated the mix for Russia but was also significant for Japan and the US; with shares lower than five percent, it remained low in China and India (Figure 15).

Electricity from renewables⁶ was higher than 15% for all the top producers, and particularly large in the European Union and China. Renewable sources besides hydro accounted for around 8% of total production, with great variability among regions.

In 2016 nuclear contributed for 12% of electricity generation for the top producers, and for 10% globally.

Figure 15. Electricity generation by source for selected countries, 2016



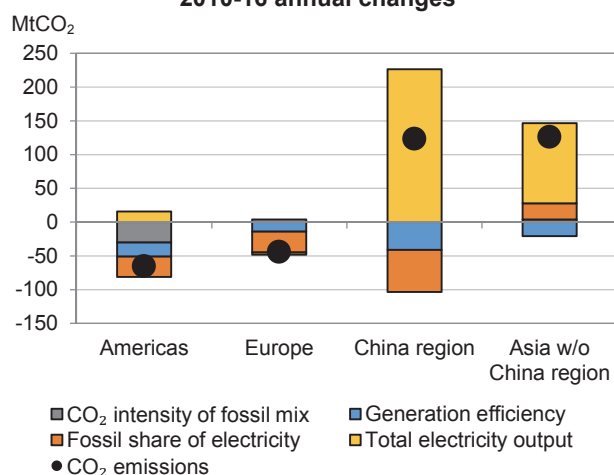
* Other renewables/Waste includes: geothermal, solar, wind, tide/wave/ocean, biofuels and waste.

Between 2010 and 2016, while global electricity production grew by 16% (3.5 PWh), emissions grew by 7% thanks to improvements in the fossil generation efficiencies and increases in renewable generation.

In China, increases in renewables share in the mix (+34%) and in efficiencies of fossil generation (+7%) helped offset the increase of demand (+47%), and thus contained the growth in emissions to +23%, or 730 million tons over the period 2010-16 (Figure 16).

6. Renewables includes: hydro, geothermal, solar, wind, tide/wave/ocean, and biofuels.

Figure 16. Drivers of electricity CO₂ emissions: 2010-16 annual changes



In both the Americas and Europe, similar improvements led to overall emission reductions, as electricity demand was fairly stable.

In the rest of Asia, CO₂ emissions from electricity generation increased across major countries: for example in Japan, while electricity demand remained almost flat, fossil generation increased up to over 80% after the Fukushima disaster; in India and Korea, the mix remained rather stable but demand increased by 500 TWh and 60 TWh.

Around three quarters of emissions in industry from Asia

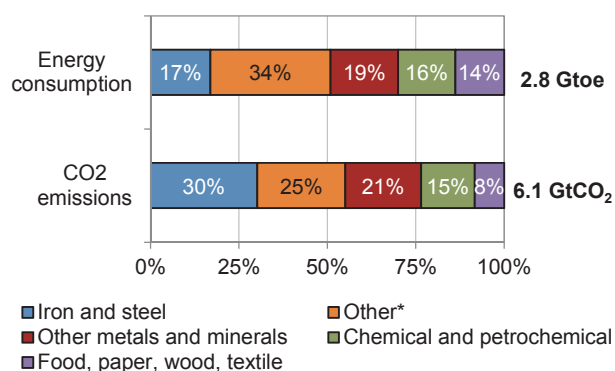
The industry sector accounted for more than 6 GtCO₂ in 2016, 19% of global emissions. Metals and minerals accounted for more than one third of industrial energy consumption and more than a half of emissions - due to their heavy reliance on coal. Between 2000 and 2016, energy consumption of the iron and steel sector increased by 80% (200 Mtoe), while emissions almost doubled, reaching 1.8 GtCO₂ (Figure 17).

At the regional level, the Americas and Europe saw falls in energy consumption by industry (by 8% and 13%), while Asia more than doubled. China itself accounted for around 1 Gtoe in 2016, equal to the sum of the combined industrial consumption of Europe, Americas, Oceania and Africa (Figure 18).

In the metal and minerals sectors, China and India together represented 60% of the global consumption, producing around 2.2 GtCO₂ emissions.

While consumption in the chemical and petrochemical sector was homogeneously distributed across the regions, the Americas represented more than one third

Figure 17. Industry: consumption and CO₂ emissions, 2016

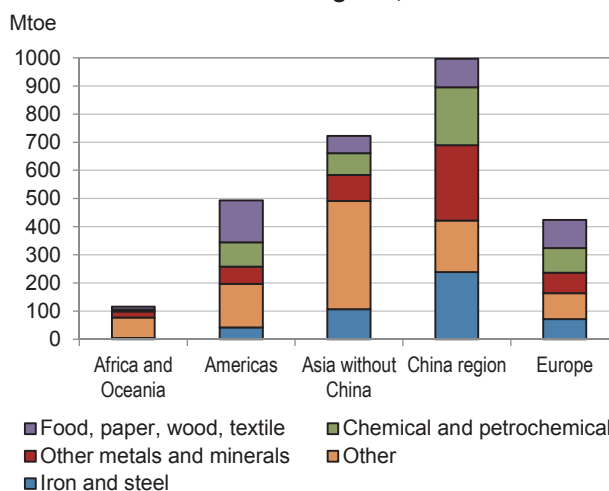


*Other includes mining and quarrying, transport equipment, machinery, construction and industry non-specified.

of global food industry consumption and almost one half of that of paper. In Europe, sub-sectoral shares were comparable, at around 15%.

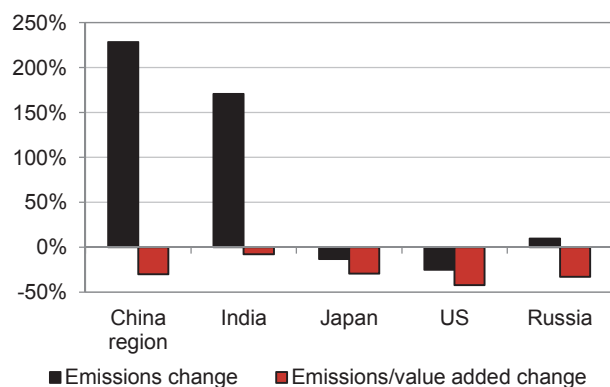
Between 2000 and 2015 global industrial emissions increased by almost 2.4 GtCO₂ but intensities overall decreased by 3% in the same period with a peak in 2011.

Figure 18. Industry consumption by sector for selected regions, 2016



China's emissions in the industrial sector more than tripled between 2000 and 2015 pushed by nearly 900 MtCO₂ increase in the iron and steel sector, but emissions per unit of value added in industry decreased by 30%, (Figure 19).

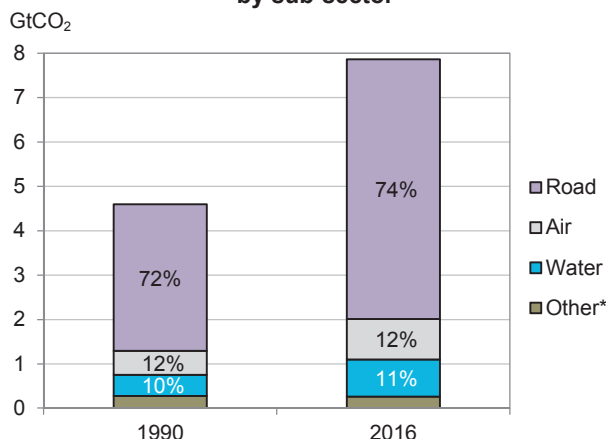
In the same period India's industrial emissions increased by 320 MtCO₂ whilst its intensity decreased by 7%. In US and Japan, industrial emissions dropped (140 MtCO₂ and 30 MtCO₂) whilst value added increased thus causing intensities to decline by around 40% and 30%.

Figure 19. Emissions and intensity* for the largest industry emitters: 2000 – 2015 changes


*Based on value added in 2010 USD. Emissions data from: IEA (2017) – CO₂ emissions from fuel combustion; value added data from UNIDO – International Yearbook of Industrial Statistics.

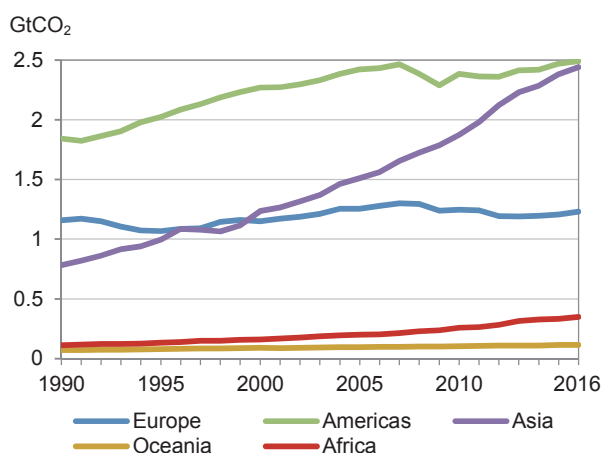
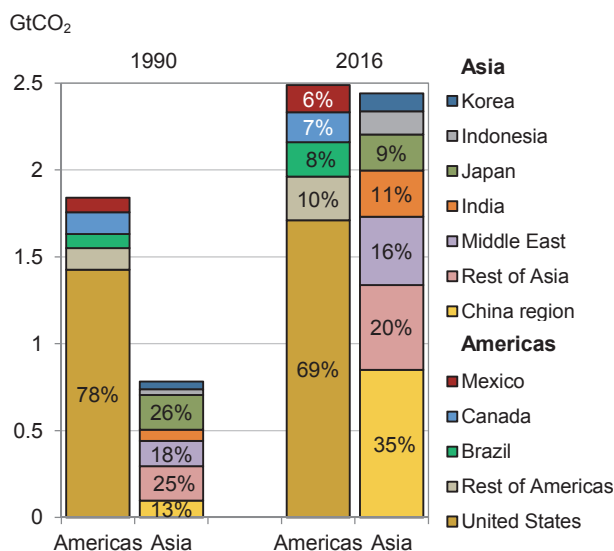
Fast growing transport

Globally, transport accounted for one fourth of total emissions in 2016, around 8 GtCO₂, 71% larger than in 1990. The highest absolute increase was in road, +2.5 GtCO₂, although in relative terms bunkers increased the most, +84% for navigation and +115% for aviation. Overall, the share of road transport emissions increased by two percentage points to 74%, while air and water remained unchanged (Figure 20).

Figure 20. Global transport CO₂ emissions by sub-sector


* Other includes rail, pipeline and other non-specified. Air and water include international bunkers.

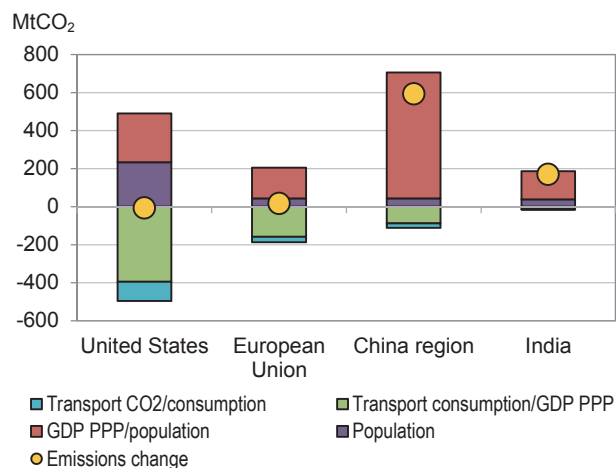
The Americas historically had the highest transport emission levels of all regions, and - although at a reduced rate - continued growing over recent years (Figure 21). Since 1990, US accounts for more than two thirds of transport emissions for the Americas though its share declined over time. In 2016 Brazil reached a share of 8% after more than doubling its transport emissions since 1990 (Figure 22).

Figure 21. Transport CO₂ emissions by region

Figure 22. Transport CO₂ emissions – selected countries in the Americas and Asia


Asia – with annual growth rates five times larger than the Americas (4.5% versus 0.7%) – reached comparable levels in 2016 (around 2.5 GtCO₂), starting from less than half in 1990. In 2016, transport emissions in China (0.8 GtCO₂) were half those of the US, representing 35% of transport emissions in Asia. India had a share of 11% of transport emissions in Asia in 2016, Japan 9%, decreasing by 15 percentage points since 1990.

In Europe, transport emissions in 2016 were 6% larger than in 1990, with 0.5% annual growth between 2012 and 2016. Africa almost tripled its transport emissions since 1990, although in 2016 levels were lower than 400 MtCO₂. Oceania in the same period increased by 60%, reaching 1015 MtCO₂.

Figure 23. Drivers for transport CO₂ emissions for selected countries, 2000 – 2016



Between 2000 and 2016 the largest increase in transport emissions globally was in China – tightly linked to GDP growth (Figure 23). The average annual growth of 9% in per capita GDP since 2000 was the main driver for the 600 MtCO₂ emissions growth.

In the US, while population (+15%) and GDP (+33%) increased, transport emissions stayed almost flat thanks to the improvements in intensity on GDP (-21%) and carbon intensity of the energy mix (-6%) mostly due to an increased share of biofuels.

A possible decoupling, great inequalities though

When considering all economic activities together, decoupling between total emissions and GDP was particularly significant since 2013 (Figure 24). The combined effects of carbon intensity of the energy mix (-2%) and intensity of GDP (-7%) helped emissions remain flat despite growth in economy and population.

In 2016, global emissions per capita were 4.3 tCO₂, +14% than in 2000 (Figure 25).

Per capita emissions in China more than doubled, reaching values similar to European Union. While population grew by less than 10%, total CO₂ emissions almost tripled. While between 2000 and 2016

Figure 24. Global CO₂ emissions: drivers

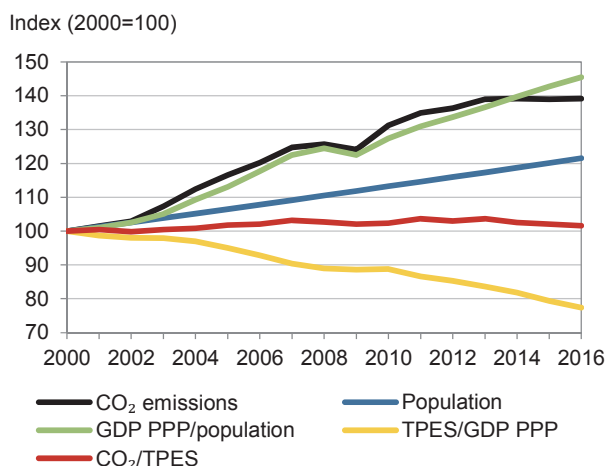
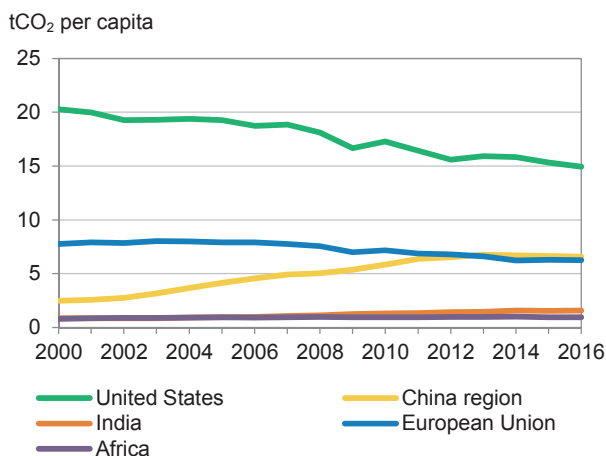


Figure 25. Per capita CO₂ emissions for selected regions



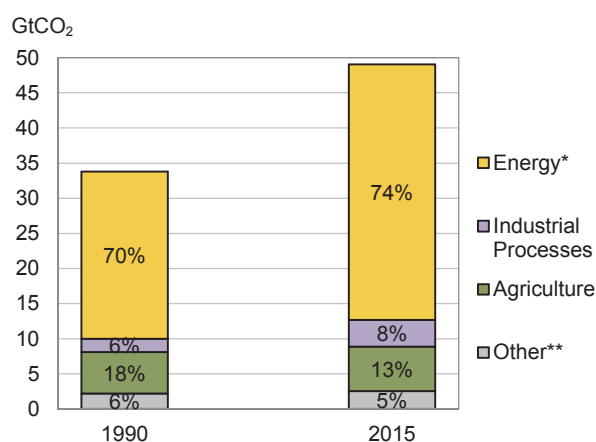
India doubled the emissions, its per capita value was still one quarter of European Union in 2016. Flat since 2000, Africa had the lowest per capita emissions among all regions, around one tenth of those of the US.

Should Africa, Asia and Americas averagely reach comparable levels of emissions per capita as the European Union, an additional 13 Gt CO₂, or around two-fifths of global CO₂ emissions, would be emitted in 2016.

Energy as a key driver for emissions

Driven by CO₂ emissions from fuel combustion, energy-related GHG emissions increased by 12.6 GtCO₂, and also as a percentage of total GHG emissions, between 1990 and 2015 with the other GHG sources (industrial processes, agriculture and other) together increasing by 2.7 GtCO₂ (Figure 26).

Figure 26. Global anthropogenic GHG emissions



* Energy includes IPCC categories Fuel Combustion and Fugitive.

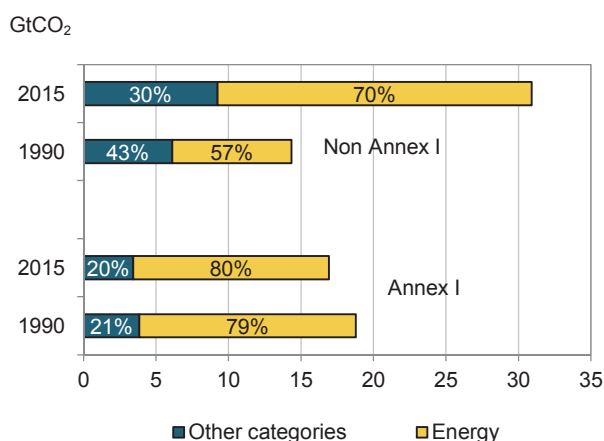
** Other includes large-scale biomass burning (excluding CO₂), post-burn decay, peat decay, indirect N₂O emissions from non-agricultural emissions of NO_x and NH₃, Waste, and Solvent Use.

Source: based on IEA estimates for CO₂ from fuel combustion and EDGAR version 4.3.2FT2016 for CO₂, CH₄ and N₂O emissions and 4.2FT2010 for the F-gases; based on 100-year Global Warming Potential (GWP), see Part III.

The share of energy-related emissions in the total GHG emissions grew mostly due to non-Annex I countries increasing their energy consumption, with energy-related emissions growing from 57% to 70% of total GHG emissions in 2015, after more than doubling (Figure 27).

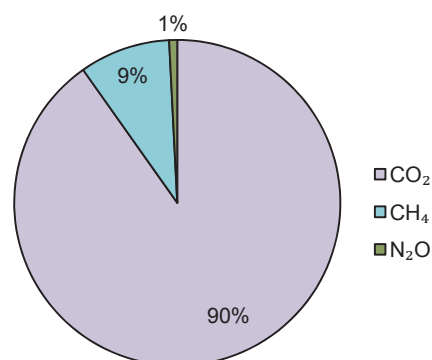
In the same period, Annex I countries reduced total GHGs by around 10% across both energy and other sources.

Figure 27. GHG emissions – energy and other sources



As around 90% of energy-related emissions derived from the oxidation of carbon, CO₂ was the largest source of GHG emissions for the energy category (Figure 28).

Figure 28. Energy emissions by source



CO₂ emissions from fuel combustion, represented over two thirds of total GHG emissions in 2015, with four percentage points more than in 1990. Thus, they remain at the core of climate change mitigation debate and represent one of the main issues to address in the broader political agenda.

Developing a low-carbon world

With the energy sector accounting for around three quarters of global greenhouse gas (GHG) emissions, action in the energy sector can make or break efforts to achieve global climate goals. Traditionally, industrialised countries have emitted the large majority of anthropogenic GHGs. In 2007, shares of emissions from non-Annex I countries surpassed those of Annex I countries, and have kept rising very rapidly (Figure 27). To shift towards a low-carbon world, mitigation efforts must occur across all countries and target both energy supply and demand.

The Paris Agreement: International action beyond 2020

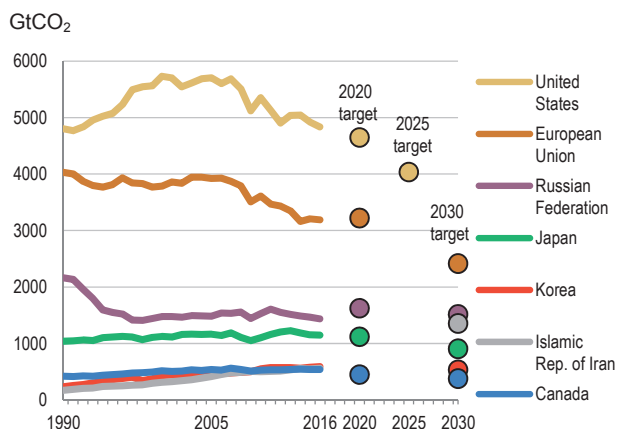
The global community adopted the historic Paris Agreement in December 2015, which includes GHG mitigation actions covering the time period from 2020 onward. It is the first international climate agreement to extend mitigation obligations to all countries, both developed and developing.

The long-term goals of the Paris Agreement are ambitious: to limit temperature rise to “well below 2°C above pre-industrial levels” and pursue efforts to limit the rise to 1.5°C. To achieve these goals, countries “aim to reach global peaking of GHG emissions as soon as possible” and “to undertake rapid reductions thereafter” to “achieve a balance between anthropogenic emissions by sources and removals by sinks of GHGs in the second half of this century,” equating essentially to achieving net-zero emissions by this time.

The Agreement was ratified in record pace and came into force 4 November 2016. As of 29 August 2018, there are 197 signatories to the Paris Agreement of which 180 have also formally joined or ratified the agreement (UNFCCC, 2018).

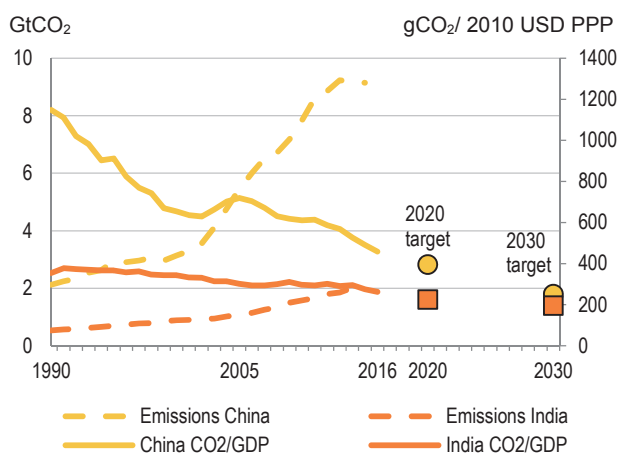
The Paris Agreement is founded on Nationally Determined Contributions (NDCs) made by countries, which are intended outline their “highest possible ambition” to address climate change including reducing GHG emissions. NDCs are updated every five years, and each new NDC is to represent a progression from the previous one. Current NDCs cover the period from 2020 to 2030 or 2025, and most include quantitative emissions reductions targets, summarized in Table 1 and Figure 29 (A and B) for the top-ten emitting countries

Figure 29 A. Historical CO₂ emissions (1990-2016) and emissions reduction targets (2020, 2025, 2030) for the top ten emitting Parties, excluding China and India



Notes: The United States, the Russian Federation and the Islamic Republic of Iran have set emission reduction targets within a specified range (Table 1). Only the most ambitious ends of the targets are indicated in the graph. Korea has a target for 2030 only. Saudi Arabia has a target to achieve “annual mitigation co-benefits” of “up to 130 million tons of CO₂eq by 2030,” not indicated on the graph. Historical emissions are indicated using MtCO₂, while numerous emissions targets use CO₂-equivalent (Table 1). China and India are excluded from this graph as these countries have specified emission intensity targets (see Figure 29B).

Figure 29 B. Historical CO₂ emissions (1990-2016) and emission-intensity reduction targets (2020, 2030) for China and India, 1990-2016



Notes: Intensity targets for India and China are specified within a range for both 2020 and 2030 (Table 1). Only the most ambitious target levels are indicated in the graph. India’s targets use CO₂-equivalent (CO₂e)/GDP, so the target levels indicated on the graph may not reflect the full range of GHGs covered by the targets.

and remaining IEA member countries. Countries that have submitted an NDC represent over 96% of global CO₂ emissions (World Resources Institute, 2018).

Since the Agreement’s adoption and entry into force, countries have shifted their focus to implementing their commitments under the accord, such as negotiating

a “rulebook”, which includes rules and guidelines for emissions accounting and transparency of mitigation action and financial support. The negotiation of this “rulebook” is to be finalised by the end of COP24 in Katowice Poland, in December 2018.

Pre-2020 action

The first binding commitments to reduce greenhouse gas emissions were set under the Kyoto Protocol’s first commitment period (2008-12), requiring participating industrialised countries (as a group) to curb emissions by about 5% relative to 1990 over this period. Thirty-eight Parties also agreed to take commitments under a second commitment period (2013-2020) set out by the Doha Amendment to the Kyoto Protocol; however, the Amendment has not reached its ratification threshold. Furthermore, despite its extensive participation (192 Parties), the Kyoto Protocol second commitment period targets cover only around 13% of global CO₂ energy-related emissions in 2016.

Alongside agreement of a second Kyoto Protocol commitment period, developed and developing countries submitted voluntary emission reduction pledges for 2020 under the Copenhagen Accord and Cancún Agreements, with the participating Parties producing over 80% of global GHG emissions (Table 1; Figure 29A and B). Although the ambition of these pledges is more limited compared with targets laid out in NDCs, this marked a significant improvement in the coverage of countries taking action to address GHG emissions,

compared with the Kyoto Protocol, and laid the groundwork for the Paris Agreement.

Timely and accurate CO₂ and GHG statistics (complemented by other metrics to assess underlying transformation of the energy system) are central to measuring achievement of climate targets and drive further ambition, both at the international and national levels. The IEA continues to support countries through provision of energy and emissions statistics, and training country officials in policy, modelling, and energy statistics. The IEA’s Clean Energy Transitions Programme enhances efforts to help countries – with a focus on key emerging countries including IEA Association and Partner countries – better collect, use, and communicate robust energy and emissions data.

References

- IEA (2018), *World energy balances*, OECD/IEA, Paris. EDGAR version 4.3.2_FT2016 for CO₂, version 4.4 for CH₄ and N₂O emissions and 4.2FT2010 for the F-gases.
- United Nations Framework Convention on Climate Change (2018). Paris Agreement – Status of Ratification, <https://unfccc.int/process/the-paris-agreement/status-of-ratification>
- World Resources Institute (2018). CAIT Climate Data Explorer, <http://cait.wri.org/>.

Table 1. Greenhouse gas reduction targets of the ten largest emitters (based on 2016) emissions and IEA member countries

Ten highest emitting Parties (as per IEA estimates of CO ₂ emissions from fuel combustion in 2016)	1990	2005	2016	2020 GHG target	Base year level	2016 level	% change to 2016	NDC GHG target ¹
	MtCO ₂							
China (incl. Hong Kong)	2 122	5 448	9 102	emissions/GDP 40-45% below 2005	0.72 kgCO ₂ / 2010 USD PPP	0.46 kgCO ₂ / 2010 USD PPP	-36%	Reduce CO ₂ per unit of GDP by 60-65% below 2005
United States ²	4 803	5 703	4 833	17% below 2005	5 703 Mt	4 883 Mt	-15%	26-28% reduction by 2025 below 2005 levels
European Union	4 027	3 922	3 192	20% below 1990 ³	4 027 Mt	3 192 Mt	-21%	40% reduction compared to 1990 levels
India	529	1 072	2 077	emissions/GDP 20-25% below 2005 ⁴	0.30kgCO ₂ / 2010 USD PPP	0.26 kgCO ₂ / 2010 USD PPP	-13%	Emissions/GDP 33-35% below 2005 levels ⁵
Russian Federation	2 164	1 482	1 439	15-25% below 1990	2 164 Mt	1 439 Mt	-34%	25-30% below 1990 levels ⁶
Japan	1 037	1 164	1 147	3.8% below 2005	1 164 Mt	1 147 Mt	-6%	26% below 2013 levels ⁷
Republic of Korea (Korea)	232	458	589	None ⁸		589 Mt		37% below BAU emissions of 850.6 MtCO ₂ e in 2030 ⁹
Islamic Republic of Iran (Iran)	171	418	563	None		x		4% below BAU of 1540 Mt CO ₂ in 2030; 12% with international support ¹⁰
Canada	420	540	541	17% below 2005	540 Mt	541 Mt	+0%	30% below 2005 levels
Saudi Arabia	151	298	527	None		X		Annual GHG-emission abatement of up to 130 MtCO ₂ e
Other IEA member countries								
	1990	2005	2016	2020 GHG target	base year level	2016 level	change % to 2016	
	MtCO ₂							
Australia	260	372	392	5% below 2000 levels	335 Mt	392 Mt	+17%	26-28% below 2005 levels
New Zealand	22	34	30	5% below 1990 levels	22 Mt	30 Mt	+40%	30% below 2005 levels
Norway	27	35	36	40% below 1990 ¹¹	27 Mt	36 Mt	+29%	40% below 1990 levels
Switzerland	41	44	38	20% below 1990 ¹²	41 Mt	38 Mt	-7%	50% below 1990 levels. 35% anticipated reduction by 2025
Turkey	129	216	339	None				21% emission reduction below BAU of 1175 MtCO ₂ e ¹³
Mexico	257	412	445	30% below BAU scenario.	906 MtCO ₂ e (2020 BAU)	445Mt	51% below BAU 2020 level	22% below BAU ¹⁴

1. Targets are for the year 2030 and include total GHG reduction targets unless otherwise specified.

2. US: The United States announced on 1 June 2017 its intention to withdraw from the Paris Agreement.

3. EU 2020: The EU's 2020 target excludes LULUCF (included in 2030 target)

4. India's 2020 target excludes emissions from agriculture

5. India's 2030 NDC also includes mitigation of 2.5-3 GtCO₂e by 2030 through carbon sequestration.

6. Based on Russia's intended nationally determined contribution (INDC).

7. Japan's 2030 target includes overseas credits.

8. In 2016, Korea replaced its 2020 target of 30% below business-as-usual with a 2030 target as defined in its NDC.

9. It is still to be decided by the Korean government whether LULUCF will be included in the 2030 target.

10. Target based on INDC and 2030 BAU emissions level from Iran's 2015 Third National Communication to UNFCCC.

11. Norway sets a minimum 16% reduction for any given year during 2013-2020 under the Kyoto Protocol second commitment period.

12. Switzerland sets a minimum 15.8% reduction for any given year during 2013-2020 under the Kyoto Protocol second commitment period.

13. Based on Turkey's INDC.

14. Mexico's 2030 target consists of a 22% GHG reduction and 51% reduction in black carbon, which together would result in a 25% emission reduction compared to its BAU scenario. Mexico aims to peak emissions in 2026 while reducing emission intensity by 40% between 2013 and 2030 (based on NDC).

PART I

METHODOLOGY

1. UNDERSTANDING THE IEA CO₂ EMISSIONS ESTIMATES

The importance of estimating emissions

The ultimate objective of the UNFCCC (the Convention) is the stabilisation of GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The Convention also calls for all Parties to commit themselves to the following objectives:

- to develop, update periodically, publish and make available to the Conference of the Parties (COP) their national inventories of anthropogenic emissions by sources and removals by sinks, of all greenhouse gases not controlled by the Montreal Protocol.
- to use comparable methodologies for inventories of GHG emissions and removals, to be agreed upon by the COP.

As a response to the objectives of the UNFCCC, the IEA Secretariat, together with the IPCC, the OECD and numerous international experts, has helped to develop and refine an internationally-agreed methodology for the calculation and reporting of national GHG emissions from fuel combustion. This methodology was published in 1995 in the *IPCC Guidelines for National Greenhouse Gas Inventories*. After the initial dissemination of the methodology, revisions were added to several chapters, and published as the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (1996 GLs)*. In April 2006, the IPCC approved the *2006 IPCC Guidelines for National Greenhouse Gas Inventories (2006 GLs)* at the 25th session of the IPCC in Mauritius. Until 2015, most Parties, as well as the IEA, still calculated their inventories using the

1996 GLs. In December 2011, Parties adopted Decision 15/CP.17 to update their reporting tables so as to implement the *2006 GLs*. The new reporting tables have been mandatory since 15 April 2015.

The IEA estimates of CO₂ emissions from fuel combustion

Energy is at the core of the greenhouse gas estimation. It is estimated that for Annex I Parties energy accounts for 82%¹ of total GHG emissions, while for the world the share is over two thirds, although shares vary greatly by country. Within energy, CO₂ from fuel combustion accounts for the largest fraction, 92% for Annex I countries, once again varying depending on the economic structure of the country.

Given its extensive work in global energy data collection and compilation, the IEA is able to produce comparable estimates of CO₂ emissions from fuel combustion across countries and regions, providing a reference database for countries with more and less advanced national systems.

The estimates of CO₂ emissions from fuel combustion presented in this publication are calculated using the IEA energy data² and the default methods and emission factors from the *2006 GLs*³.

1. Based on data reported to the UNFCCC for 2012, excluding land-use, land-use change and forestry (LULUCF).

2. Published in *World Energy Statistics and World Energy Balances*, OECD/IEA, Paris, 2016.

3. See www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html.

Prior to the 2015 edition of this publication, the IEA used the methods and emission factors of the *Revised 1996 IPCC Guidelines*, in line with UNFCCC recommendations for the reporting under the Kyoto Protocol. The IEA implementation of the *2006 GLs* in this edition follows the decision of UNFCCC Parties to update their reporting tables and to implement the *2006 GLs* starting on 15 April 2015.

The implications of changes in methods and emissions factors on the IEA emissions estimates for this edition are discussed in the chapter *IEA estimates: Changes under the 2006 IPCC Guidelines*.

Data in this publication and its corresponding database may have been revised with respect to previous editions also because the IEA reviews its energy databases each year. In the light of new assessments, revisions may be made to the energy data time series for any individual country.

CO₂ emissions from fuel combustion: key concepts

The IEA uses the simplest (Tier 1) methodology to estimate CO₂ emissions from fuel combustion based on the *2006 GLs*. The computation follows the concept of conservation of carbon, from the fuel combusted into CO₂. While for the complete methodology the reader should refer to the full IPCC documents, a basic description follows.

Generally, the Tier 1 estimation of CO₂ emissions from fuel combustion for a given fuel can be summarised as follows:

$$\text{CO}_2 \text{ emissions from fuel combustion} \\ \text{CO}_2 = \text{Fuel consumption} * \text{Emission factor}$$

where:

Fuel consumption = amount of fuel combusted;
Emission factor = default emission factor

Emissions are then summed across all fuels and all sectors of consumption to obtain national totals. A more detailed explanation of the step by step calculation is presented in the chapter *IEA estimates: Changes under the 2006 IPCC Guidelines*.

IEA estimates vs. UNFCCC submissions

Based on the IEA globally collected energy data, the IEA estimates of CO₂ emissions from fuel combustion are a global database obtained following harmonised definitions and comparable methodologies across countries. They do not represent an official source for national submissions, as national administrations should use the best available country-specific information to complete their emissions reporting.

The IEA CO₂ estimates can be compared with those reported by countries to the UNFCCC Secretariat to highlight possible problems in methods, input data or emission factors. Still, care should be used in interpreting the results of any comparison since the IEA estimates may differ from a country's official submission for many reasons.

For most Annex II countries, the two calculations are expected to be within 5-10%, depending on the coverage of the fuel combustion sector in the national inventory. For some EIT and non-Annex I countries, differences may be larger. If the underlying energy data are different, more work is needed on the collecting and reporting of energy statistics.

In case of systematic biases in the energy data or emission factors, emission trends will usually be more reliable than the absolute emission levels. By comparing trends in the IEA estimates with trends in emissions as reported to the UNFCCC, it should be possible to identify definition problems or methodological differences.

Some of the reasons for these differences are:

- **The IEA uses a Tier 1 method to compute emissions estimates.**

For the calculation of CO₂ emissions from fuel combustion, the IEA uses a Tier 1 method. Countries may be using a more sophisticated Tier 2 or Tier 3 method that takes into account more detailed country-specific information available (e.g. on different technologies or processes).

- **Energy activity data based on IEA energy balances may differ from those used for the UNFCCC calculations.**

Countries often have several "official" data sources such as a Ministry, a Central Bureau of Statistics, a nationalised electricity company, etc. Data can also be

collected from the energy suppliers, the energy consumers or customs statistics. The IEA Secretariat tries to collect the most accurate data, but does not necessarily have access to the complete data set that may be available to national experts calculating emission inventories for the UNFCCC. In addition to different sources, the methodology used by the national bodies providing the data to the IEA and to the UNFCCC may differ. For example, general surveys, specific surveys, questionnaires, estimations, combined methods and classifications of data used in national statistics and in their subsequent reclassification according to international standards may result in different series.

- **The IEA uses average net calorific values for oil products.**

To transform fuel consumption data from physical units to energy units, the IEA uses an average net calorific value (NCV) for each secondary oil product. These NCVs are region-specific and constant over time. Country-specific NCVs that can vary over time are used for NGL, refinery feedstocks and additives. Crude oil NCVs are further split into production, imports, exports and average. Different coal types have specific NCVs for production, imports, exports, inputs to main activity power plants and coal used in coke ovens, blast furnaces and industry, and can vary over time for each country.

Country experts may have more detailed data on calorific values available when calculating the energy content of the fuels. This in turn could produce different values than those of the IEA.

- **The IEA uses average carbon content values.**

The IEA uses the default carbon content values given in the *2006 GLs*. Country experts may have better information available, allowing them to use country-specific values.

- **The IEA cannot allocate emissions from auto-producers into the end-use sectors.**

The *2006 GLs* recommend that emissions from auto-production should be included with emissions from other fuel use by end-consumers. At the same time, the emissions from the autoproduction of electricity and heat should be excluded from the energy transformation source category to avoid double counting. The IEA is not able to allocate the fuel use from auto-producers between industry and *other*. Therefore, this publication shows a category called “Unallocated auto-producers”. However, this should not affect the total emissions for a country.

- **Military emissions may be treated differently.**

According to the *2006 GLs*, military emissions should be reported in Source/Sink Category 1 A 5, *Non-Specified*. Previously, the IEA questionnaires requested that warships be included in international marine bunkers and that the military use of aviation fuels be included in domestic air. All other military use should have been reported in *non-specified other*.

At the IEA/Eurostat/UNECE Energy Statistics Working Group meeting (Paris, November 2004), participants decided to harmonise the definitions used to collect energy data on the joint IEA/Eurostat/UNECE questionnaires with those used by the IPCC to report GHG inventories. As a result, starting in the 2006 edition of this publication, all military consumption should be reported in *non-specified other*. Sea-going versus coastal is no longer a criterion for splitting international and domestic navigation.

However, it is not clear whether countries are reporting on the new basis, and if they are, whether they will be able to revise their historical data. The IEA has found that in practice most countries consider information on military consumption as confidential and therefore either combine it with other information or do not include it at all.

- **The IEA estimates include all CO₂ emissions from fuel combustion. Countries may have included parts of these emissions in the IPCC category industrial processes and product use.**

Although emissions totals would not differ, the allocation to the various sub-totals of a national inventory could. National GHG inventories submitted to the UNFCCC divide emissions according to source categories. Two of these IPCC Source/Sink Categories are energy, and industrial processes and product use. Care must be taken not to double count emissions from fuel combustion that occur within certain industrial processes (e.g. iron and steel). The IEA estimates in this publication include all the CO₂ emissions from fuel combustion, while countries are asked to report some of them within the industrial processes and product use category under the *2006 GLs*. See a more detailed discussion in the chapter *IEA Estimates: Changes under the 2006 IPCC Guidelines*.

- **The units may be different.**

The *2006 GLs* ask that CO₂ emissions be reported in Gg of CO₂ (1 Gg = 1 kilotonne). A million tonnes of CO₂ is equal to 1 000 Gg of CO₂, so to compare the numbers in this publication with national inventories expressed in Gg, the IEA emissions must be multiplied by 1 000.

Inventory quality: identifying key categories

The *IPCC Guidelines* allow Parties to the UNFCCC to prepare and periodically update national inventories that are accurate, complete, comparable and transparent. Inventory quality is an important issue since countries are now implementing legally-binding commitments.

To reduce the overall inventory uncertainty in a cost-effective way, it is useful to identify those categories (key categories⁴) that have the greatest contribution to overall inventory uncertainty. By identifying key categories in the national inventory, inventory compilers can prioritise their efforts and improve their overall estimates. It is good practice for each country to identify its national key categories in a systematic and objective manner. Such a process will lead to improved inventory quality, as well as greater confidence in the estimates that are developed.

The *2006 GLs* identify a key category as one that is prioritised within the national inventory system because its estimate has a significant influence on a country's total inventory of greenhouse gases in terms of the absolute level, the trend, or the uncertainty in emissions and removals.

For a more complete description of the IPCC methodology for determining key categories, see Volume 1, Chapter 4 of the *2006 GLs*.

The IEA has disaggregated the key category analysis to the same level of detail presented in the country tables of this publication. For each country, the nine largest categories are shown, split by the various fuel types: coal, oil, gas and other.

For the level assessment, the CO₂ emissions from fuel combustion as calculated by the IEA are supplemented, where possible, by the figures submitted by the Annex I Parties to the UNFCCC in their latest GHG inventory submissions for CO₂ (fugitive emissions), CH₄, N₂O, HFCs, PFCs and SF₆, not taking into account CO₂ emissions/removals from land use, land use change and forestry.⁵

For the non-Annex I Parties, CO₂ emissions from fuel combustion are taken from IEA estimates, and are

supplemented by data for other sources and provided by JRC and PBL (see Part III for further information). As this database only covers emission to 2015, the 2016 level of GHG emissions was extrapolated based on the growth rate from 2012 to 2015 of each source and gas.

Notes on tables and graphs

This publication presents for each country and regional aggregate a set of six graphs and three tables with key indicators (Part II, Country Tables). A selection of key indicators is also presented in summary tables for country-to-country comparison (Part II, Summary Tables).

Table 1: Key indicators

Row 1: CO₂ *fuel combustion* presents total CO₂ emissions from fuel combustion as calculated using the IEA energy balances and the methodologies outlined in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. For notes on methods and sources, see the chapter *IEA estimates: Changes under the 2006 IPCC Guidelines*.

Row 2: Share of World CO₂ from fuel combustion presents national/regional CO₂ emissions from fuel combustion divided by World CO₂ emissions from fuel combustion, expressed as a percentage.

Row 3: TPES presents the Total Primary Energy Supply, calculated as production + imports - exports - international marine bunkers - international aviation bunkers ± stock changes.

Row 4: GDP presents the Gross Domestic Product in 2010 US dollars using exchange rates. For notes on methods and sources, please see the chapter on Indicator sources and methods.

Row 5: GDP PPP presents the Gross Domestic Product in 2010 US dollars using purchasing power parities. For notes on methods and sources, see the chapter on Indicator sources and methods.

Row 6: Population. For notes on sources see the chapter on Indicator sources and methods.

Row 7: CO₂/TPES presents the carbon intensity of the energy mix. For notes on methods see the chapter on Indicator sources and methods.

Row 8: CO₂/GDP presents the carbon intensity of the economy, using exchange rates. For notes on methods and sources, see the chapter on Indicator sources and methods.

4. In the *2000 IPCC Good Practice Guidance for National Greenhouse Gas Inventories*, the concept was named 'key source categories'.

5. As recommended in the *IPCC Good Practice Guidance*.

Row 9: CO₂/GDP PPP presents the carbon intensity of the economy, using purchasing power parities. For notes on methods and sources, see the chapter on Indicator sources and methods.

Row 10: CO₂/population presents the per capita CO₂ emissions, based on CO₂ fuel combustion. For notes on sources, see the chapter on Indicator sources and methods.

Row 11: Share of electricity output from fossil fuels presents electricity output from fossil fuels divided by total electricity output, expressed as a percentage. For notes on sources, see the chapter on Indicator sources and methods.

Row 12: CO₂/kWh of electricity presents CO₂ emissions from total fossil fuel inputs to electricity generation divided by total electricity output.

Row 13-17: CO₂ emissions and drivers - Kaya decomposition present indices of CO₂ emissions (CO₂ fuel combustion), population, GDP/population, TPES/GDP and CO₂/TPES, (based on GDP PPP time series). It represents the decomposition of CO₂ emissions into drivers (Kaya identity) explained in the chapter on Indicator sources and methods.

Table 2: CO₂ emissions by sector

Row 1: *CO₂ fuel combustion*: as in Row 1 of Table 1.

Row 2: Electricity and heat generation contains the sum of emissions from main activity producers and autoproducers of electricity and/or heat. Emissions from own on-site use of fuel are included.

Main activity producers are defined as those undertakings whose primary activity is to supply the public. They may be publicly or privately owned. This corresponds to IPCC Source/Sink Category 1 A 1 a.

Autoproducers are defined as undertakings that generate electricity and/or heat, wholly or partly for their own use as an activity which supports their primary activity. They may be privately or publicly owned. Under the *2006 IPCC Guidelines*, these emissions would normally be distributed between industry, transport and *other*.

Row 3: *Other energy industry own use* contains emissions from fuel combusted in oil refineries, for the manufacture of solid fuels, coal mining, oil and gas extraction and other energy-producing industries. This corresponds to the IPCC Source/Sink Categories 1 A 1 b and 1 A 1 c.

According to the *2006 IPCC Guidelines*, emissions from coke inputs to blast furnaces, may be reported under the source/sink category industrial processes and product use rather than energy. In the reduction of iron in a blast furnace through the combustion of coke, the primary purpose of the coke oxidation is to produce pig iron and the emissions can be considered as resulting from an industrial process. In the IEA estimations, emissions from energy industry own use in blast furnaces have been included in this category. Care must be taken not to double count these emissions in both energy, and industrial processes and product use.

Row 4: *Manufacturing industries and construction* contains the emissions from combustion of fuels in industry. The IPCC Source/Sink Category 1 A 2 includes these emissions. However, in the *2006 IPCC Guidelines*, the IPCC category also includes emissions from industry autoproducers that generate electricity and/or heat. The IEA data are not collected in a way that allows the energy consumption to be split by specific end-use and therefore, in this publication autoproducers are excluded from this category. See Row 2, *Electricity and heat generation*.

According to the 2006 IPCC GLs, emissions resulting from the combustion of certain fuels in specific sectors (see below) may be reported under industrial processes and product use rather than energy. However, in IEA estimates, these emissions have been included in this category. Care must be taken not to double count these emissions in both energy, and industrial processes and product use.

- Coke oven coke deliveries to the iron and steel and non-ferrous metals sectors.
- Coke oven gas, blast furnace gas and other recovered gases deliveries to iron and steel.

Similarly, under the 2006 IPCC GLs coal tar deliveries to the chemical and petrochemical, and construction sectors may be completely excluded from energy sector emissions calculations, as they are deemed to be destined for non-energy use. However, where these fuels have been reported under energy-use they have been included in IEA estimates.

Row 5: *Transport* contains emissions from the combustion of fuel for all transport activity, regardless of the sector, except for *international marine bunkers* and *international aviation bunkers*, which are not included in *transport* emissions at a national or regional level (except for World transport emissions). This includes domestic aviation, domestic navigation, road, rail and pipeline transport, and corresponds to IPCC Source/

Sink Category 1 A 3. The IEA data are not collected in a way that allows the autoproducer consumption to be split by specific end-use and therefore, in this publication autoproducers are excluded from this category. See Row 2, *Electricity and heat generation*.

Note: Starting in the 2006 edition, military consumption previously included in *domestic aviation* and in *road* should be reported under *non-specified other*. See the section *IEA estimates vs. UNFCCC submissions* earlier in the chapter, for further details.

Row 6: *Road* contains the emissions arising from fuel use in road vehicles, including the use of agricultural vehicles on highways. This corresponds to the IPCC Source/Sink Category 1 A 3 b.

Row 7: *Other* contains the emissions from commercial/institutional activities, agriculture/forestry, fishing, residential and other emissions not specified elsewhere that are included in the IPCC Source/Sink Categories 1 A 4 and 1 A 5. In the *2006 IPCC Guidelines*, the category also includes emissions from autoproducers in commercial/public services, residential and agriculture that generate electricity and/or heat. The IEA data are not collected in a way that allows the energy consumption to be split by specific end-use, and therefore, in this publication autoproducers are excluded from this category. See Row 2, *Electricity and heat generation*.

Row 8: *Residential* contains all emissions from fuel combustion in households. This corresponds to IPCC Source/Sink Category 1 A 4 b.

Row 9: *Services* (i.e. commercial and public services) contains emissions from all activities of ISIC Rev. 4 Divisions 33, 36-39, 45-47, 52, 53, 55-56, 58-66, 68-75, 77-82, 84 (excluding Class 8422), 85-88, 90-96 and 99.

Row 10: *International marine bunkers* contains emissions from fuels burned by ships of all flags that are engaged in international navigation. The international navigation may take place at sea, on inland lakes and waterways, and in coastal waters. Consumption by ships engaged in domestic navigation is excluded. The domestic/international split is determined on the basis of port of departure and port of arrival, and not by the flag or nationality of the ship. Consumption by fishing vessels and by military forces is also excluded. Emissions from international marine bunkers should be excluded from the national totals. This corresponds to IPCC Source/Sink Category 1 A 3 d i.

Row 11: *International aviation bunkers* contains emissions from fuels used by aircraft for international

aviation. Fuels used by airlines for their road vehicles are excluded. The domestic/international split should be determined on the basis of departure and landing locations and not by the nationality of the airline. Emissions from international aviation should be excluded from the national totals. This corresponds to IPCC Source/Sink Category 1 A 3 a i.

Table 3: Key categories for CO₂ emissions from fuel combustion

See section *Inventory quality: identifying key categories* earlier in this chapter for methodological explanations. This table only shows the nine largest key sources of CO₂ from fuel combustion. As a result, in most cases the cumulative contribution will not be 95% as recommended in the *Good Practice Guidance*. Key categories from fugitive emissions; industrial processes and product use; agriculture, forestry and other land use; and waste are not shown. The percentage of CO₂ emissions from fuel combustion in total GHG emissions is included as a memo item at the bottom of the table.

Figure 1: CO₂ emissions by fuel

Based on CO₂ fuel combustion emissions. The product *coal* refers to the aggregate of coal, peat and oil shale. The product *gas* refers to natural gas. The product *other* includes industrial waste and non-renewable municipal waste.

Figure 2: CO₂ emissions by sector

Based on CO₂ fuel combustion emissions. The sector *other* includes emissions from commercial/public services, agriculture/forestry and fishing. Emissions from unallocated autoproducers are included in *Electricity and heat*.

Figure 3: Electricity generation by fuel

The product *other* includes geothermal, solar, wind, combustible renewables and waste, etc. Electricity generation includes both main activity producer and autoproducer electricity.

Figure 4: CO₂ from electricity generation: driving factors

Presents the change in CO₂ emissions from electricity generation over time, for four time periods, as the sum of the change in four driving factors: CO₂ intensity of the fossil fuel mix, fossil share of electricity, thermal efficiency of fossil fired generation, and total electricity output. For notes on methodologies and sources, see the chapter on Indicator sources and methods.

Figure 5: Changes in selected indicators

Presents average annual changes, computed as compounded annual growth rates, for three different periods, for the following variables: CO₂ emissions, CO₂/TPES, CO₂/GDP PPP, CO₂/population. For notes on methodologies and sources, see the chapter on Indicator sources and methods.

Figure 6: Total CO₂ emissions and drivers

Presents indices of CO₂ emissions and of four drivers of emission trends, as identified in the Kaya identity: population, GDP/population, TPES/GDP, CO₂/TPES (1990=100 unless otherwise specified), based on GDP PPP time series. The quantitative impact of each driver on total CO₂ emissions over time is also presented. This has been calculated using the logarithmic mean divisia (LMDI) method as described in the section Drivers of electricity generation emissions trends earlier in the chapter. For methodology and notes on sources, see the chapter on Indicator sources and methods.

Note: in the tables and figures presented in this publication, peat and oil shale are aggregated with *coal*; the product *gas* refers to natural gas; and with the exception of figure 4, the product other includes industrial waste and non-renewable municipal waste.

Country notes

Detailed country notes and sources for the underlying energy data are available in the IEA World Energy balances publication⁶.

Armenia

Data for Armenia are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Azerbaijan

Data for Azerbaijan are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Bangladesh

Data for Bangladesh are reported on a fiscal year basis. Data for 2016 are for 1 July 2016 – 30 June 2017.

Belarus

Data for Belarus are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Bosnia and Herzegovina

Data for Bosnia and Herzegovina are available starting in 1990. Prior to that, they are included in Former Yugoslavia.

Botswana

Data for Botswana are available starting in 1995. Prior to that, they are included in Other Africa.

Brazil

Brazil joined the IEA as an Association country in October 2017. Accordingly, Brazil is now included in the IEA and Accession/Association countries regional aggregate for data starting in 1971 and for the entire time series.

Bulgaria

According to the provisions of Article 4.6 of the Convention and Decisions 9/CP.2 and 11/CP.4, Bulgaria is allowed to use 1988 as the base year.

Cambodia

Data for Cambodia are available starting in 1995. Prior to that, they are included in Other Asia.

Chile

Data start in 1971.

Croatia

Data for Croatia are available starting in 1990. Prior to that, they are included in Former Yugoslavia.

Curaçao

The Netherlands Antilles was dissolved on 10 October 2010 resulting in two new “constituent countries” (Curaçao and Sint Maarten) with the other islands joining The Netherlands as ‘special municipalities’. However, due to lack of detailed data the IEA Secretariat’s data and estimates under the “Curaçao” still refer to the whole territory of the Netherlands Antilles as it was known prior to 10 October 2010 up to the end of 2011. Data refer only to the island of Curaçao from 2012. The other islands of the former Netherlands Antilles are added to Other Non-OECD Americas from 2012.

6. http://wds.iea.org/wds/pdf/WORLDBAL_Documentation.pdf

Czech Republic

Data start in 1971.

Democratic Republic of the Congo

For data in the GHG tables, The high GHG / GDP PPP ratio is due to high levels of forest fires and subsequent post-burn decay.

Egypt

Data for Egypt are reported on a fiscal year basis. Data for 2016 are for 1 July 2016 – 30 June 2017.

Eritrea

Data for Eritrea are available from 1992. Prior to that, they are included in Ethiopia.

Estonia

Data start in 1990. Prior to that, they are included within Former Soviet Union.

Note: Estonia joined the IEA in May 2014.

Ethiopia

Ethiopia energy data include Eritrea from 1971 to 1991. From 1992 onwards the two countries are reported separately.

Former Yugoslav Rep. of Macedonia

Data for Former Yugoslav Republic of Macedonia are available starting in 1990. Prior to that, they are included in Former Yugoslavia.

Georgia

Data for Georgia are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Hungary

Data start in 1965.

According to the provisions of Article 4.6 of the Convention and Decisions 9/CP.2 and 11/CP.4, Hungary is allowed to use average 1985-1987 as the base year.

India

Data are reported on a fiscal calendar year basis. Data for 2016 are for 1 April 2016 – 31 March 2017.

Islamic Republic of Iran

Data are reported according to the Iranian calendar year. Data for 2015 correspond to 20 March 2015 – 19 March 2016.

Kazakhstan

Data for Kazakhstan are available starting in 1990. Prior to that they are included in Former Soviet Union.

Korea

Data start in 1971.

Kosovo

Data for Kosovo are available starting in 2000. From 1990-1999, data for Kosovo are included in Serbia. Prior to 1990, they are included in Former Yugoslavia.

For data in the GHG tables, from 2000 onwards, all emissions other than CO₂ from fuel combustion are included in Serbia.

Kyrgyzstan

Data for Kyrgyzstan are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Latvia

Data for Latvia are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Lithuania

Data for Lithuania area available starting in 1990. Prior to that, they are included in Former Soviet Union.

Lithuania was not an OECD Member at the time of preparation of this publication. Accordingly, Lithuania does not appear in the list of OECD Members and is still included in the non-OECD aggregates.

Malta

At its fifteenth session, the Conference of the Parties decided to amend Annex I to the Convention to include Malta (Decision 3/CP.15). The amendment entered into force on 26 October 2010.

Mexico

Data start in 1971.

Mexico became the International Energy Agency's 30th member country on 17 February 2018. Accordingly, starting with the 2018 edition, Mexico appears in the list of IEA Members and is included in the IEA zone aggregates for data starting in 1971 and for the entire time series.

Moldova

Data for the Republic of Moldova are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Mongolia

Data for Mongolia are available starting in 1985. Prior to that, they are included in Other Asia.

For data in the GHG tables, the high GHG / GDP PPP ratio for Mongolia is due to high levels of peat decay.

Montenegro

Data for Montenegro are available starting in 2005. From 1990 to 2004, data for Montenegro are included in Serbia. Prior to 1990, data are included in Former Yugoslavia.

For data in the GHG tables, from 2005 onwards, all emissions other than CO₂ from fuel combustion are included in Serbia.

Namibia

Data for Namibia are available starting in 1991. Prior to that, they are included in Other Africa.

Nepal

Data for Nepal are reported on a fiscal year basis. Data for 2016 are for 16 July 2016 - 15 July 2017.

Niger

Data for Niger are available starting in 2000. Prior to that, they are included in Other Africa.

For data in the GHG tables, for 1990 and 1995, Other Africa includes Niger for all CO₂ emissions from fuel combustion.

Norway

Discrepancies between Reference and Sectoral Approach estimates (as presented in the database) and the difference in the resulting growth rates arise from statistical differences between supply and consumption data for oil and natural gas. For Norway, supply of these fuels is the residual of two very large and opposite terms, production and exports.

Poland

According to the provisions of Article 4.6 of the Convention and Decisions 9/CP.2 and 11/CP.4, Poland is allowed to use 1988 as the base year.

Romania

According to the provisions of Article 4.6 of the Convention and Decisions 9/CP.2 and 11/CP.4, Romania is allowed to use 1989 as the base year.

Russia

Data for Russian Federation are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Serbia

Data for Serbia are available starting in 1990. Prior to that, they are included in Former Yugoslavia. Serbia includes Kosovo from 1990 to 1999 and Montenegro from 1990 to 2004.

For data in the GHG tables, Serbia includes Kosovo for all emissions other than CO₂ from fuel combustion from 2000 onwards, and Montenegro for all emissions other than CO₂ from fuel combustion from 2005 onwards.

Singapore

Due to Singapore's large trade volume in comparison to its final consumption, a slight misalignment of trade figures can have a significant impact on the energy balance of Singapore. As a result, large discrepancies between the Reference and Sectoral Approach estimates (as presented in the database) arise from statistical differences between supply and consumption of oil and oil products.

The IEA Secretariat, the Energy Market Authority and the National Climate Change Secretariat (NCCS) are working closely together on improving data quality for Singapore. Efforts are continuing on this project, therefore breaks in time series between 2008 and 2009 and differences in trends when compared to previous publications may occur for some products.

Slovenia

Data for Slovenia are available from 1990. Prior to that, they are included in Former Yugoslavia in the full publication.

According to the provisions of Article 4.6 of the Convention and Decisions 9/CP.2 and 11/CP.4, Slovenia is allowed to use 1986 as the base year.

South Africa

Large differences between the Reference and Sectoral Approach estimates (as presented in the database) are due to losses associated with coal-to-liquid and to a lesser extent gas-to-liquid transformation.

South Sudan

South Sudan became an independent country on 9 July 2011. Data for South Sudan are available from 2012. Prior to 2012, they are included in Sudan.

For data in the GHG tables, data for South Sudan is included in Sudan for all years.

Sudan

South Sudan became an independent country on 9 July 2011. Data for South Sudan are available from 2012. Prior to 2012, they are included in Sudan.

For data in the GHG tables, data for South Sudan is included in Sudan for all years.

Suriname

Data for Suriname are available from 2000. Prior to 2000, data for Suriname are presented in Other non-OECD Americas.

For data in the GHG tables, for 1990 and 1995, Other non-OECD Americas includes Suriname for all CO₂ emissions from fuel combustion.

Tajikistan

Data for Tajikistan are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Turkmenistan

Data for Turkmenistan are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Ukraine

Data for Ukraine are available starting in 1990. Prior to that, they are included in Former Soviet Union.

United Kingdom

Shipments of coal and oil to the Channel Islands and the Isle of Man from the United Kingdom are not classed as exports. Supplies of coal and oil to these islands are, therefore, included as part of UK supply. Exports of natural gas to the Isle of Man are included with the exports to Ireland.

Uzbekistan

Data for Uzbekistan are available starting in 1990. Prior to that, data are included in Former Soviet Union.

Zambia

For data in the GHG tables, the high GHG / GDP PPP ratio is due to high levels of forest fires and subsequent post-burn decay.

2. INDICATOR SOURCES AND METHODS

CO₂ emissions

The estimates of CO₂ emissions in this publication are based on the *2006 IPCC Guidelines* and represent the total emissions from fuel combustion. This is in contrast to estimates presented prior to the 2015 edition of this publication which were based on the *Revised 1996 IPCC Guidelines*. For details on the impact of this change in methodologies see the chapter *IEA estimates: Changes under the 2006 IPCC Guidelines*.

National totals do not include emissions from international marine and aviation bunkers. See the Country Notes in the chapter *Understanding the IEA CO₂ emissions estimates* for further details.

Population

For OECD countries, the main source of these series for 1970 to 2017 when available is the *OECD National Accounts Statistics* database [ISSN: 2074-3947 (online)], last published in book format as *National Accounts of OECD Countries, Volume 2018 Issue 1: Main Aggregates*, OECD 2018. Data for 1960 to 1969 have been estimated using the growth rates from the population series published in the *OECD Factbook 2015* (online database version). Growth rates from the *OECD Factbook 2015* were also used to estimate data for **Chile** (prior to 1986), **Estonia** (prior to 1993), **Israel** (prior to 1995), the **Slovak Republic** (prior to 1990) and **Slovenia** (prior to 1995).

For non-OECD countries, the main source of the population data is *World Development Indicators*, The World Bank, Washington D.C., 2018.

Population data for **Former Soviet Union** (before 1990), **Chinese Taipei**, **Former Yugoslavia** (before

1990), **Eritrea** (2012-2016), **Kuwait** (1992-1994) and for a few countries within the regions⁶ **Other Africa**, **Other non-OECD Americas** and **Other non-OECD Asia** are based on the CHELEM-CEPII online database, Bureau van Dijk, Paris, 2018. Population data for **Cyprus**⁷ are taken from the Eurostat online database. Population data for **Gibraltar** are taken from the government of Gibraltar *Key Indicators* publication available online.

GDP and GDP PPP

GDP using exchanges rates: expressed in billion 2010 USD.

For OECD countries, the main source of these series for 1970 to 2017 is the *OECD National Accounts Statistics* database [ISSN: 2074-3947 (online)], last published in book format as *National Accounts of OECD Countries, Volume 2018 Issue 1: Main Aggregates*, OECD 2018. GDP data for **Australia**, **France**, **Greece**, **Korea**, **Sweden** and the **United Kingdom** for 1960 to 1969 and **Denmark** for 1966 to 1969 as well as for **Netherlands** for 1969 were taken from the same source. GDP data for 1960 to 1969 for the other countries have been estimated using the growth rates from the series in the *OECD Economic Outlook* No 98 and other data previously published by the OECD. Growth rates from these sources were also used to estimate data for the **Czech Republic** (prior to 1990), **Hungary** (prior to 1991) and **Poland** (prior to 1990) and the **Slovak Republic** (prior to 1992). Data for **Chile** (prior to 1986) and **Estonia** (prior to 1992) are IEA Secretariat estimates based on GDP growth rates from the World Bank.

7. Please refer to the section on Geographical coverage.

For **non-OECD countries**, the main source of the GDP data is *World Development Indicators*, The World Bank, Washington D.C., 2018. GDP figures for, **Gibraltar, Democratic People's Republic of Korea, Former Soviet Union** (before 1990), **Syrian Arab Republic, Chinese Taipei, Former Yugoslavia** (before 1990) and a few countries within the regions⁶ **Other Africa, Other non-OECD Americas** and **Other non-OECD Asia** are based on the CHELEM-CEPII online databases, Bureau van Dijk, 2018.

GDP figures for **Albania** (1971-1979), **Angola** (1971-1984), **Bahrain** (1971-1980 and 2016), **Bosnia and Herzegovina** (1990-1993), **Brunei** (1971-1974), **Bulgaria** (1971-1979), **Croatia** (1990-1994), **Cuba** (2016), **Eritrea** (2012-2016), **Ethiopia** (1971-1980), **Haiti** (1971-1997), **Iran** (2016), **Jordan** (1971-1974), **Kuwait** (1971-1991 and 2016), **Lebanon** (1971-1987), **Libya** (1971-1998 and 2012-2016), **Lithuania** (1990-1994), **Mauritius** (1971-1975), **Moldova** (1990-1994), **Mozambique** (1971-1979), **Oman** (2016), **Romania** (1971-1989), **Russia** (1990-1994), **Tanzania** (1971-1987), **United Arab Emirates** (1971-1974), **Venezuela** (2013-2016) and **Vietnam** (1971-1983), **Yemen** (1971-1989), have been estimated based on the growth rates of the CHELEM-CEPII online database, Bureau van Dijk, 2018

The GDP 2016 figure for **Greenland** is calculated based on historical data based on *World Development Indicators*, The World Bank, Washington D.C., 2018

For **Curaçao**, GDP figures are based on historical CHELEM-CEPII GDP data for Netherlands Antilles before the country's dissolution, and on Curaçao/Sint Maarten nominal GDP ratios calculated based on information received from Curaçao Central bank. For **South Sudan**, GDP figures are based on data from the International Monetary Fund.

The GDP data have been compiled for all individual countries at market prices in 2010 US dollars.

GDP using purchasing power parities: expressed in billion 2010 USD. Purchasing power parities are the rates of currency conversion that equalise the purchasing power of different currencies. A given sum of money, when converted into different currencies at the PPP rates, buys the same basket of goods and services in all countries. In other words, PPPs are the rates of currency conversion which eliminate the differences in price levels between different countries.

The PPPs selected to convert the GDP from national currencies to US dollars were aggregated using the Éltető, Köves and Szulc (EKS) Eurostat-OECD method and rebased on the United States. For a more detailed description of the methodology please see *Eurostat-OECD Methodological Manual on Purchasing Power Parities*, 2012 edition, European Union / OECD 2012.

For **OECD countries**, see *GDP using exchange rates* for sources.

For **non-OECD countries**, the main source of the GDP PPP data is *World Development Indicators*, The World Bank, Washington, D.C., 2018. However, this source is available for GDP PPP (constant 2011 US dollars scaled to the levels of 2010 using current PPP US dollars) only from 1990. Therefore, prior to 1990 GDP PPP data have been calculated based on the PPP conversion factor (GDP) to market exchange rate ratio.

GDP PPP figures for **Democratic People's Republic of Korea, Former Soviet Union** (before 1990), **Syrian Arab Republic, Chinese Taipei, Former Yugoslavia** (before 1990) and a few countries within the regions⁶ **Other Africa, Other non-OECD Americas** and **Other non-OECD Asia** are based on the CHELEM-CEPII online databases, Bureau van Dijk, 2018. The GDP PPP data have been converted from GDP using purchasing power parity rates. These data have been scaled to the price levels of 2010.

For **Gibraltar**, GDP PPP figures are based on historical CHELEM-CEPII GDP PPP data and government of Gibraltar national accounts.

For **Curaçao**, GDP PPP figures are based on historical CHELEM-CEPII GDP data for Netherlands Antilles before its dissolving, and for 2012-2015 GDP PPP is calculated based on historical GDP PPP / GDP ratio.

For **South Sudan**, GDP PPP figures are based on International Monetary Fund data.

GDP PPP figures for **Bahrain** (2016), **Bosnia and Herzegovina** (1990-1993), **Croatia** (1990- 1994), **Cuba**, **Eritrea** (2012-2016), **Haiti** (1990-1997), **Iraq** (1990-1999), **Kuwait** (1990- 1991), **Libya** (1990-1998 and 2012-2016), **Lithuania** (1990-1994), **Moldova** (1990-1994), **Oman** (2016), **Serbia** (1990-1994), **Qatar** (1990-2000) and **Venezuela** (2015-2016) have been estimated using the ratio of GDP PPP and GDP data based on CHELEM-CEPII online database,

Bureau van Dijk, 2018. These data have been scaled to the price levels of 2010.

The GDP PPP reflect the changes to power purchasing parity rates based on the 2011 International Comparison Program (ICP), published in 2014. The ICP has worked for 6 years to better estimate the value of the PPP ‘basket of goods’ for all countries for which the World Bank calculates GDP PPP. For many countries, this value has significantly changed in comparison to previous ICP exercises. This leads to significant revisions to GDP PPP for many countries compared to previous publications.

Please note that the regional totals shown for OECD and other regions were calculated by summing individual countries’ GDP data. This calculation yields slightly different results to the GDP totals published by OECD in its national accounts which are derived from chained-linked indices. GDP data from the World Bank have also been summed rather than using chain-linked indices.

Electricity output

Total output (shown in the summary tables section) includes electricity generated using fossil fuels, nuclear, hydro (excluding pumped storage), geothermal, solar, biofuels, etc.

Both **main activity**⁸ **producer** and **autoproducer**⁹ **plants** have been included where available.

Data include the total amount of electricity in TWh generated by both **electricity plants** and **CHP plants**. Heat production from CHP plants is not included.

CO₂ / TPES

This ratio is expressed in tonnes of CO₂ per terajoule. It has been calculated using the CO₂ fuel combustion emissions and total primary energy supply (including biofuels and other non-fossil forms of energy).

8. Main activity producers generate electricity and/or heat for sale to third parties, as *their primary activity*. They may be privately or publicly owned. Note that the sale need not take place through the public grid.

9. Autoproducer undertakings generate electricity and/or heat, wholly or partly for their own use as an activity which supports their primary activity. They may be privately or publicly owned.

CO₂ / TFC

This ratio is expressed in tonnes of CO₂ per terajoule. It has been calculated using the CO₂ fuel combustion emissions and total final consumption (including biofuels and other non-fossil forms of energy).

CO₂ / GDP

This ratio is expressed in kilogrammes of CO₂ per 2010 US dollar. It has been calculated using CO₂ fuel combustion emissions and is shown with both GDP calculated using exchange rates and GDP calculated using purchasing power parities.

CO₂ / population

This ratio is expressed in tonnes of CO₂ per capita. It has been calculated using CO₂ fuel combustion emissions.

Per capita CO₂ emissions by sector

These ratios are expressed in kilogrammes of CO₂ per capita. They have been calculated in two different ways. In the first ratio, the emissions from electricity and heat production are shown separately. In the second ratio, the emissions from electricity and heat have been allocated to final consuming sectors in proportion to the electricity and heat consumed by those sectors.

Key categories

It is good practice for each inventory agency to identify its national key source categories in a systematic and objective manner, by performing a quantitative analysis of the relationships between the level and the trend of each source category’s emissions and total national emissions.

In this publication, a **Tier 1 Level Assessment** based on CO₂ emissions from fuel combustion is presented in Table 3 for each country and region for the most

recent year of data. The contribution of each category to the total national inventory level is calculated as follows:

$$\text{Category Level Assessment} = \text{Category Estimate} / \text{Total Estimate}$$

$$L_x = E_x / E$$

where:

L_x is the Level Assessment for category x in the most recent year of data

E_x is the Category estimate - the CO₂ emissions estimate of category x in the most recent year of data

E is the Total estimate - the total estimated inventory GHG in the most recent year of data.

The value of the source category Level Assessment is calculated separately for each category, and the cumulative sum of all the entries is calculated.

Macroeconomic drivers of CO₂ emissions trends

Tables and graphs for drivers refer to the decomposition of CO₂ emissions into four driving factors (Kaya identity)¹⁰, which is generally presented in the form:

$$\text{Kaya identity}$$

$$C = P (G/P) (E/G) (C/E)$$

where:

C = CO₂ emissions;

P = population;

G = GDP;

E = primary energy consumption.

The identity expresses, for a given time, CO₂ emissions as the product of population, per capita economic output (G/P), energy intensity of the economy (E/G) and carbon intensity of the energy mix (C/E). Because of possible non-linear interactions between terms, the sum of the percentage changes of the four factors,

e.g. $(P_y - P_x)/P_x$, will not generally add up to the percentage change of CO₂ emissions $(C_y - C_x)/C_x$. However, relative changes of CO₂ emissions in time can be obtained from relative changes of the four factors as follows:

$$\text{Kaya identity: relative changes in time}$$

$$C_y/C_x = P_y/P_x (G/P)_y/(G/P)_x (E/G)_y/(E/G)_x$$

where x and y represent for example two different years.

In this publication, the Kaya decomposition is presented as:

$$\text{CO}_2 \text{ emissions and drivers}$$

$$\text{CO}_2 = P (\text{GDP}/P) (\text{TPES}/\text{GDP}) (\text{CO}_2/\text{TPES})$$

where:

CO_2 = CO₂ emissions;

P = population;

GDP^{11}/P = GDP/population;

$\text{TPES}/\text{GDP}^{11}$ = Total Primary Energy Supply per GDP;

CO_2/TPES = CO₂ emissions per unit TPES.

Indices of all terms (1990 = 100 unless otherwise specified) are shown for each country and regional aggregate in Part II, both in the Summary tables and in the individual country/region pages (Table 1, Key indicators, and Figure 6, CO₂ emissions and drivers). Note that in its index form, CO₂/TPES corresponds to the Energy Sector Carbon Intensity Index (ESCI)¹².

The Kaya identity can be used to discuss the primary driving forces of CO₂ emissions. For example, it shows that, globally, increases in population and GDP per capita have been driving upwards trends in CO₂ emissions, more than offsetting the reduction in energy intensity. In fact, the carbon intensity of the energy mix is almost unchanged, due to the continued dominance of fossil fuels - particularly coal - in the energy mix, and to the slow uptake of low-carbon technologies.

However, it should be noted that there are important caveats in the use of the Kaya identity. Most important, the four terms on the right-hand side of equation should be considered neither as fundamental driving forces in themselves, nor as generally independent from each other.

10. Yamaji, K., Matsushashi, R., Nagata, Y., Kaya, Y., *An integrated system for CO₂/Energy/GNP analysis: case studies on economic measures for CO₂ reduction in Japan*. Workshop on CO₂ reduction and removal: measures for the next century, March 19, 1991, International Institute for Applied Systems Analysis, Laxenburg, Austria.

11. GDP based on purchasing power parities (PPP).

12. See the IEA publication *Tracking Clean Energy Progress 2016*.

Drivers of electricity generation emissions trends

In this edition, new graphs present the change in CO₂ emissions from electricity generation over time decomposed into the respective changes of four driving factors¹³:

$$\text{CO}_2 \text{ emissions from electricity generation} \\ C = (C/E) (E/ELF) (ELF/EL) (EL)$$

where:

- C** = CO₂ emissions;
- E** = fossil fuel inputs to thermal generation;
- ELF** = electricity output from fossil fuels;
- EL** = total electricity output;

This can be rewritten as:

$$\text{CO}_2 \text{ emissions from electricity generation} \\ C = (CF) (EI) (EFS) (EL)$$

where:

- C** = CO₂ emissions;
- CF** = carbon intensity of the fossil fuel mix;
- EI** = the reciprocal of fossil fuel based electricity generation efficiency;
- EFS** = share of electricity from fossil fuels;
- EL** = total electricity output.

This decomposition expresses, for a given time, CO₂ emissions from electricity generation as the product of the carbon intensity of the fossil fuel mix (CF), the reciprocal of fossil fuel based thermal electricity generation efficiency (1/EF), the share of electricity from fossil fuels (EFS) and total electricity output (EL).

However, due to non-linear interactions between terms, if a simple decomposition is used, the sum of the percentage changes of the four factors, e.g. $(CF_y - CF_x)/CF_x$ may not perfectly match the percentage change of total CO₂ emissions $(C_y - C_x)/C_x$. To avoid this, a more complex decomposition method is required. In this case, the

logarithmic mean divisia (LMDI) method proposed by Ang (2004)¹⁴ has been used.

Using this method, the change in total CO₂ emissions from electricity generation (ΔC_{TOT}) between year t and a base year 0 , can be computed as the sum of the changes in each of the individual factors as follows:

$$\Delta C_{TOT} = \Delta C_{CF} + \Delta C_{EI} + \Delta C_{EFS} + \Delta C_{EL}$$

where:

$$\Delta C_{CF} = L(CF^t, CF^0) \ln \left(\frac{CF^t}{CF^0} \right)$$

$$\Delta C_{EI} = L(EI^t, EI^0) \ln \left(\frac{EI^t}{EI^0} \right)$$

$$\Delta C_{EFS} = L(EFS^t, EFS^0) \ln \left(\frac{EFS^t}{EFS^0} \right)$$

$$\Delta C_{EL} = L(EL^t, EL^0) \ln \left(\frac{EL^t}{EL^0} \right)$$

and:

$$L(x, y) = (y - x) / (\ln y - \ln x)$$

This decomposition can be useful when analysing the trends in CO₂ emissions from electricity generation. For instance, it shows that globally, since 1990, the main driver of increased CO₂ emissions from electricity generation has been increased electricity output, with improvements in the overall thermal efficiency, and the CO₂ intensity of the electricity generation mix being offset by an increase in the share of electricity derived from fossil fuel sources.

However, as is the case with the Kaya decomposition, it should be noted that the four terms on the right-hand side of equation should be considered neither as fundamental driving forces in themselves, nor as generally independent from each other. For instance, substituting coal with gas as a source of electricity generation would likely affect both the CO₂ intensity of the electricity generation mix and the thermal efficiency of generation.

CO₂ emissions per kWh

The indicator: definition

In the total CO₂ emissions per kWh, the numerator presents the CO₂ emissions from fossil fuels consumed for electricity generation, while the denominator presents the total electricity generated, coming from fossil fuels, but also from nuclear, hydro,

13. M. Zhang, X. Liu, W. Wang, M. Zhou. *Decomposition analysis of CO₂ emissions from electricity generation in China*. Energy Policy, 52 (2013), pp. 159–165.

14. B. W. Ang, *Decomposition analysis for policymaking in energy: which is the preferred method?*, Energy Policy, 32 (9) (2004), pp. 1131–1139.

geothermal, solar, biofuels, etc. As a result, the emissions per kWh vary a lot across countries and from year to year, depending on the generation mix.

In the CO₂ emissions per kWh **by fuel**:

- Coal includes primary and secondary coal, and coal gases. Peat and oil shale have also been aggregated with coal, where applicable.
- Oil includes oil products (and crude oil for some countries).
- Gas represents natural gas.

Note: Emissions per kWh should be used with caution due to data quality problems relating to electricity efficiencies for some countries.

Methodological choices: electricity-only versus combined electricity and heat

In previous editions of this publication, the IEA had published a combined electricity and heat CO₂ emissions per kWh indicator. The indicator was useful as an overall carbon intensity measure of a country's electricity and heat generating sectors, and it was easy to calculate. However, there were a number of drawbacks.

As the efficiency of heat generation is almost always higher than electricity generation, countries with large amounts of district heating (generally colder countries) tended to have a higher efficiency (therefore lower CO₂ intensity) than warmer countries with less district heating. Further, the applications of a combined indicator for electricity and heat are limited; many users have been searching for an electricity-only CO₂ emissions per kWh indicator.

Unfortunately, it is not possible to obtain such an electricity-only indicator directly from IEA energy balance data without any assumption. In fact, for combined heat and power (CHP) plants, there is only one combined input available. While various methods exist to split this input into separate amounts for electricity and heat generation, none has previously been used by the IEA for the purposes of calculating a CO₂ emissions per kWh indicator.

It would be possible to calculate an electricity-only indicator using data for electricity-only plants, which would not encounter the problem of assigning CHP inputs between electricity and heat. However, this would not allow a fair cross-country comparison; some countries get

Fixed-heat-efficiency approach

$$\text{CO}_2\text{kWh} = \frac{\text{CO}_2\text{ELE} + (\text{CO}_2\text{CHP} \times \% \text{ from elec.}) + \text{OWNUSE}_{\text{ELE}}}{\text{ELoutput}_{\text{ELE}} + \text{ELoutput}_{\text{CHP}}}$$

where:

$$\% \text{ from elec.} = \frac{\text{CHPinputs} - ((\text{HEoutput}_{\text{CHP}} \times 0.02388) \div \text{EFF}_{\text{HEAT}})}{\text{CHPinputs}}$$

and:

$$\text{OWNUSE}_{\text{ELE}} = \text{OWNUSE} \times \frac{\text{ELoutput}}{\text{ELoutput} + (\text{HEoutput} \div 3.6)}$$

CO₂_{ELE} = CO₂ emissions from electricity only plants in ktCO₂

CO₂_{CHP} = CO₂ emissions from CHP plants in ktCO₂

OWNUSE = CO₂ emissions from own use in electricity, CHP and heat plants in ktCO₂

ELoutput = total electricity output from electricity and CHP plants in GWh

ELoutput_{ELE} = electricity output from electricity only plants in GWh

ELoutput_{CHP} = electricity output from CHP plants in GWh

HEoutput = total heat output from CHP and heat plants in TJ

HEoutput_{CHP} = heat output from CHP plants in TJ

CHPinputs = energy inputs to CHP plants in ktoe

EFF_{HEAT} = efficiency of heat generation - assumed to be 0.9 (*i.e.* 90%) except when the observed efficiency of CHP generation is higher than 90%, in which case emissions are allocated using the proportionality approach (EFF_{HEAT} = EFF_{ELEC} = EFF_{CHP}).

a majority of their electricity from CHP, while others from electricity-only plants. As non-thermal renewables are solely electricity-only plants, and over 99% of non-emitting global nuclear generation is from electricity-only plants, then calculating this electricity-only plants indicator would significantly understate the electricity carbon intensity for many countries.

Electricity-only indicator: allocation of emissions from CHP plants

To allocate the CHP input to electricity and heat separately, the simplest method would be a **proportionality approach**, allocating inputs based on the proportion of electricity and heat in the output, also used by the IEA electricity questionnaire. This is equivalent to fixing the efficiency of electricity and heat to be equal. With the advantage of simplicity and transparency, the proportionality approach however tends to overstate electricity efficiency and to understate heat efficiency. For example, for CHP generation in OECD countries, total efficiency is around 60%. However, total electricity-only plant efficiency is around 41% in OECD countries. Similarly, 60% is quite low for heat generation (given typical heat-only plant efficiencies of 80-95%).

An alternative method to avoid unrealistic efficiencies is a **fixed-heat-efficiency approach**, fixing the efficiency of heat generation to compute the input to heat, and calculating the input to electricity as a residual from the total input. The standard heat efficiency was set to that of a typical heat boiler, 90%.

Implementation problems arise in two cases: i) when the observed efficiency is over 100% (i.e. there are problems in data quality), and ii) when the observed efficiency is between 90% and 100% (the total efficiency may be correct or it may be overstated).

In the first case, when the total efficiency is over 100% because the data are not reported correctly, it is not possible to use the fixed-heat-efficiency approach and by default the proportionality approach was used to allocate the inputs based on the output shares.

In the second case, where the total CHP efficiency was between 90% and 100% (which may or may not indicate a data quality problem), assuming a 90% efficiency for heat generation would incorrectly imply that the efficiency of power generation was equal to or higher than that of heat generation. However, as the real heat efficiency cannot be determined, the proportionality approach was used also here by default.

In general, the fixed-heat-efficiency approach attributes larger emissions to electricity than the proportionality approach, with values much closer to those

of electricity-only plants. The IEA has used the fixed-heat-efficiency approach for several editions of its *World Energy Outlook*.

Comparison between electricity-only and combined electricity and heat ratios (2014 data, from the 2016 edition)

Implied carbon emission factors from electricity generation (CO₂ / kWh) for selected products

Average implied carbon emission factors from electricity generation by product are presented below, for selected products. The values below represent the average amount of CO₂ per kWh of electricity produced in OECD member countries between 2011 and 2015. As they are very sensitive to the quality of underlying data, including net calorific values, and of reported input/output efficiencies, they should be taken as indicative; actual values may vary considerably.

Product	gCO ₂ / kWh
Anthracite*	860
Coking coal*	845
Other bituminous coal	870
Sub-bituminous coal	940
Lignite	1020
Gas works gas*	330
Coke oven gas*	390
Blast furnace gas*	2430
Other recovered gases*	1585
Oil shale*	1195
Peat*	765
Natural gas	400
Crude oil*	600
Refinery gas*	460
Liquefied petroleum gases*	540
Kerosene*	655
Gas/diesel oil*	700
Fuel oil	675
Petroleum coke*	940
Municipal waste (non-renew.)*	1195

* The electricity output from these products represents less than 1% of electricity output in the average of OECD member countries for the years 2011-2015. Values will be less reliable and should be used with caution.

For the majority of OECD countries, the electricity-only indicator is not significantly different from the combined electricity and heat indicator, shown in previous editions of this publication and in the online database. For the OECD total in 2014, the electricity-only indicator is 4% higher, while 19 of the OECD's 34 countries saw a difference of 5% or less. Of the 15 countries with differences of more than 5%, 7 countries had large amounts of non-emitting electricity generation, giving them a small ratio to begin with (thus more prone to change). In addition, non-emitting generation is generally electricity-only, and so when the heat-only and heat CHP emissions are removed from the calculation, greater weight is attached to the non-emitting generation, with a lower level for the final indicator.

The countries in the OECD with larger differences are generally coal-intensive countries with large amounts of heat generation. As mentioned, in general, heat plants are more efficient than electricity-only or CHP plants; therefore, excluding heat plants from the calculation increases CO₂ intensity. The same is true if we allocate a high efficiency to the heat part of CHP generation; this decreases the efficiency of the electricity part and thus increases electricity's carbon intensity. Further, CHP and heat plants are more likely to be powered by CO₂-light natural gas while electricity-only plants tend to be powered by CO₂-heavy coal, making the new ratio more CO₂ intensive for these countries.

Specific country examples

The country with the largest difference between the two ratios within the OECD was **Sweden**; in 2014, the electricity only indicator was 64% lower than the

combined electricity and heat indicator. This is due to the high share of non-emitting sources such as hydro (42%) and nuclear (also 42%) in Sweden's electricity generation mix.

Similarly, the electricity only indicator for **Norway** in 2014 was 36% lower than the combined indicator, as the vast majority of the electricity output (96%) is from non-emitting hydroelectric generation.

Conversely, for **Estonia** in 2014 the electricity-only indicator was 36% higher than the combined electricity and heat indicator. This can be explained by the fact that the majority of electricity-only generation comes from oil shale, a fuel with a relatively high carbon emission factor, while heat plants (with a relatively large share of output) are largely fuelled by natural gas and primary solid biofuels.

Another OECD country with a higher electricity-only ratio was **Denmark** (25% higher in 2014). The majority of fossil generation in Denmark is from CHP and the output from these plants is approximately half electricity and half heat. In addition, CHP plants in Denmark have efficiencies of 60-70%. When the heat part of CHP is set to be 90%, the efficiency of the electricity generation is lowered and the indicator is increased.

In many non-member countries, heat data are either zero or not available, which leads to changes of less than 1% in almost 80% of the non-member countries in 2014. The majority of countries which do change are the European and former Soviet Union countries.

3. IEA ESTIMATES: CHANGES UNDER THE 2006 IPCC GUIDELINES

The 2006 IPCC Guidelines methodology: key concepts

This section briefly presents the Tier 1 methodology to estimate CO₂ emissions from fuel combustion based on the *2006 GLs*, outlining the main differences with the *1996 GLs* - used for previous editions of this publication. The focus is on the key points relevant to the IEA estimation. For the complete methodology, the reader should refer to the full IPCC documents.¹⁵

Generally, the Tier 1 estimation of CO₂ emissions from fuel combustion for a given fuel can be summarised as follows:

$$\text{CO}_2 \text{ emissions from fuel combustion} \\ \text{CO}_2 = \text{AD} * \text{NCV} * \text{CC} * \text{COF}$$

where:

- CO₂** = CO₂ emissions from fuel combustion;
- AD** = Activity data;
- NCV** = Net calorific value;
- CC** = Carbon content;
- COF** = Carbon oxidation factor.

Emissions are then summed over all fuels.

While the basic concept of the calculation - the conservation of carbon - is unchanged, the *2006 GLs* differ from the *1996 GLs* in the:

- default **net calorific values** by product;
- default **carbon content** by product;

- default **carbon oxidation factors**;
- treatment of fuels used for **non-energy** purposes;
- **allocation** of fuel combustion emissions across the Energy and IPPU categories.

2006 Guidelines: overview of changes

This section describes the key methodological changes *2006 GLs* for a Tier 1 estimation of CO₂ emissions from fuel combustion, with a short assessment of their impact on results.

Net calorific values

Net calorific values (NCVs) are used to convert the activity data for all the different fuels from "physical" units (e.g. tonnes) to "energy" units (e.g. Joules).

In the *1996 GLs*, country-specific net calorific values were given for primary oil (crude oil and NGL), for primary coal and for a few secondary coal products. These NCVs were based on the average 1990 values of the 1993 edition of the *IEA Energy Balances*.

In the *2006 GLs*, those country-specific NCVs were removed, and one default is provided for each fuel (with upper and lower limits, as done for the carbon content). Large differences were therefore observed for products whose quality varies a lot from country to country, such as primary oil and coal products. Replacing country-specific values with one default value would significantly affect emissions calculations if the default values were used.

15. Both the *1996 GLs* and the *2006 GLs* are available from the IPCC Greenhouse Gas Inventories Programme (www.ipcc-nggip.iges.or.jp).

The IEA CO₂ emissions from fuel combustion estimates are based on the IEA energy balances, computed using time-varying country-specific NCVs. Therefore, they are not affected by changes to the default net calorific values of the 2006 GLs.

Carbon content

Carbon content is the quantity of carbon per unit of energy of a given fuel. Some of the fuel-specific default values for carbon content, called “carbon emission factors” in the 1996 GLs, were revised in the 2006 GLs. In addition, values were added for some fuels not directly mentioned in the 1996 GLs.

As the carbon content may vary considerably for some fuels, the 2006 GLs introduced ranges of values, *i.e.* providing for each fuel a default value with lower and upper limits. The IEA CO₂ emissions are calculated using the IPCC default values.

A summary of the default carbon content values in the two set of guidelines is shown in Table 1. Relative changes between the 2006 GLs and the 1996 GLs range between -13.7% (refinery gas) and + 7.3% (blast furnace gas), although for many fuels the variation is minimal, or zero. Such systematic changes are reflected in Tier 1 CO₂ emissions estimates.

Carbon oxidation factors

A small fraction of the carbon contained in fuels entering the combustion process (typically less than 1-2%) is not oxidised. Under the 1996 GLs, this amount was subtracted from emissions in the calculations by multiplying the calculated carbon content of a fuel by a “fraction of carbon oxidised”. The fraction of carbon oxidised had a value of less than 1.0, which had the effect of reducing the emissions estimate. However, in most instances, emissions inventory compilers had no “real” information as to whether this correction was actually applicable.

Therefore, in the 2006 GLs, it was decided that all carbon is assumed to be emitted by default, unless more specific information is available. Therefore, under the 2006 GLs, the default carbon oxidation factor is equal to 1 for all fuels.

A summary of the default carbon oxidation factors in the two set of guidelines is shown in Table 2. Relative changes from the 1996 GLs and the 2006 GLs are +0.5% for natural gas; +1% for oil, oil products and peat; and +2% for coal. Such changes are reflected in systematic increases in Tier 1 CO₂ emissions estimates.

Table 1. Comparison of default carbon content values*

Kilogrammes / gigajoule

Fuel Type	1996 Guidelines	2006 Guidelines**	Percent Change
Anthracite	26.8	26.8	0.0%
Coking Coal	25.8	25.8	0.0%
Other Bituminous Coal	25.8	25.8	0.0%
Sub-Bituminous Coal	26.2	26.2	0.0%
Lignite	27.6	27.6	0.0%
Patent Fuel	25.8	26.6	+3.1%
Coke oven coke	29.5	29.2	-1.0%
Gas Coke	29.5	29.2	-1.0%
Coal Tar	..	22.0	x
BKB	25.8	26.6	+3.1%
Gas Works Gas	..	12.1	x
Coke Oven Gas	13.0	12.1	-6.9%
Blast Furnace Gas	66.0	70.8	+7.3%
Other recovered gases	..	49.6	x
Peat	28.9	28.9	0.0%
Oil shale	29.1	29.1	0.0%
Natural Gas	15.3	15.3	0.0%
Crude Oil	20.0	20.0	0.0%
Natural Gas Liquids	17.2	17.5	+1.7%
Refinery Feedstocks	20.0	20.0	0.0%
Orimulsion	22.0	21.0	-4.5%
Refinery Gas	18.2	15.7	-13.7%
Ethane	16.8	16.8	0.0%
Liquefied petroleum gases (LPG)	17.2	17.2	0.0%
Motor Gasoline excl. bio		18.9	0.0%
Aviation Gasoline	18.9	19.1	+1.1%
Gasoline type jet fuel		19.1	+1.1%
Kerosene type jet fuel excl. bio	19.5	19.5	0.0%
Other Kerosene	19.6	19.6	0.0%
Gas/Diesel Oil excl. bio	20.2	20.2	0.0%
Fuel Oil	21.1	21.1	0.0%
Naphtha	20.0	20.0	0.0%
Lubricants	20.0	20.0	0.0%
Bitumen	22.0	22.0	0.0%
Petroleum Coke	27.5	26.6	-3.3%
Non-specified oil products		20.0	0.0%
Other hydrocarbons	20.0		
White Spirit & SBP		20.0	0.0%
Paraffin Waxes		20.0	0.0%
Industrial Waste	..	39.0	x
Municipal Waste (non-renewable)	..	25.0	x

* “Carbon content” was referred to as the “carbon emission factor” in the 1996 GLs.

** The 2006 GLs also give the lower and upper limits of the 95 percent confidence intervals, assuming lognormal distributions.

Table 2. Comparison of default carbon oxidation factors*

Fuel Type	1996 Guidelines	2006 Guidelines**	Percent Change
Coal	0.980	1.00	+2.0%
Oil and oil products	0.990	1.00	+1.0%
Natural gas	0.995	1.00	+0.5%
Peat **	0.990	1.00	+1.0%

* “Carbon oxidation factor” was referred to as “fraction of carbon oxidised” in the 1996 GLs.

** The 1996 GLs specified a carbon oxidation factor for peat used for electricity generation only.

Treatment of fuels used for non-energy purposes

Many hydrocarbons are used for non-energy purposes e.g. petrochemical feedstocks, lubricants, solvents, and bitumen. In some of these cases, the carbon in the fuel is quickly oxidised to CO₂, in other cases, it is stored (or sequestered) in the product, sometimes for as long as centuries.

In the 1996 IPCC GLs, Tier 1 Sectoral Approach emissions included emissions from fuels used for non-energy purposes. The share of carbon assumed to be stored (not emitted) was estimated based on default “fractions of carbon stored” (shown for reference in Table 3).

Table 3. Fraction of carbon stored in the 1996 GLs

Fuel Type	1996 Guidelines
Naphtha*	0.8
Lubricants	0.5
Bitumen	1.0
Coal Oils and Tars (from coking coal)	0.75
Natural Gas*	0.33
Gas/Diesel Oil*	0.5
LPG*	0.8
Ethane*	0.8
Other fuels for non-energy use	To be specified

* When used as feedstocks.

Note: this table is included only for reference. CO₂ emissions from fuel combustion in this publication do not include emissions from non-energy use of fuels.

In the 2006 GLs, all deliveries for non-energy purposes are excluded. Numerically, excluding all non-energy use of fuel from energy sector emissions calculations is equivalent to applying a fraction of carbon stored equal to 1 to all quantities delivered for non-energy purposes.

In the case of a complete greenhouse gas inventory covering all IPCC Source/Sink categories, any emissions associated with non-energy use of fuels would be accounted in another Source/Sink category. However, as this publication only deals with CO₂ emissions from fuel combustion, emissions associated with non-energy use of fuels are not any longer included in the IEA CO₂ emissions estimates.

Within the IEA estimates, the effect of this change is mainly noticeable for countries whose petrochemical sectors are large in comparison to the size of their economies, e.g. the Netherlands.

Allocation of fuel combustion emissions across the Energy and the IPPU sectors

To avoid possible double counting, the 2006 GLs state that combustion emissions from fuels obtained directly or indirectly from the feedstock for an Industrial Processes and Product Use (IPPU) process will be allocated to the source category in which the process occurs, unless the derived fuels are transferred for combustion in another source category.

In the case of a complete inventory, this reallocation would not affect total emissions. Still, the effect on individual source categories could be quite significant, especially in countries with large IPPU sectors (e.g. the iron and steel, and non-ferrous metals industries).

To provide continuity with previous editions of this publication and to fully account for fuel combustion emissions, the IEA CO₂ emissions from fuel combustion include all emissions from fuel combustion, irrespective of the category of reporting (Energy or IPPU) under the 2006 GLs.

To ensure comparability with submissions from Parties, an additional online database provides a summary of CO₂ emissions calculated according to the IPCC Reference and Sectoral Approaches, and a breakdown of the fuel combustion emissions which would be reallocated to IPPU under the 2006 GLs.¹⁶

Assessing the overall impact of methodological changes on IEA estimates

Table 4 shows IEA estimates of total CO₂ emissions from fuel combustion for OECD countries, for the 2014 data (from the 2016 edition). Emissions are calculated using: i) the 1996 GLs Sectoral Approach, methodology as in previous publications, and ii) the 2006 GLs¹⁷ - which correspond to the data published in this edition.

16. Note that the data available to the IEA do not allow assessing whether fuels derived from IPPU processes are transferred for combustion in another source category.

17. Including the emissions which may be reallocated from Energy to IPPU under the 2006 GLs.

The overall impact of the change in methodology on the IEA estimates of CO₂ emissions from fuel combustion varies from country to country, mainly depending on the underlying fuel mix and on the relative importance of non-energy use of fuels in the total.

Most countries show a decrease in CO₂ emissions levels under the new methodology, as the reductions due to the removal of non-energy use emissions are generally larger than the systematic increase due to changes in the oxidation factor.

For the year 2014, reductions of 1% or greater are observed for sixty-five countries, with thirteen showing a decrease of 5% or more. The largest relative decreases are observed in countries with high non-energy use of fuels (mainly oil products and natural gas) relative to their total energy consumption: Trinidad and Tobago (-39%), Gibraltar (-17%), Lithuania (-14%), and Singapore, the Netherlands, Belarus and Brunei Darussalam (all -11%). As emissions from non-energy use of fuels are not included in

energy sector emissions under the 2006 GLs, emissions previously attributed to non-energy use of oil products and natural gas are no longer included in IEA CO₂ emissions from fuel combustion estimates for these countries. One country, Curaçao presented a large increase (27%) in 2014. This was due to the inclusion of emissions from reported energy use of bitumen, which had been excluded (considered carbon stored / non-energy use) under the 1996 GLs.

Within the IEA databases, these changes will also be reflected in all indicators derived from CO₂ emissions totals (e.g. CO₂/TPES, CO₂/GDP). Impacts on trends should be visible when the relative weight of the non-energy use of fuels changes in time.

However, as mentioned, most of the methodological changes would not have significant impact in the case of a complete inventory covering all IPCC source/sink categories; in particular, the reallocation of emissions between categories would not affect total emissions estimates, nor the overall trends.

Table 4. Comparison of IEA CO₂ emissions estimates (2014 data, 2016 edition)MtCO₂

Country	1996 GLs CO ₂ Sectoral Approach	2006 GLs CO ₂ Fuel Combustion	Percent Change	Country	1996 GLs CO ₂ Sectoral Approach	2006 GLs CO ₂ Fuel Combustion	Percent Change
World	32903.3	32381.0	-1.6%	Non-OECD Europe and Eurasia			
Annex I Parties	12852.2	12628.4	-2%	Albania	4.3	4.1	-4.7%
Non-Annex I Parties	18932.1	18622.2	-2%	Armenia	5.2	5.2	0.0%
OECD				Azerbaijan	31.3	30.8	-1.6%
Australia	375.2	373.8	-0.4%	Belarus	64.3	57.4	-10.7%
Austria	60.8	60.8	0.0%	Bosnia and Herzegovina	21.2	21.6	1.9%
Belgium	95.0	87.4	-8.0%	Albania	42.2	42.1	-0.2%
Canada	574.6	554.8	-3.4%	Croatia	15.8	15.1	-4.4%
Chile	76.4	75.8	-0.8%	Cyprus ¹⁸	5.7	5.8	1.8%
Czech Republic	98.4	96.6	-1.8%	Georgia	8.0	7.7	-3.8%
Denmark	34.7	34.5	-0.6%	Gibraltar	0.6	0.5	-16.7%
Estonia	17.5	17.5	0.0%	Kazakhstan	220.3	223.7	1.5%
Finland	46.4	45.3	-2.4%	Kosovo	7.3	7.4	1.4%
France	295.8	285.7	-3.4%	Kyrgyzstan	8.3	8.4	1.2%
Germany	734.6	723.3	-1.5%	Latvia	6.7	6.7	0.0%
Greece	66.4	65.9	-0.8%	Lithuania	12.0	10.3	-14.2%
Hungary	41.3	40.3	-2.4%	FYR of Macedonia	7.3	7.4	1.4%
Iceland	2.0	2.0	0.0%	Malta	2.3	2.3	0.0%
Ireland	33.7	33.9	0.6%	Republic of Moldova	7.2	7.2	0.0%
Israel	66.3	64.7	-2.4%	Montenegro	2.2	2.2	0.0%
Italy	325.7	319.7	-1.8%	Romania	69.0	68.2	-1.2%
Japan	1193.3	1188.6	-0.4%	Russian Federation	1525.3	1467.6	-3.8%
Korea	589.5	567.8	-3.7%	Serbia	37.9	38.1	0.5%
Luxembourg	9.2	9.2	0.0%	Tajikistan	4.6	4.7	2.2%
Mexico	432.1	430.9	-0.3%	Turkmenistan	66.6	67.0	0.6%
Netherlands	166.6	148.3	-11.0%	Ukraine	239.6	236.5	-1.3%
New Zealand	33.2	31.2	-6.0%	Uzbekistan	101.0	97.9	-3.1%
Norway	36.9	35.3	-4.3%	Non-OECD Europe and Eurasia	2516.4	2446.1	-2.8%
Poland	281.3	279.0	-0.8%				
Portugal	43.2	42.8	-0.9%				
Slovak Republic	29.9	29.3	-2.0%				
Slovenia	12.6	12.8	1.6%				
Spain	234.8	232.0	-1.2%				
Sweden	38.7	37.4	-3.4%				
Switzerland	37.7	37.7	0.0%				
Turkey	304.8	307.1	0.8%				
United Kingdom	409.0	407.8	-0.3%				
United States	5235.9	5176.2	-1.1%				
OECD Total	12033.5	11855.6	-1.5%				

18. Please refer to the chapter *Geographical coverage* in Part I.

Table 4. Comparison of IEA CO₂ emissions estimates for Non-OECD Countries (2014 data, 2016 edition)MtCO₂

Country	1996 GLs CO ₂ Sectoral Approach	2006 GLs CO ₂ Fuel Combustion	Percent Change	Country	1996 GLs CO ₂ Sectoral Approach	2006 GLs CO ₂ Fuel Combustion	Percent Change
Africa				China			
Algeria	126.4	122.9	-2.8%	People's Republic of China	9199.1	9087.0	-1.2%
Angola	19.5	19.3	-1.0%	Hong Kong (China)	47.3	47.9	1.3%
Benin	5.7	5.7	0.0%	China (incl. Hong Kong)	9246.4	9134.9	-1.2%
Botswana	6.8	6.9	1.5%	Non-OECD Americas			
Cameroon	6.0	6.0	0.0%	Argentina	195.3	192.4	-1.5%
Congo	2.7	2.6	-3.7%	Bolivia	18.2	18.3	0.5%
Cote d'Ivoire	4.6	4.7	2.2%	Brazil	492.6	476.0	-3.4%
Dem. Rep. of Congo	9.3	9.4	1.1%	Colombia	73.0	72.5	-0.7%
Egypt	181.1	173.3	-4.3%	Costa Rica	7.1	7.2	1.4%
Eritrea	0.6	0.6	0.0%	Cuba	29.6	29.4	-0.7%
Ethiopia	9.2	9.1	-1.1%	Curaçao	3.7	4.7	27.0%
Gabon	3.5	3.5	0.0%	Dominican Republic	19.5	19.3	-1.0%
Ghana	13.3	13.1	-1.5%	Ecuador	38.7	38.7	0.0%
Kenya	12.3	12.4	0.8%	El Salvador	5.9	5.9	0.0%
Libya	48.1	47.9	-0.4%	Guatemala	16.1	16.1	0.0%
Mauritius	3.9	4.0	2.6%	Haiti	2.7	2.8	3.7%
Morocco	53.0	53.1	0.2%	Honduras	8.7	8.7	0.0%
Mozambique	3.8	3.9	2.6%	Jamaica	7.1	7.2	1.4%
Namibia	3.6	3.6	0.0%	Nicaragua	4.5	4.5	0.0%
Niger	2.0	2.0	0.0%	Panama	10.6	10.6	0.0%
Nigeria	61.9	60.2	-2.7%	Paraguay	5.2	5.2	0.0%
Senegal	6.4	6.3	-1.6%	Peru	48.4	47.8	-1.2%
South Africa	442.3	437.4	-1.1%	Suriname	2.0	2.0	0.0%
South Sudan	13.9	13.3	-4.3%	Trinidad and Tobago	38.0	23.2	-38.9%
Sudan	1.5	1.5	0.0%	Uruguay	6.5	6.3	-3.1%
United Rep. of Tanzania	10.4	10.4	0.0%	Venezuela	155.5	155.0	-0.3%
Togo	1.7	1.7	0.0%	Other Non-OECD			
Tunisia	25.0	25.0	0.0%	Americas	19.9	20.1	1.0%
Zambia	3.3	3.2	-3.0%	Non-OECD Americas	1209.0	1173.9	-2.9%
Zimbabwe	11.4	11.5	0.9%	Middle East			
Other Africa	32.3	31.0	-4.0%	Bahrain	31.8	29.7	-6.6%
Africa	1125.6	1105.3	-1.8%	Islamic Republic of Iran	576.1	556.1	-3.5%
Asia (excl. China)				Iraq	140.2	141.0	0.6%
Bangladesh	63.9	62.3	-2.5%	Jordan	23.9	24.1	0.8%
Brunei Darussalam	7.5	6.7	-10.7%	Kuwait	88.4	86.1	-2.6%
Cambodia	6.0	6.1	1.7%	Lebanon	22.1	22.4	1.4%
DPR of Korea	37.0	37.8	2.2%	Oman	63.1	59.9	-5.1%
India	2038.9	2019.7	-0.9%	Qatar	82.7	77.6	-6.2%
Indonesia	442.3	436.5	-1.3%	Saudi Arabia	521.4	506.6	-2.8%
Malaysia	227.5	220.5	-3.1%	Syrian Arab Republic	28.1	27.6	-1.8%
Mongolia	17.8	18.2	2.2%	United Arab Emirates	175.8	175.4	-0.2%
Myanmar	19.6	19.6	0.0%	Yemen	21.1	21.3	0.9%
Nepal	5.8	5.9	1.7%	Middle East	1774.7	1727.8	-2.6%
Pakistan	141.0	137.4	-2.6%				
Philippines	94.5	95.7	1.3%				
Singapore	50.9	45.3	-11.0%				
Sri Lanka	16.5	16.7	1.2%				
Chinese Taipei	260.9	249.7	-4.3%				
Thailand	263.1	243.5	-7.4%				
Viet Nam	143.7	143.3	-0.3%				
Other Asia	41.7	42.1	1.0%				
Asia (excl. China)	3878.8	3807.0	-1.9%				

4. UNITS AND CONVERSIONS

General conversion factors for energy

To:	TJ	Gcal	Mtoe	MBtu	GWh
From:	multiply by:				
terajoule (TJ)	1	2.388x10 ²	2.388x10 ⁻⁵	9.478x10 ²	2.778x10 ⁻¹
gigacalorie (Gcal)	4.187x10 ⁻³	1	1.000x10 ⁻⁷	3.968	1.163x10 ⁻³
million tonnes of oil equivalent (Mtoe)	4.187x10 ⁴	1.000x10 ⁷	1	3.968x10 ⁷	1.163x10 ⁴
million British thermal units (MBtu)	1.055x10 ⁻³	2.520x10 ⁻¹	2.520x10 ⁻⁸	1	2.931x10 ⁻⁴
gigawatt hour (GWh)	3.600	8.598x10 ²	8.598x10 ⁻⁵	3.412x10 ³	1

Conversion factors for mass

To:	kg	t	lt	st	lb
From:	multiply by:				
kilogramme (kg)	1	1.000x10 ⁻³	9.842x10 ⁻⁴	1.102x10 ⁻³	2.205
tonne (t)	1.000x10 ³	1	9.842x10 ⁻¹	1.102	2.205x10 ³
long ton (lt)	1.016x10 ³	1.016	1	1.120	2.240x10 ³
short ton (st)	9.072x10 ²	9.072x10 ⁻¹	8.929x10 ⁻¹	1	2.000x10 ³
pound (lb)	4.536x10 ⁻¹	4.536x10 ⁻⁴	4.464x10 ⁻⁴	5.000x10 ⁻⁴	1

Conversion factors for volume

To:	gal U.S.	gal U.K.	bbl	ft ³	l	m ³
From:	multiply by:					
U.S. gallon (gal U.S.)	1	8.327x10 ⁻¹	2.381x10 ⁻²	1.337x10 ⁻¹	3.785	3.785x10 ⁻³
U.K. gallon (gal U.K.)	1.201	1	2.859x10 ⁻²	1.605x10 ⁻¹	4.546	4.546x10 ⁻³
barrel (bbl)	4.200x10 ¹	3.497x10 ¹	1	5.615	1.590x10 ²	1.590x10 ⁻¹
cubic foot (ft ³)	7.481	6.229	1.781x10 ⁻¹	1	2.832x10 ¹	2.832x10 ⁻²
litre (l)	2.642x10 ⁻¹	2.200x10 ⁻¹	6.290x10 ⁻³	3.531x10 ⁻²	1	1.000x10 ⁻³
cubic metre (m ³)	2.642x10 ²	2.200x10 ²	6.290	3.531x10 ¹	1.000x10 ³	1

Decimal prefixes

10 ¹	deca (da)	10 ⁻¹	deci (d)
10 ²	hecto (h)	10 ⁻²	centi (c)
10 ³	kilo (k)	10 ⁻³	milli (m)
10 ⁶	mega (M)	10 ⁻⁶	micro (μ)
10 ⁹	giga (G)	10 ⁻⁹	nano (n)
10 ¹²	tera (T)	10 ⁻¹²	pico (p)
10 ¹⁵	peta (P)	10 ⁻¹⁵	femto (f)
10 ¹⁸	exa (E)	10 ⁻¹⁸	atto (a)

Tonne of CO₂

The *2006 GLs* and the *UNFCCC Reporting Guidelines on Annual Inventories* both ask that CO₂ emissions be reported in Gg (gigagrammes) of CO₂. A million tonnes of CO₂ is equal to 1 000 Gg of CO₂, so to compare the numbers in this publication with national inventories expressed in Gg, multiply the IEA emissions by 1 000.

Other organisations may present CO₂ emissions in tonnes of carbon instead of tonnes of CO₂. To convert from tonnes of carbon, multiply by 44/12, which is the molecular weight ratio of CO₂ to C.

5. GEOGRAPHICAL COVERAGE

In this publication:

World includes OECD Total; Africa; Non-OECD Americas; Non-OECD Asia (excluding China); China (People's Republic of China and Hong Kong, China); Non-OECD Europe and Eurasia; Middle East; World aviation bunkers and World marine bunkers. It is also the sum of Africa, Americas, Asia, Europe, Oceania, World aviation bunkers and World marine bunkers.

Africa includes Algeria; Angola; Benin; Botswana; Burkina Faso; Burundi; Cabo Verde; Cameroon; Central African Republic; Chad; Comoros; the Republic of the Congo (Congo); Côte d'Ivoire; the Democratic Republic of the Congo; Djibouti; Egypt; Equatorial Guinea; Eritrea; Ethiopia; Gabon; Gambia; Ghana; Guinea; Guinea-Bissau; Kenya; Lesotho; Liberia; Libya; Madagascar; Malawi; Mali; Mauritania; Mauritius; Morocco; Mozambique; Namibia; Niger; Nigeria; Réunion; Rwanda; Sao Tome and Principe; Senegal; the Seychelles; Sierra Leone; Somalia; South Africa; South Sudan (from 2012); Sudan; Swaziland; the United Republic of Tanzania (Tanzania); Togo; Tunisia; Uganda; Zambia; Zimbabwe.

Americas includes Antigua and Barbuda; Argentina; Aruba; the Bahamas; Barbados; Belize; Bermuda; the Plurinational State of Bolivia (Bolivia); Bonaire (from 2012); the British Virgin Islands; Brazil; Canada; the Cayman Islands; Chile; Colombia; Costa Rica; Cuba; Curaçao¹⁹; Dominica; the Dominican Republic; Ecuador; El Salvador; the Falkland Islands (Malvinas); Guatemala; French Guiana; Grenada; Guadeloupe;

19. The Netherlands Antilles was dissolved on 10 October 2010 resulting in two new 'constituent countries' (Curaçao and Sint Maarten) with the other islands joining The Netherlands as "special municipalities". However, due to lack of detailed data the IEA Secretariat's data and estimates under the "Netherlands Antilles" still refer to the whole territory of the Netherlands Antilles as it was known prior to 10 October 2010 up to the end of 2011. Data refer only to the island of Curaçao from 2012. The other islands of the former Netherlands Antilles are added to Other non-OECD Americas from 2012.

Guyana; Haiti; Honduras; Jamaica; Martinique; Mexico; Montserrat; Nicaragua; Panama; Paraguay; Peru; Puerto Rico (for natural gas and electricity)²⁰; Saba (from 2012); Saint Kitts and Nevis; Saint Lucia; Saint Pierre and Miquelon; Saint Vincent and the Grenadines; Sint Eustatius (from 2012); Sint Maarten (from 2012); Suriname; Trinidad and Tobago; the Turks and Caicos Islands; the United States; Uruguay; the Bolivarian Republic of Venezuela (Venezuela).

Asia (from 1990) includes Afghanistan; Armenia; Azerbaijan; Bahrain; Bangladesh; Bhutan; Brunei Darussalam; Cambodia; the People's Republic of China; Cyprus²¹; Georgia; Hong Kong, China; India; Indonesia; the Islamic Republic of Iran; Iraq; Israel²²; Japan; Jordan; the Democratic People's Republic of Korea; Korea; Kazakhstan; Kuwait; Kyrgyzstan; Lao People's Democratic Republic; Lebanon; Macau, China; Malaysia; the Maldives; Mongolia; Myanmar; Nepal; Oman; Pakistan; the Philippines; Qatar; Saudi Arabia; Singapore; Sri Lanka; the Syrian Arab Republic; Tajikistan; Chinese Taipei; Thailand; Timor-Leste; Turkey; Turkmenistan; the United Arab Emirates; Uzbekistan; Viet Nam; and Yemen.

20. Oil statistics as well as coal trade statistics for Puerto Rico are included under the United States.

21. Note by Turkey:

The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

Note by all the European Union member states of the OECD and the European Union:

The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

22. The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Europe (from 1990) includes Albania; Austria; Belarus; Belgium; Bosnia and Herzegovina; Bulgaria; Croatia; the Czech Republic; Denmark; Estonia; Finland; the Former Yugoslav Republic of Macedonia; France; Germany; Gibraltar; Greece; Hungary; Iceland; Ireland; Italy; Kosovo²³; Latvia; Lithuania; Luxembourg; Malta; the Republic of Moldova (Moldova); Montenegro; the Netherlands; Norway; Poland; Portugal; Romania; the Russian Federation; Serbia²⁴; the Slovak Republic; Slovenia; Spain; Sweden; Switzerland; Ukraine; the United Kingdom.

Switzerland; Ukraine; the United Kingdom.

Oceania includes Australia; New Zealand; Cook Islands; Fiji; French Polynesia; Kiribati; New Caledonia; Palau; Papua New Guinea; Samoa; the Solomon Islands; Tonga; Vanuatu.

The **International Energy Agency (IEA)** includes Australia; Austria; Belgium; Canada; the Czech Republic; Denmark; Estonia²⁵; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Japan; Korea; Luxembourg; Mexico; the Netherlands; New Zealand; Norway; Poland; Portugal; the Slovak Republic; Spain; Sweden; Switzerland; Turkey; the United Kingdom; the United States.

The **IEA and Accession/Association countries** includes: IEA member countries: Australia; Austria; Belgium; Canada; the Czech Republic; Denmark; Estonia⁷; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Japan; Korea; Luxembourg; Mexico; the Netherlands; New Zealand; Norway; Poland; Portugal; the Slovak Republic; Spain; Sweden; Switzerland; Turkey; the United Kingdom and the United States; Accession country: Chile; Association countries: Brazil; the People's Republic of China; India; Indonesia; Morocco; Singapore; Thailand.

The **Organisation for Economic Co-Operation and Development (OECD)** includes Australia; Austria; Belgium; Canada; Chile; the Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Iceland; Ireland; Israel; Italy;

Japan; Korea; Latvia²⁶; Luxembourg; Mexico; the Netherlands; New Zealand; Norway; Poland; Portugal; the Slovak Republic; Slovenia; Spain; Sweden; Switzerland; Turkey; the United Kingdom; the United States.

Lithuania was not an OECD Member at the time of preparation of this publication. Accordingly, Lithuania does not appear in the list of OECD Members and is not included in the zone aggregates.

OECD Americas includes Canada; Chile; Mexico; the United States.

OECD Asia Oceania includes Australia; Israel; Japan; Korea; New Zealand.

OECD Europe includes Austria; Belgium; the Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Iceland; Ireland; Italy; Latvia; Luxembourg; the Netherlands; Norway; Poland; Portugal; the Slovak Republic; Slovenia; Spain; Sweden; Switzerland; Turkey; the United Kingdom.

Estonia, Latvia and Slovenia are included starting in 1990. Prior to 1990, Estonia and Latvia are included in Former Soviet Union and Slovenia is included in Former Yugoslavia.

Within the **OECD**:

- **Australia** excludes the overseas territories;
- **Denmark** excludes Greenland and the Faroe Islands, except prior to 1990, where data on oil for Greenland were included with the Danish statistics. The administration is planning to revise the series back to 1974 to exclude these amounts;
- **France** includes Monaco and excludes the following overseas departments: Guadeloupe; French Guiana; Martinique; Mayotte; and Réunion; and collectivities: New Caledonia; French Polynesia; Saint Barthélemy; Saint Martin; Saint Pierre and Miquelon; and Wallis and Futuna;
- **Germany** includes the new federal states of Germany from 1970 onwards;
- The statistical data for **Israel** are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law;

23. This designation is without prejudice to positions on status, and is in line with United Nations Security Council Resolution 1244/99 and the Advisory Opinion of the International Court of Justice on Kosovo's declaration of independence.

24. Serbia includes Montenegro until 2004 and Kosovo until 1999.

25. Estonia is included starting in 1990. Prior to 1990, data for Estonia are included in Former Soviet Union.

26. Latvia is included starting in 1990. Prior to 1990, data for Latvia are included in Former Soviet Union.

- **Italy** includes San Marino and the Holy See;
- **Japan** includes Okinawa;
- **Netherlands** excludes Suriname, Aruba and the other former Netherlands Antilles (Bonaire, Curaçao, Saba, Saint Eustatius and Sint Maarten);
- **Portugal** includes the Azores and Madeira;
- **Spain** includes the Canary Islands;
- **Switzerland** includes Liechtenstein for oil data; data for other fuels do not include Liechtenstein;
- Shipments of coal and oil to the Channel Islands and the Isle of Man from the **United Kingdom** are not classed as exports. Supplies of coal and oil to these islands are, therefore, included as part of UK supply. Exports of natural gas to the Isle of Man are included with the exports to Ireland;
- **United States** includes the 50 states and the District of Columbia but generally excludes all territories, and all trade between the U.S. and its territories. Oil statistics include Guam, Puerto Rico²⁷ and the United States Virgin Islands; trade statistics for coal include international trade to and from Puerto Rico and the United States Virgin Islands.

Non-OECD Europe and Eurasia includes Albania; Armenia; Azerbaijan; Belarus; Bosnia and Herzegovina; Bulgaria; Croatia; Cyprus²¹; the Former Yugoslav Republic of Macedonia; Georgia; Gibraltar; Kazakhstan; Kosovo²³; Kyrgyzstan; Lithuania²⁸; Malta; the Republic of Moldova (Moldova); Montenegro; Romania; the Russian Federation; Serbia²⁴; Tajikistan; Turkmenistan; Ukraine; Uzbekistan; the Former Soviet Union; the Former Yugoslavia.

Non-OECD Asia excluding China includes Bangladesh; Brunei Darussalam; Cambodia (from 1995); India; Indonesia; the Democratic People's Republic of Korea; Malaysia; Mongolia (from 1985); Myanmar; Nepal; Pakistan; the Philippines; Singapore; Sri Lanka; Chinese Taipei; Thailand; Viet Nam; **Other non-OECD Asia**.

China includes the (People's Republic of) China; Hong Kong, China.

Non-OECD Americas includes Argentina; the Plurinational State of Bolivia (Bolivia); Brazil; Colombia; Costa Rica; Cuba; Curaçao¹⁹; the Dominican Republic; Ecuador; El Salvador; Guatemala; Haiti; Honduras; Jamaica; Nicaragua; Panama; Paraguay; Peru; Suriname (from 2000), Trinidad and Tobago; Uruguay; the Bolivarian Republic of Venezuela (Venezuela); **Other non-OECD Americas**.

Middle East includes Bahrain; the Islamic Republic of Iran; Iraq; Jordan; Kuwait; Lebanon; Oman; Qatar; Saudi Arabia; the Syrian Arab Republic; the United Arab Emirates; Yemen.

Other Africa includes Botswana (until 1980); Burkina Faso; Burundi; Cabo Verde; Central African Republic; Chad; Comoros; Djibouti; Equatorial Guinea; Gambia; Guinea; Guinea-Bissau; Lesotho; Liberia; Madagascar; Malawi; Mali; Mauritania; Namibia (until 1990); Niger (until 1999); Réunion; Rwanda; Sao Tome and Principe; the Seychelles; Sierra Leone; Somalia; Swaziland; Uganda.

Other non-OECD Americas includes Anguilla, Antigua and Barbuda; Aruba; the Bahamas; Barbados; Belize; Bermuda; Bonaire (from 2012); the British Virgin Islands; the Cayman Islands; Dominica; the Falkland Islands (Malvinas); the French Guiana; Grenada; Guadeloupe; Guyana; Martinique; Montserrat; Puerto Rico (for natural gas and electricity)²⁷; Saba (from 2012); Saint Eustatius (from 2012); Saint Kitts and Nevis; Saint Lucia; Saint Pierre and Miquelon; Saint Vincent and the Grenadines; Sint Maarten (from 2012); Suriname (until 1999); the Turks and Caicos Islands.

Other non-OECD Asia includes Afghanistan; Bhutan; Cambodia (until 1994); Cook Islands; Fiji; French Polynesia; Kiribati; Lao People's Democratic Republic; Macau, China; the Maldives; Mongolia (until 1984); New Caledonia; Palau (from 1994); Papua New Guinea; Samoa; the Solomon Islands; Timor-Leste; Tonga; Vanuatu.

The **European Union - 28 (EU-28)** (from 1990) includes Austria; Belgium; Bulgaria; Croatia; Cyprus²¹; the Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Latvia; Lithuania; Luxembourg; Malta; the Netherlands; Poland; Portugal; Romania; the Slovak Republic; Slovenia; Spain; Sweden; the United Kingdom.

Please note that in the interest of having comparable data, all these countries are included since 1990 despite different entry dates into the European Union.

27. Natural gas and electricity data for Puerto Rico are included under Other non-OECD Americas.

28. Lithuania was not an OECD Member at the time of preparation of this publication. Accordingly, Lithuania does not appear in the list of OECD Members and is still included in the non-OECD aggregates.

G20 includes Argentina; Australia; Brazil; Canada; China (including Hong Kong, China); India; Indonesia; Japan; Korea; Mexico; the Russian Federation; Saudi Arabia; South Africa; Turkey; the United States; the European Union – 28.

The **Organisation of the Petroleum Exporting Countries (OPEC)** includes Algeria; Angola; Ecuador; Gabon; the Islamic Republic of Iran; Iraq; Kuwait; Libya; Nigeria; Qatar; Saudi Arabia; the United Arab Emirates; the Bolivarian Republic of Venezuela (Venezuela).²⁹

Annex I Parties³⁰ includes Australia, Austria, Belarus, Belgium, Bulgaria, Canada, Croatia, Cyprus³¹, the Czech Republic^{32,33}, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein (not available in this publication)³⁴, Lithuania, Luxembourg, Malta, Monaco (included with France), the Netherlands, New Zealand, Norway, Poland, Portugal, Romania, the Russian Federation, the Slovak Republic^{33,35}, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom and the United States.

The countries that are listed above are included in Annex I of the United Nations Framework Convention on Climate Change as amended on 11 December 1997 by the 12th Plenary meeting of the Third Conference of the Parties in Decision 4/CP.3. This includes the countries that were members of the OECD at the time of the signing of the Convention, the EEC, and fourteen countries in Central and Eastern Europe and the Former Soviet Union that were undergoing the process of transition to market economies. During subsequent sessions, the Conference of the Parties agreed to amend Annex I to the Convention to include Malta (Decision 3/CP.15, effective from 26 October 2010) and Cyprus³⁶ (Decision 10/CP.17, effective from 9 January 2013).

29. Data for Equatorial Guinea, that joined OPEC in May 2017, and for Congo, that joined OPEC in June 2018, are not included in the OPEC aggregate in this edition.

30. The European Union is also an Annex I Party in its own right. The EU was assigned an overall reduction target under the Kyoto Protocol, which by agreement, was used to determine the individual targets of the fifteen states that were EU members in 1997 when the Kyoto Protocol was adopted.

31. Refer to the country note for Cyprus earlier in this chapter.

32. Czechia in official UN documents.

33. Czechoslovakia was in the original list of Annex I countries.

34. Oil data for Liechtenstein are included under Switzerland.

35. Slovakia in official UN documents.

36. Refer to the country note for Cyprus earlier in this chapter.

Annex II Parties includes Australia, Austria, Belgium, Canada, Denmark, Finland, France³⁷, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland³⁸, the United Kingdom and the United States.

According to Decision 26/CP.7 in document FCCC/CP/2001/13/Add.4, Turkey has been deleted from the list of Annex II countries to the Convention. This amendment entered into force on 28 June 2002.

Annex II North America includes Canada and the United States.

Annex II Europe includes Austria, Belgium, Denmark, Finland, France³⁷, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland³⁸ and the United Kingdom.

Annex II Asia Oceania includes Australia, Japan and New Zealand.

Annex I: Economies in Transition (EIT) are those countries in Annex I that were undergoing the process of transition to a market economy. This includes Belarus, Bulgaria, Croatia, the Czech Republic^{32,33}, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, the Russian Federation, the Slovak Republic^{33,35}, Slovenia and Ukraine.

Annex B Kyoto Parties³⁰ includes Australia, Austria, Belarus, Belgium, Bulgaria, Croatia, Cyprus³⁶, the Czech Republic^{32,33}, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Kazakhstan, Latvia, Liechtenstein (not available in this publication) Lithuania, Luxembourg, Malta, Monaco (included with France), the Netherlands, Norway, Poland, Portugal, Romania, the Slovak Republic^{33,35}, Slovenia, Spain, Sweden, Switzerland, Ukraine and the United Kingdom.

Refers to countries with emissions targets under the second commitment period (CP) of the Kyoto Protocol (2013-2020) as per the Doha Amendment. This differs from the list of countries with targets under the first CP (2008-2012). Please note that the Doha Amendment has not yet entered into force. Membership of Annex B in the second CP of the Kyoto Protocol differs from that in Annex I. In particular, Annex B excludes, or does not contain targets for Canada, Japan, New Zealand, the Russian Federation, Turkey and

37. In IEA data, France also includes Monaco, which is not in the list of Annex II Parties.

38. In IEA data, Switzerland includes Oil data for Liechtenstein, which is not in the list of Annex II Parties.

the United States (all Annex I member states), but includes Kazakhstan (a non-Annex I Party under the Convention, but an Annex I Party under the Kyoto Protocol (as per decision 9/CMP.8)).

Please note that the following countries have not been considered:

- **Non-OECD Europe and Eurasia:** Andorra; Faroe Islands (after 1990); Liechtenstein (except for oil data); the Palestinian Authority; Svalbard; Jan Mayen Islands;
- **Africa:** British Indian Ocean Territory; French Southern and Antarctic Lands; Mayotte; Saint Helena; Western Sahara;
- **Non-OECD Americas:** Anguilla; Bouvet Island; Saint Barthélemy; Greenland (after 1990); Saint Martin (French Part); South Georgia and the South Sandwich Islands;
- Antarctica;
- **Non-OECD Asia excluding China:** American Samoa; Cocos (Keeling) Islands; Christmas Island; Heard Island and McDonald Islands; Marshall Islands; Micronesia (Federated States of); Nauru; Niue; Norfolk Island; Northern Mariana Islands; Pitcairn; Tokelau; Tuvalu; United States Minor Outlying Islands; Wallis and Futuna Islands.

PART II

CO₂ EMISSIONS STATISTICS AND INDICATORS

CO₂ EMISSIONS STATISTICS AND INDICATORS

SUMMARY TABLES

CO₂ emissions from fuel combustion

 million tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
World ¹	13 945.3	15 486.9	17 708.8	18 249.6	20 518.2	21 379.6	23 223.4	27 069.7	30 489.9	32 276.0	32 314.2	57.5%
<i>Annex I Parties</i>	..	..	..	..	13 719.3	12 986.3	13 619.4	13 858.0	13 224.1	12 332.1	12 239.8	-10.8%
<i>Annex II Parties</i>	8 580.8	8 845.0	9 419.3	9 072.9	9 654.2	10 032.4	10 896.4	11 087.4	10 397.8	9 670.4	9 563.6	-0.9%
<i>North America</i>	4 629.3	4 732.9	5 018.1	4 908.2	5 222.7	5 522.9	6 246.1	6 243.3	5 881.6	5 461.4	5 373.8	2.9%
<i>Europe</i>	3 043.6	3 066.3	3 307.4	3 059.4	3 113.0	3 088.4	3 161.9	3 274.9	2 992.6	2 646.0	2 619.8	-15.8%
<i>Asia Oceania</i>	907.9	1 045.8	1 093.8	1 105.3	1 318.6	1 421.2	1 488.3	1 569.3	1 523.6	1 563.1	1 569.9	19.1%
<i>Annex I EIT</i>	..	..	..	..	3 930.1	2 792.4	2 513.3	2 545.0	2 548.6	2 335.2	2 329.9	-40.7%
<i>Non-Annex I Parties</i>	..	..	..	..	6 168.3	7 674.7	8 749.9	12 217.5	16 145.6	18 750.0	18 834.3	205.3%
<i>Annex B Kyoto Parties</i>	..	..	..	..	5 382.7	4 795.8	4 656.0	4 876.5	4 632.0	4 126.7	4 141.0	-23.1%
Intl. aviation bunkers	169.2	173.9	202.1	224.9	258.9	290.3	355.6	422.7	457.6	531.8	557.7	115.4%
Intl. marine bunkers	353.9	341.1	357.1	306.3	371.7	428.2	498.4	571.5	662.7	662.2	682.4	83.6%
Non-OECD Total	4 078.3	5 214.2	6 566.0	7 377.5	8 870.8	9 151.1	9 840.3	13 242.5	17 031.7	19 433.4	19 482.7	119.6%
OECD Total	9 344.0	9 757.7	10 583.7	10 340.9	11 016.7	11 509.9	12 529.1	12 833.0	12 338.0	11 648.7	11 591.4	5.2%
Canada	340.2	377.1	422.3	393.9	419.6	449.0	516.3	540.0	529.5	541.8	540.8	28.9%
Chile	21.0	17.1	21.4	19.6	29.4	37.1	48.6	54.4	68.6	81.2	85.3	189.8%
Mexico	93.7	134.6	204.6	241.2	257.0	291.3	359.7	412.4	440.5	442.4	445.5	73.4%
United States	4 289.0	4 355.8	4 595.8	4 514.3	4 803.1	5 073.9	5 729.9	5 703.2	5 352.1	4 919.6	4 833.1	0.6%
OECD Americas	4 744.1	4 884.6	5 244.1	5 169.0	5 509.1	5 851.3	6 654.5	6 710.1	6 390.7	5 985.0	5 904.6	7.2%
Australia	143.4	179.5	206.7	220.1	259.7	285.3	334.6	371.9	389.1	379.3	392.4	51.1%
Israel ²	13.8	16.4	18.9	24.3	32.8	44.9	54.8	58.8	68.4	64.4	63.7	94.2%
Japan	751.0	849.9	870.6	866.2	1 037.1	1 111.9	1 124.7	1 163.7	1 104.2	1 152.6	1 147.1	10.6%
Korea	52.9	77.7	125.6	155.7	231.8	357.3	431.9	457.7	550.9	582.0	589.2	154.2%
New Zealand	13.5	16.4	16.5	18.9	21.8	23.9	29.0	33.7	30.4	31.2	30.5	40.0%
OECD Asia Oceania	974.6	1 139.9	1 238.3	1 285.3	1 583.2	1 823.4	1 975.1	2 085.8	2 143.0	2 209.5	2 222.9	40.4%
Austria	48.6	49.5	54.4	52.6	56.2	59.5	61.8	74.3	68.3	62.5	62.9	11.8%
Belgium	118.0	115.6	125.5	101.0	106.3	111.5	113.8	107.4	103.7	92.6	91.6	-13.9%
Czech Republic	153.5	155.0	168.0	175.3	150.2	123.2	121.2	118.4	112.6	99.6	101.4	-32.5%
Denmark	55.4	52.6	63.1	61.0	51.0	58.4	50.8	48.5	47.3	32.0	33.5	-34.4%
Estonia	..	..	..	..	35.0	15.9	14.4	16.7	18.6	15.1	16.4	-53.2%
Finland	39.9	44.2	54.9	48.3	53.8	55.7	54.6	54.9	62.0	42.4	45.5	-15.4%
France	423.4	423.1	455.2	351.8	345.6	343.6	364.7	371.9	341.0	292.2	292.9	-15.2%
Germany	978.1	973.4	1 048.2	1 004.3	940.0	856.6	812.3	786.7	758.8	729.7	731.6	-22.2%
Greece	25.1	34.1	45.2	54.5	69.9	76.5	87.9	95.2	83.4	64.5	63.1	-9.7%
Hungary	60.3	70.2	82.6	79.8	65.7	56.2	53.3	54.7	47.1	42.7	43.9	-33.1%
Iceland	1.4	1.6	1.7	1.6	1.9	2.0	2.2	2.2	1.9	2.1	2.1	8.9%
Ireland	21.6	21.1	25.9	26.5	30.1	32.6	40.9	44.4	39.5	35.4	36.9	22.4%
Italy	289.4	317.1	355.4	342.0	389.4	401.1	420.4	456.4	392.0	329.7	325.7	-16.4%
Latvia	..	..	..	..	18.8	8.9	6.8	7.6	8.1	6.8	6.8	-63.8%
Luxembourg	16.5	12.7	12.5	10.3	10.7	8.2	8.1	11.5	10.6	8.8	8.5	-21.1%
Netherlands	127.7	132.0	145.4	138.4	147.8	163.6	161.6	167.2	170.1	156.1	157.1	6.3%
Norway	23.0	23.6	27.2	26.4	27.5	31.4	31.9	34.5	38.4	36.1	35.5	29.3%
Poland	287.4	338.9	416.0	422.4	344.8	333.3	289.6	296.3	307.5	282.7	293.1	-15.0%
Portugal	14.4	18.0	23.8	23.9	37.9	47.2	57.9	61.4	47.6	47.0	47.4	25.0%
Slovak Republic	38.9	43.2	55.8	54.4	54.8	41.2	36.9	37.3	34.6	29.4	30.2	-44.9%
Slovenia	..	..	..	..	13.5	14.1	14.1	15.4	15.4	12.8	13.6	0.4%
Spain	119.1	155.8	186.3	173.0	202.6	228.2	278.6	333.7	262.1	247.1	238.6	17.8%
Sweden	82.0	79.0	73.1	58.4	52.1	56.9	52.0	49.1	46.1	37.1	38.0	-27.0%
Switzerland	38.9	36.8	39.3	41.8	40.7	41.5	42.0	44.0	43.3	37.3	37.9	-6.9%
Turkey	41.7	59.6	71.5	95.4	128.8	154.0	201.2	215.9	267.8	319.0	338.8	163.1%
United Kingdom	621.1	576.0	570.6	543.5	549.4	513.8	520.6	531.6	476.6	393.5	371.1	-32.4%
OECD Europe	3 625.3	3 733.1	4 101.3	3 886.6	3 924.5	3 835.2	3 899.5	4 037.2	3 804.3	3 454.2	3 464.0	-11.7%
<i>IEA/Accession/Association</i>	10 525.3	11 327.4	12 690.3	12 873.8	14 272.7	15 970.6	17 567.1	20 546.4	23 103.5	24 387.5	24 301.1	70.3%
<i>European Union - 28</i>	..	..	..	..	4 027.2	3 812.3	3 786.1	3 921.7	3 612.4	3 206.6	3 192.3	-20.7%
<i>G20</i>	..	..	..	..	16 791.9	17 724.2	19 185.9	22 237.2	24 922.3	26 220.5	26 099.8	55.4%
<i>Africa</i>	249.0	324.0	397.7	465.7	529.1	576.4	658.3	857.4	995.4	1 141.0	1 157.6	118.8%
<i>Americas</i>	5 081.6	5 293.1	5 750.6	5 653.3	6 062.5	6 504.0	7 435.2	7 566.6	7 410.5	7 122.4	7 003.4	15.5%
<i>Asia</i>	2 160.4	2 707.0	3 453.0	4 100.4	5 832.8	7 312.1	8 147.3	11 317.9	14 892.1	17 316.9	17 426.7	198.8%
<i>Europe</i>	3 766.7	3 892.5	4 300.1	4 056.5	7 176.2	5 953.3	5 757.6	5 917.5	5 642.0	5 076.6	5 048.6	-29.6%
<i>Oceania</i>	161.1	201.1	228.4	244.6	286.9	315.2	370.9	416.2	429.7	425.2	437.8	52.6%

1. Total world includes non-OECD total, OECD total as well as international marine bunkers and international aviation bunkers.

2. Please refer to the chapter Geographical coverage.

CO₂ emissions from fuel combustionmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Non-OECD Total	4 078.3	5 214.2	6 566.0	7 377.5	8 870.8	9 151.1	9 840.3	13 242.5	17 031.7	19 433.4	19 482.7	119.6%
Albania	3.9	4.3	6.8	6.9	5.7	1.8	3.1	3.8	3.9	3.8	3.7	-35.2%
Armenia	..	..	..	..	19.8	3.4	3.4	4.1	4.0	4.7	4.9	-75.5%
Azerbaijan	..	..	..	..	53.5	32.4	27.3	29.0	23.5	30.8	31.4	-41.3%
Belarus	..	..	..	..	99.9	57.0	52.1	55.0	59.5	52.7	53.1	-46.8%
Bosnia and Herzegovina	..	..	..	..	24.0	3.3	13.7	15.9	20.5	19.2	22.0	-8.4%
Bulgaria	63.8	73.3	85.0	82.2	74.5	52.7	42.2	46.5	44.4	43.7	40.5	-45.7%
Croatia	..	..	..	..	20.3	14.8	16.8	19.9	18.2	15.5	15.9	-22.0%
Cyprus ¹	1.7	1.7	2.6	2.8	3.9	5.0	6.3	7.0	7.3	5.9	6.3	61.1%
FYR of Macedonia	..	..	..	..	8.6	8.3	8.5	8.9	8.3	7.1	6.9	-19.6%
Georgia	..	..	..	..	33.5	8.1	4.6	4.1	5.0	8.4	8.8	-73.7%
Gibraltar	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.4	0.5	0.6	0.6	352.3%
Kazakhstan	..	..	..	..	237.3	170.5	112.0	156.9	221.1	225.1	230.0	-3.1%
Kosovo	..	..	..	..	..	..	5.1	6.6	8.7	8.6	9.1	..
Kyrgyzstan	..	..	..	..	22.8	4.5	4.5	4.9	6.0	9.9	9.3	-59.2%
Lithuania	..	..	..	..	32.2	13.4	10.2	12.4	12.3	10.6	10.8	-66.6%
Malta	0.7	0.7	1.0	1.2	2.3	2.4	2.1	2.6	2.6	1.6	1.4	-41.5%
Republic of Moldova	..	..	..	..	30.5	11.9	6.5	7.8	7.9	7.6	7.7	-74.7%
Montenegro	..	..	..	..	..	..	..	2.0	2.6	2.4	2.1	..
Romania	114.7	140.6	177.4	174.9	168.3	117.6	86.2	92.6	74.7	69.5	67.9	-59.7%
Russian Federation	..	..	..	..	2 163.5	1 548.2	1 474.4	1 481.9	1 529.2	1 466.3	1 438.6	-33.5%
Serbia	..	..	..	..	61.9	44.5	42.9	49.5	45.8	44.5	45.5	-26.5%
Tajikistan	..	..	..	..	11.0	2.5	2.2	2.3	2.3	4.2	4.8	-56.7%
Turkmenistan	..	..	..	..	44.6	33.3	36.7	48.1	56.9	69.1	69.0	54.5%
Ukraine	..	..	..	..	688.6	395.8	295.1	290.2	266.3	187.6	197.7	-71.3%
Uzbekistan	..	..	..	..	114.9	94.6	114.0	107.2	97.6	88.6	85.3	-25.7%
Former Soviet Union	1 941.7	2 480.7	2 935.7	3 078.3	..	..	..	..	..	..	..	..
Former Yugoslavia	61.8	73.5	84.2	119.6	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia	2 188.3	2 774.8	3 292.7	3 465.9	3 921.8	2 626.3	2 370.3	2 459.9	2 529.3	2 388.0	2 373.0	-39.5%
Algeria	8.6	13.6	27.7	42.1	51.2	55.3	61.5	77.5	95.5	130.4	127.6	149.4%
Angola	1.6	2.0	2.7	2.8	3.9	3.9	4.6	6.1	15.1	19.8	19.6	398.5%
Benin	0.3	0.5	0.4	0.5	0.3	0.2	1.4	2.7	4.6	5.3	5.7	+
Botswana	..	..	..	1.5	2.8	3.2	4.0	4.3	3.3	7.1	7.0	147.7%
Cameroon	0.7	1.0	1.7	2.4	2.6	2.5	2.8	2.9	5.1	5.9	6.1	131.2%
Congo	0.6	0.6	0.7	0.8	0.6	0.5	0.5	0.8	1.8	2.7	2.6	314.8%
Côte d'Ivoire	2.4	3.0	3.4	3.0	2.7	3.3	6.3	5.8	6.2	9.7	10.3	280.9%
Dem. Rep. of the Congo	2.6	2.6	3.2	3.3	3.0	1.1	0.9	1.3	1.9	2.7	2.0	-33.8%
Egypt	20.1	25.6	40.8	64.5	77.9	81.7	99.7	144.7	176.5	199.6	204.8	163.0%
Eritrea	..	..	..	..	..	0.8	0.6	0.6	0.5	0.6	0.6	..
Ethiopia	1.3	1.2	1.4	1.4	2.2	2.3	3.2	4.5	6.0	10.2	10.9	403.4%
Gabon	0.5	0.8	1.3	1.7	0.9	1.3	1.5	1.7	2.7	3.2	3.4	268.3%
Ghana	1.9	2.3	2.2	2.1	2.5	3.2	5.0	6.4	10.5	14.1	12.8	403.2%
Kenya	3.2	3.5	4.4	4.6	5.5	5.7	7.8	7.5	11.2	14.1	15.7	184.5%
Libya	3.7	8.7	17.6	21.2	25.8	33.0	36.8	43.0	48.1	41.9	43.3	67.5%
Mauritius	0.3	0.4	0.6	0.6	1.2	1.6	2.4	3.0	3.7	4.0	4.0	246.7%
Morocco	6.6	9.7	13.7	16.3	19.7	26.1	29.6	39.2	46.4	55.4	55.3	181.3%
Mozambique	2.9	2.4	2.3	1.5	1.1	1.1	1.3	1.5	2.4	5.1	7.2	566.6%
Namibia	..	..	..	..	..	1.8	1.9	2.5	3.1	3.8	4.1	..
Niger	..	..	..	..	..	..	0.6	0.7	1.4	2.0	1.9	..
Nigeria	5.7	10.8	25.4	31.8	28.1	32.8	43.8	56.6	54.9	82.7	86.0	206.4%
Senegal	1.2	1.6	2.0	2.1	2.1	2.5	3.5	4.6	5.5	7.5	8.2	282.5%
South Africa	157.1	203.0	208.4	223.0	243.8	259.8	280.5	372.3	406.9	410.1	414.4	69.9%
South Sudan	..	..	..	..	..	..	..	..	..	2.0	1.8	..
Sudan	3.2	3.2	3.7	4.0	5.3	4.3	5.5	9.9	15.0	15.6	18.9	256.4%
United Rep. of Tanzania	1.4	1.4	1.5	1.5	1.7	2.5	2.6	5.1	6.1	11.6	10.6	533.9%
Togo	0.3	0.3	0.4	0.3	0.6	0.6	0.9	1.0	2.1	1.9	2.0	239.7%
Tunisia	3.7	4.8	7.9	9.7	12.2	14.0	17.6	19.5	23.3	25.6	25.2	106.4%
Zambia	3.4	4.3	3.3	2.7	2.6	2.0	1.7	2.1	1.6	3.3	3.6	42.3%
Zimbabwe	7.2	7.2	8.0	9.7	16.2	15.1	13.3	10.3	9.3	11.8	10.3	-36.4%
Other Africa	8.4	9.6	13.3	10.9	12.6	14.2	16.4	19.4	25.0	31.3	31.8	151.9%
Africa	249.0	324.0	397.7	465.7	529.1	576.4	658.3	857.4	995.4	1 141.0	1 157.6	118.8%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions from fuel combustionmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Bangladesh	2.9	4.4	6.6	7.7	11.4	16.5	20.9	32.0	49.9	70.9	73.3	541.9%
Brunei Darussalam	0.4	1.4	2.6	2.9	3.3	4.5	4.4	4.8	6.9	6.0	6.3	93.9%
Cambodia	..	..	..	..	..	1.5	2.0	2.6	4.6	8.0	9.3	..
DPR of Korea	69.2	78.6	108.1	129.4	116.8	76.5	70.0	75.3	49.3	22.5	25.4	-78.2%
India	181.1	217.2	263.3	376.2	529.1	703.3	884.7	1 072.1	1 580.6	2 026.1	2 076.8	292.6%
Indonesia	25.2	37.8	67.6	84.2	134.2	204.2	255.4	318.6	362.0	454.6	454.9	238.9%
Malaysia	12.8	16.2	23.7	32.9	49.6	79.6	115.1	155.8	189.9	220.4	216.2	335.8%
Mongolia	..	..	..	11.8	12.8	10.2	9.0	11.0	14.1	17.1	18.0	39.9%
Myanmar	4.5	3.9	5.1	5.7	3.9	6.7	9.3	10.5	7.9	18.7	21.1	438.8%
Nepal	0.2	0.3	0.5	0.6	0.9	1.8	3.1	3.1	4.1	5.7	8.5	849.6%
Pakistan	15.9	20.0	24.3	36.5	56.0	79.2	94.4	115.0	129.6	150.8	153.4	174.0%
Philippines	23.8	29.2	32.6	29.3	38.1	57.3	68.1	71.5	77.1	103.9	114.8	201.6%
Singapore	6.1	8.4	12.7	16.6	29.0	37.6	42.1	37.9	44.3	44.2	45.3	56.2%
Sri Lanka	2.8	2.6	3.6	3.5	3.7	5.5	10.5	13.4	12.4	19.5	20.9	468.5%
Chinese Taipei	29.8	40.7	71.4	69.1	111.1	154.0	214.4	254.0	256.4	250.7	257.8	132.0%
Thailand	16.2	21.2	33.7	42.1	80.9	139.9	152.3	200.2	223.4	248.1	244.6	202.4%
Viet Nam	16.3	17.0	14.9	17.4	17.4	27.5	44.2	79.1	126.1	168.7	187.1	976.0%
Other non-OECD Asia	10.6	12.8	16.7	10.2	10.3	9.3	11.4	15.6	22.1	36.8	51.4	401.3%
Asia (excl. China)	417.6	511.8	687.5	876.1	1 208.4	1 615.1	2 011.3	2 472.5	3 160.9	3 872.8	3 985.0	229.8%
People's Rep. of China	780.2	1 029.3	1 363.8	1 626.0	2 088.9	2 900.3	3 099.7	5 406.5	7 791.6	9 102.7	9 056.8	333.6%
Hong Kong, China	9.2	10.9	14.6	22.3	33.3	36.5	40.3	41.3	42.0	43.9	44.7	34.3%
China	789.4	1 040.2	1 378.4	1 648.3	2 122.2	2 936.8	3 140.0	5 447.8	7 833.6	9 146.6	9 101.5	328.9%
Argentina	82.5	85.2	95.2	87.8	99.4	117.3	139.4	149.5	173.8	190.4	190.6	91.7%
Bolivia	2.2	3.2	4.2	4.3	5.2	6.9	7.1	9.1	13.7	18.2	20.2	291.9%
Brazil	87.5	129.6	167.8	156.2	184.3	227.8	292.4	310.6	370.6	451.5	416.7	126.1%
Colombia	26.7	28.3	34.8	39.5	45.8	54.5	54.2	53.6	60.2	78.3	85.9	87.5%
Costa Rica	1.3	1.7	2.2	1.9	2.6	4.4	4.5	5.4	6.6	6.9	7.5	187.3%
Cuba	20.8	24.2	30.5	32.2	34.1	22.4	27.3	25.1	29.5	26.8	23.3	-31.8%
Curaçao ¹	14.5	10.2	8.7	4.5	2.7	2.6	5.6	6.0	4.4	4.7	4.1	55.7%
Dominican Republic	3.5	5.2	6.3	6.2	7.4	11.2	17.6	17.4	19.0	21.5	22.4	202.2%
Ecuador	3.5	5.9	10.4	11.7	13.3	16.7	18.1	23.9	32.1	36.8	35.0	162.9%
El Salvador	1.3	1.9	1.6	1.6	2.1	4.6	5.2	6.3	5.8	6.5	6.8	220.8%
Guatemala	2.3	3.0	4.2	3.2	3.2	5.9	8.6	10.6	10.3	15.2	16.3	406.8%
Haiti	0.4	0.4	0.6	0.8	0.9	0.9	1.4	2.0	2.1	3.2	3.3	247.9%
Honduras	1.1	1.3	1.7	1.7	2.2	3.6	4.5	7.2	7.5	9.2	9.1	319.3%
Jamaica	5.5	7.4	6.5	4.7	7.2	8.4	9.8	10.3	6.9	7.0	7.2	-0.2%
Nicaragua	1.5	1.8	1.8	1.8	1.8	2.5	3.5	4.0	4.3	5.1	5.3	188.3%
Panama	2.5	3.1	2.9	2.7	2.6	4.1	4.9	6.8	8.8	10.7	10.2	296.2%
Paraguay	0.6	0.7	1.3	1.4	1.9	3.5	3.3	3.5	4.7	5.7	6.4	232.0%
Peru	15.4	18.2	20.4	18.1	19.2	23.3	26.4	28.6	41.1	48.8	51.3	168.0%
Suriname	..	..	..	..	..	..	1.5	1.7	1.7	2.1	1.9	..
Trinidad and Tobago	5.4	4.6	6.4	6.7	7.9	8.2	10.1	17.5	22.4	21.7	21.1	167.2%
Uruguay	5.1	5.3	5.3	3.0	3.6	4.4	5.1	5.2	6.0	6.4	6.3	75.7%
Venezuela	45.9	56.1	83.4	85.1	93.6	106.1	116.2	137.7	171.5	140.5	127.4	36.1%
Other non-OECD Americas	8.2	10.9	10.3	9.2	12.4	13.4	14.1	14.7	17.0	20.3	20.6	66.2%
Non-OECD Americas	337.5	408.5	506.5	484.3	553.5	652.7	780.7	856.5	1 019.9	1 137.4	1 098.8	98.5%
Bahrain	2.9	5.2	7.2	9.1	10.7	13.5	15.8	20.6	25.6	30.1	29.6	177.5%
Islamic Republic of Iran	38.9	68.0	88.5	145.0	171.2	244.6	312.3	417.8	498.6	553.3	563.4	229.0%
Iraq	10.3	15.5	26.2	38.0	52.4	95.1	70.5	73.2	103.9	130.4	139.9	166.9%
Jordan	1.4	2.2	4.3	7.5	9.2	12.2	14.2	17.9	18.8	23.8	23.9	160.1%
Kuwait	14.0	15.1	26.4	36.7	27.8	32.4	46.3	64.8	77.0	90.6	90.2	224.4%
Lebanon	4.6	5.7	6.7	6.6	5.5	12.8	14.0	14.5	18.2	22.8	23.2	320.7%
Oman	0.3	0.7	2.2	5.6	10.2	14.7	20.4	25.2	42.4	63.6	63.1	521.3%
Qatar	2.2	4.9	7.0	10.7	12.4	16.8	21.3	33.2	55.5	77.6	79.1	536.0%
Saudi Arabia	12.7	22.5	99.4	117.8	151.1	191.7	234.6	298.0	419.2	531.6	527.2	248.9%
Syrian Arab Republic	5.4	8.3	12.3	19.5	27.2	31.1	37.0	53.5	56.6	26.0	26.1	-4.2%
United Arab Emirates	2.5	4.9	19.2	35.6	51.9	69.7	79.9	111.1	154.6	186.6	191.8	269.7%
Yemen	1.2	1.8	3.5	4.9	6.3	9.4	13.3	18.8	22.4	11.4	9.2	46.4%
Middle East	96.4	154.9	303.1	437.1	536.0	743.9	879.7	1 148.5	1 492.7	1 747.6	1 766.7	229.6%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions from fuel combustion - coalmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
World ¹	5 229.1	5 647.6	6 601.2	7 394.0	8 297.6	8 519.7	8 951.1	11 469.5	13 783.2	14 536.3	14 265.3	71.9%
<i>Annex I Parties</i>	..	..	..	..	5 222.8	4 690.4	4 784.1	4 816.6	4 481.3	3 786.1	3 583.8	-31.4%
<i>Annex II Parties</i>	2 704.6	2 668.3	3 033.8	3 392.9	3 559.1	3 474.5	3 711.1	3 784.5	3 419.1	2 850.9	2 648.1	-25.6%
<i>North America</i>	1 169.7	1 285.2	1 515.6	1 762.9	1 933.3	2 039.3	2 297.9	2 290.5	2 074.8	1 539.3	1 427.5	-26.2%
<i>Europe</i>	1 254.1	1 080.5	1 209.2	1 251.5	1 183.6	950.1	865.4	866.8	723.5	686.5	597.3	-49.5%
<i>Asia Oceania</i>	280.8	302.6	309.0	378.5	442.1	485.1	547.8	627.1	620.8	625.0	623.4	41.0%
<i>Annex I EIT</i>	..	..	..	..	1 601.5	1 151.1	981.3	943.4	936.6	799.7	784.1	-51.0%
<i>Non-Annex I Parties</i>	..	..	..	..	3 074.8	3 829.3	4 166.9	6 652.8	9 301.9	10 750.2	10 681.4	247.4%
<i>Annex B Kyoto Parties</i>	..	..	..	..	2 378.5	1 888.4	1 668.6	1 707.6	1 594.8	1 437.4	1 356.0	-43.0%
Intl. aviation bunkers	x	x	x	x	x	x	x	x	x	x	x	x
Intl. marine bunkers	0.1	x	x	x	x	x	x	x	x	x	x	x
Non-OECD Total	2 028.8	2 440.9	2 917.9	3 272.2	4 055.4	4 404.6	4 548.0	6 967.8	9 519.2	10 836.6	10 768.5	165.5%
OECD Total	3 200.2	3 206.7	3 683.3	4 121.8	4 242.3	4 115.1	4 403.0	4 501.7	4 264.0	3 699.7	3 496.8	-17.6%
Canada	63.9	59.0	82.1	100.8	96.2	100.7	125.9	111.3	92.6	74.1	71.3	-25.8%
Chile	5.1	3.6	4.8	5.0	9.8	8.9	11.7	10.3	17.5	27.8	29.3	199.3%
Mexico	5.2	6.7	7.3	11.7	15.1	21.8	26.4	48.1	53.6	55.0	47.7	214.9%
United States	1 105.8	1 226.2	1 433.5	1 662.0	1 837.2	1 938.6	2 172.0	2 179.2	1 982.2	1 465.2	1 356.1	-26.2%
OECD Americas	1 180.0	1 295.5	1 527.8	1 779.5	1 958.3	2 070.0	2 335.9	2 348.9	2 145.9	1 622.2	1 504.5	-23.2%
Australia	75.2	92.9	106.6	119.4	140.8	156.4	190.1	208.1	202.0	172.9	177.7	26.2%
Israel ²	0.0	0.0	0.0	7.3	9.5	16.5	25.6	29.5	29.3	25.6	21.9	131.0%
Japan	201.6	205.5	198.4	255.2	297.9	325.3	353.2	410.1	413.2	446.6	441.0	48.0%
Korea	22.2	32.1	50.5	84.0	90.8	106.5	180.5	200.1	284.3	311.4	303.3	234.1%
New Zealand	4.0	4.2	3.9	4.0	3.4	3.4	4.5	9.0	5.6	5.6	4.7	38.3%
OECD Asia Oceania	303.0	334.7	359.5	469.8	542.4	608.1	753.9	856.7	934.4	962.0	948.6	74.9%
Austria	16.3	13.9	14.2	17.4	16.5	14.3	15.0	16.2	14.4	12.8	11.7	-29.1%
Belgium	44.2	38.6	41.9	39.2	40.4	34.7	30.3	20.6	14.0	11.7	11.0	-72.9%
Czech Republic	132.0	124.2	132.1	138.9	116.6	91.4	86.2	78.0	74.2	63.1	63.5	-45.5%
Denmark	6.1	8.1	24.2	29.0	24.2	25.8	15.7	14.7	15.5	7.3	8.4	-65.4%
Estonia	..	..	..	..	23.6	11.3	10.4	12.0	14.2	10.8	11.8	-49.8%
Finland	8.7	9.6	20.1	20.3	21.7	23.8	21.6	20.8	28.8	16.3	18.0	-16.8%
France	140.1	108.3	125.6	94.5	75.9	59.3	59.6	55.9	45.6	31.6	27.6	-63.6%
Germany	558.0	499.5	561.2	591.5	516.2	380.3	345.9	334.5	314.3	316.0	301.0	-41.7%
Greece	6.7	10.8	13.2	24.8	33.5	37.1	38.3	38.5	33.6	23.6	20.1	-40.1%
Hungary	35.9	33.8	37.3	35.6	24.6	17.5	15.6	12.5	10.7	9.3	8.7	-64.7%
Iceland	0.0	-	0.1	0.3	0.3	0.2	0.4	0.4	0.4	0.4	0.4	53.3%
Ireland	8.9	7.3	8.1	10.7	14.7	12.5	10.6	11.0	8.2	9.0	8.7	-40.9%
Italy	32.6	31.3	44.4	59.8	56.6	45.5	43.9	63.8	52.4	48.0	42.7	-24.5%
Latvia	..	..	..	..	2.8	1.1	0.5	0.3	0.4	0.2	0.2	-94.1%
Luxembourg	12.3	8.1	8.4	6.7	5.2	2.1	0.4	0.3	0.3	0.2	0.2	-96.0%
Netherlands	15.2	12.4	14.4	24.0	29.9	33.7	29.7	31.1	29.1	43.2	40.0	33.8%
Norway	3.8	4.0	4.0	4.5	3.5	3.9	4.0	2.9	2.6	2.9	3.0	-14.1%
Poland	254.5	292.7	356.9	365.9	291.1	273.5	221.4	215.5	214.6	193.5	194.0	-33.4%
Portugal	2.5	1.7	1.7	2.9	10.8	14.2	15.0	13.4	6.5	12.9	11.3	4.3%
Slovak Republic	24.2	24.2	32.8	34.2	31.4	21.6	16.4	16.0	14.5	12.1	11.9	-62.0%
Slovenia	..	..	..	..	6.6	5.8	5.6	6.3	6.0	4.4	4.8	-28.5%
Spain	38.2	38.8	49.0	70.7	75.2	72.9	83.4	81.9	32.4	53.2	40.4	-46.3%
Sweden	5.5	7.0	5.5	10.7	10.5	9.6	8.3	10.1	9.2	6.9	6.6	-37.4%
Switzerland	1.9	1.0	1.4	2.0	1.4	0.8	0.6	0.6	0.6	0.5	0.5	-66.6%
Turkey	16.4	21.2	27.6	46.4	61.2	64.6	91.6	88.6	125.6	135.5	151.7	147.8%
United Kingdom	352.9	280.1	271.9	242.4	247.1	179.5	142.6	150.1	115.7	90.0	45.7	-81.5%
OECD Europe	1 717.1	1 576.6	1 796.0	1 872.5	1 741.6	1 437.0	1 313.2	1 296.1	1 183.7	1 115.5	1 043.8	-40.1%
<i>IEA/Accession/Association</i>	4 000.2	4 198.5	4 992.7	5 813.1	6 460.7	7 159.4	7 642.9	9 984.3	12 182.6	12 970.3	12 659.7	96.0%
<i>European Union - 28</i>	..	..	..	..	1 771.2	1 441.0	1 274.5	1 272.2	1 116.4	1 031.9	937.8	-47.1%
<i>G20</i>	..	..	..	..	7 447.8	7 888.0	8 313.3	10 689.2	12 873.1	13 559.9	13 241.0	77.8%
<i>Africa</i>	143.7	183.4	190.1	205.2	228.4	238.6	261.8	346.4	369.9	373.4	376.6	64.9%
<i>Americas</i>	1 197.3	1 314.7	1 556.8	1 822.8	2 005.2	2 123.8	2 404.3	2 419.1	2 227.2	1 726.2	1 602.0	-20.1%
<i>Asia</i>	1 118.1	1 338.9	1 701.6	2 248.4	3 057.8	3 848.8	4 187.0	6 617.0	9 254.0	10 710.1	10 658.9	248.6%
<i>Europe</i>	1 768.5	1 632.4	1 860.5	1 933.3	2 861.6	2 148.2	1 902.7	1 869.3	1 723.1	1 546.1	1 443.4	-49.6%
<i>Oceania</i>	80.2	97.4	110.9	123.8	144.7	160.3	195.3	217.7	209.0	180.5	184.5	27.5%

1. Total world includes non-OECD total, OECD total as well as international marine bunkers and international aviation bunkers.

2. Please refer to the chapter Geographical coverage.

CO₂ emissions from fuel combustion - coalmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Non-OECD Total	2 028.8	2 440.9	2 917.9	3 272.2	4 055.4	4 404.6	4 548.0	6 967.8	9 519.2	10 836.6	10 768.5	165.5%
Albania	1.2	1.6	2.5	3.7	2.4	0.1	0.1	0.1	0.5	0.4	0.2	-91.5%
Armenia	..	..	..	..	1.0	0.0	-	-	0.0	-	0.0	-99.5%
Azerbaijan	..	..	..	..	0.4	0.0	-	-	-	-	-	-100.0%
Belarus	..	..	..	..	9.6	5.5	3.8	2.4	2.2	3.0	3.2	-66.6%
Bosnia and Herzegovina	..	..	..	..	17.7	1.5	10.1	12.0	15.6	14.4	16.6	-6.0%
Bulgaria	34.0	35.9	38.8	43.3	37.7	30.2	26.1	28.6	28.6	27.0	23.4	-37.9%
Croatia	..	..	..	..	3.4	0.7	1.7	2.7	2.7	2.4	2.6	-23.6%
Cyprus ¹	-	-	-	0.2	0.3	0.1	0.1	0.1	0.1	0.0	-	-100.0%
FYR of Macedonia	..	..	..	..	5.6	6.0	5.7	6.2	5.5	4.1	3.7	-34.8%
Georgia	..	..	..	..	3.5	0.1	0.0	0.0	0.1	1.2	1.1	-68.5%
Gibraltar	..	..	..	..	-	-	-	-	-	-	-	-
Kazakhstan	..	..	..	..	158.7	114.3	74.7	102.7	137.6	121.2	121.3	-23.6%
Kosovo	..	..	..	..	..	..	4.1	5.2	7.1	6.6	7.1	..
Kyrgyzstan	..	..	..	..	10.2	1.3	1.9	2.2	2.8	4.5	3.6	-64.4%
Lithuania	..	..	..	..	3.2	1.0	0.4	0.8	0.8	0.7	0.7	-76.7%
Malta	..	..	..	0.5	0.7	0.1	-	-	-	-	-	-100.0%
Republic of Moldova	..	..	..	..	7.9	2.3	0.5	0.4	0.4	0.4	0.3	-96.3%
Montenegro	..	..	..	..	..	..	..	1.2	1.8	1.6	1.3	..
Romania	32.5	39.5	50.8	59.7	50.8	41.3	29.5	36.3	29.7	25.6	22.9	-54.9%
Russian Federation	..	..	..	..	707.2	483.7	443.1	413.6	405.0	342.9	324.3	-54.1%
Serbia	..	..	..	..	42.1	36.9	35.7	34.0	32.3	32.3	32.9	-21.8%
Tajikistan	..	..	..	..	2.5	0.1	0.0	0.2	0.4	1.8	2.4	-5.3%
Turkmenistan	..	..	..	..	1.2	-	-	-	-	-	-	-100.0%
Ukraine	..	..	..	..	292.9	166.4	120.5	118.3	132.9	104.6	112.2	-61.7%
Uzbekistan	..	..	..	..	14.0	4.4	5.2	4.7	5.5	6.5	6.4	-53.9%
Former Soviet Union	884.5	1 039.4	1 137.7	986.5	..	..	..	..	..	..	..	..
Former Yugoslavia	36.7	41.5	43.6	74.0	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia	989.0	1 157.9	1 273.4	1 167.9	1 372.9	896.0	763.1	771.8	811.5	701.3	686.2	-50.0%
Algeria	0.4	0.3	0.2	1.0	1.3	1.4	0.7	1.1	0.8	0.3	-	-100.0%
Angola	-	-	-	-	-	-	-	-	-	-	-	-
Benin	-	-	-	-	-	-	-	-	-	0.1	0.3	x
Botswana	..	..	..	1.0	1.8	2.0	2.3	2.3	0.7	3.9	3.8	107.9%
Cameroon	-	-	-	-	-	-	-	-	-	-	-	-
Congo	-	-	-	-	-	-	-	-	-	-	-	-
Côte d'Ivoire	-	-	-	-	-	-	-	-	-	-	-	-
Dem. Rep. of the Congo	1.0	0.8	0.9	0.8	0.9	-	-	-	-	-	-	-100.0%
Egypt	1.4	2.3	2.2	2.9	2.9	3.2	3.2	3.4	1.8	1.5	1.5	-48.4%
Eritrea	..	..	..	..	..	..	..	..	..	..	..	..
Ethiopia	-	-	-	-	-	-	-	-	0.1	1.0	1.1	x
Gabon	-	-	-	-	-	-	-	-	-	-	-	-
Ghana	-	-	-	-	-	-	-	-	-	-	-	-
Kenya	0.2	0.1	0.0	0.2	0.4	0.4	0.3	0.4	0.7	1.4	1.4	268.9%
Libya	-	-	-	-	-	-	-	-	-	-	-	-
Mauritius	-	-	-	0.1	0.1	0.2	0.6	0.9	1.6	1.8	1.8	+
Morocco	1.2	1.7	1.6	2.7	4.2	6.9	10.5	12.4	11.1	17.6	17.0	302.3%
Mozambique	1.5	1.2	0.7	0.3	0.1	0.1	-	-	0.0	0.0	0.0	-70.7%
Namibia	..	..	..	..	..	0.0	0.0	0.0	0.0	0.0	0.1	..
Niger	..	..	..	..	..	..	0.2	0.2	0.3	0.3	0.3	..
Nigeria	0.5	0.6	0.5	0.3	0.2	0.0	0.0	0.0	0.1	0.1	0.1	-39.8%
Senegal	-	-	-	-	-	-	-	0.4	0.7	1.5	1.8	x
South Africa	129.3	168.6	174.5	186.0	200.7	211.5	231.4	314.9	342.3	332.9	337.0	67.9%
South Sudan	..	..	..	..	..	..	..	..	..	..	..	..
Sudan	-	-	0.0	-	-	-	-	-	-	-	-	-
United Rep. of Tanzania	-	-	0.0	0.0	0.0	0.1	0.2	0.1	-	0.6	0.7	+
Togo	-	-	-	-	-	-	-	-	-	-	-	-
Tunisia	0.3	0.4	0.3	0.3	0.3	0.3	0.3	-	-	-	-	-100.0%
Zambia	2.0	1.9	1.4	1.1	0.9	0.3	0.3	0.3	0.0	0.4	0.8	-12.5%
Zimbabwe	5.8	5.2	6.2	7.7	13.7	11.5	10.3	8.2	7.4	8.1	7.1	-48.1%
Other Africa	0.1	0.2	1.6	0.6	0.9	0.5	1.5	1.7	2.3	2.0	2.0	133.6%
Africa	143.7	183.4	190.1	205.2	228.4	238.6	261.8	346.4	369.9	373.4	376.6	64.9%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions from fuel combustion - coalmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Bangladesh	0.4	0.5	0.5	0.2	1.1	1.3	1.3	1.9	3.2	9.0	6.7	504.4%
Brunei Darussalam	-	-	-	-	-	-	-	-	-	-	-	-
Cambodia	..	..	..	..	..	..	..	..	0.1	2.4	2.7	..
DPR of Korea	66.6	74.3	100.0	122.0	108.9	72.6	66.8	72.5	46.7	19.5	22.2	-79.6%
India	127.2	157.0	181.6	261.5	364.8	477.0	571.5	709.8	1 088.2	1 455.1	1 468.1	302.5%
Indonesia	0.5	0.5	0.6	5.1	18.5	26.6	52.5	87.6	107.9	165.0	174.1	841.2%
Malaysia	0.0	0.0	0.2	1.4	5.3	6.6	9.8	27.3	58.5	68.9	74.8	+
Mongolia	..	..	..	9.6	10.4	9.2	7.7	9.3	11.6	13.6	15.0	44.0%
Myanmar	0.6	0.6	0.6	0.6	0.3	0.1	1.3	1.3	1.6	1.8	1.5	469.1%
Nepal	0.0	0.1	0.2	0.0	0.2	0.3	1.0	1.0	1.2	2.2	2.7	+
Pakistan	2.6	2.2	2.7	5.0	7.3	8.0	6.9	14.6	16.4	20.0	20.8	183.6%
Philippines	0.1	0.2	1.5	5.6	5.1	6.9	19.9	22.7	29.8	49.4	55.9	+
Singapore	0.0	0.0	0.0	0.1	0.1	0.1	-	0.0	0.0	1.6	1.7	+
Sri Lanka	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	5.5	5.8	+
Chinese Taipei	10.2	8.6	14.9	26.6	42.7	64.4	111.3	147.7	155.1	149.7	155.0	263.1%
Thailand	0.5	0.6	1.9	6.7	16.4	29.9	32.0	47.8	65.4	68.2	62.2	280.1%
Viet Nam	5.7	10.2	9.4	11.5	9.1	13.7	18.0	34.0	60.2	102.4	113.2	+
Other non-OECD Asia	4.5	4.9	7.8	1.0	0.8	0.6	1.4	1.7	4.4	12.5	26.7	+
Asia (excl. China)	218.9	259.8	321.9	456.8	591.0	717.1	901.5	1 179.3	1 650.7	2 146.7	2 209.3	273.8%
People's Rep. of China	659.4	818.3	1 101.4	1 384.7	1 790.8	2 472.9	2 532.6	4 567.8	6 574.3	7 470.8	7 357.9	310.9%
Hong Kong, China	0.1	0.0	0.0	12.6	24.1	23.7	16.8	26.4	25.2	27.3	27.2	12.9%
China	659.5	818.4	1 101.4	1 397.3	1 814.9	2 496.6	2 549.4	4 594.2	6 599.5	7 498.1	7 385.2	306.9%
Argentina	3.4	3.5	3.2	3.6	3.6	4.9	4.8	5.9	6.1	5.3	4.3	19.1%
Bolivia	-	-	-	0.3	-	-	-	-	-	-	-	-
Brazil	6.0	6.9	15.1	26.4	27.7	32.8	46.5	45.6	54.1	68.0	61.4	121.7%
Colombia	6.1	6.7	8.8	10.2	12.2	13.9	12.1	10.5	10.8	16.3	17.0	38.7%
Costa Rica	0.0	0.0	0.0	0.0	-	-	0.0	0.1	0.3	0.3	0.4	x
Cuba	0.4	0.3	0.4	0.5	0.6	0.3	0.1	0.1	0.1	0.0	0.0	-98.6%
Curaçao ¹	-	-	-	-	-	-	-	-	-	-	-	-
Dominican Republic	-	-	-	0.5	0.0	0.2	0.3	2.2	3.2	4.3	4.1	+
Ecuador	-	-	-	-	-	-	-	-	-	-	-	-
El Salvador	-	-	0.0	-	-	0.0	0.0	0.0	-	-	-	-
Guatemala	-	-	0.1	-	-	-	0.5	1.0	1.2	3.7	4.4	x
Haiti	-	-	-	0.1	0.0	-	-	-	-	-	-	-100.0%
Honduras	-	-	-	-	0.0	0.0	0.3	0.6	0.6	0.3	0.4	+
Jamaica	-	-	-	-	0.1	0.1	0.1	0.1	0.1	0.2	0.2	40.4%
Nicaragua	-	-	-	-	-	-	-	-	-	-	-	-
Panama	0.0	0.0	-	0.1	0.1	0.1	0.1	-	-	0.8	0.7	837.5%
Paraguay	-	-	-	-	-	-	-	-	-	-	-	-
Peru	0.6	0.6	0.7	0.7	0.6	1.4	2.5	3.6	3.6	3.5	3.7	507.4%
Suriname	..	..	..	..	..	..	..	..	..	..	..	..
Trinidad and Tobago	-	-	-	-	-	-	-	-	-	-	-	-
Uruguay	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-100.0%
Venezuela	0.6	1.1	0.7	0.8	1.9	0.0	0.5	0.1	0.8	0.5	0.5	-74.2%
Other non-OECD Americas	0.1	0.1	0.1	0.0	0.0	0.0	0.3	0.4	0.4	0.5	0.5	+
Non-OECD Americas	17.3	19.2	29.1	43.3	46.9	53.9	68.3	70.2	81.3	104.0	97.5	107.8%
Bahrain	-	-	-	-	-	-	-	-	-	-	-	-
Islamic Republic of Iran	0.4	2.1	2.0	1.7	1.2	1.9	3.4	4.7	2.7	4.6	4.6	275.1%
Iraq	-	-	-	-	-	-	-	-	-	-	-	-
Jordan	-	-	-	-	-	-	-	-	-	0.7	0.9	x
Kuwait	-	-	-	-	-	-	-	-	-	-	-	-
Lebanon	0.0	0.0	0.0	-	-	0.5	0.5	0.5	0.6	0.7	0.7	x
Oman	-	-	-	-	-	-	-	-	-	-	-	-
Qatar	-	-	-	-	-	-	-	-	-	-	-	-
Saudi Arabia	-	-	-	-	-	-	-	-	-	-	-	-
Syrian Arab Republic	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	x
United Arab Emirates	-	-	-	-	-	-	-	0.6	2.6	6.8	7.3	x
Yemen	-	-	-	-	-	-	-	-	0.4	0.3	0.3	x
Middle East	0.5	2.2	2.0	1.7	1.2	2.3	3.9	5.8	6.3	13.1	13.7	+

1. Please refer to the chapter Geographical coverage.

CO₂ emissions from fuel combustion - oil

 million tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
World ¹	6 670.9	7 583.9	8 391.2	7 775.2	8 497.4	8 793.6	9 621.2	10 287.5	10 525.0	11 111.0	11 231.8	32.2%
<i>Annex I Parties</i>	..	..	..	..	5 456.2	5 101.8	5 341.7	5 378.1	4 835.8	4 645.5	4 647.3	-14.8%
<i>Annex II Parties</i>	4 432.6	4 672.9	4 728.6	4 072.9	4 298.7	4 413.8	4 729.1	4 773.3	4 230.7	4 002.4	4 002.8	-6.9%
<i>North America</i>	2 195.4	2 298.2	2 320.5	2 087.4	2 155.5	2 164.7	2 510.6	2 578.0	2 323.4	2 246.7	2 258.5	4.8%
<i>Europe</i>	1 622.9	1 660.0	1 693.0	1 370.1	1 421.3	1 495.7	1 498.0	1 497.8	1 308.0	1 178.5	1 180.3	-17.0%
<i>Asia Oceania</i>	614.3	714.6	715.2	615.4	721.8	753.4	720.5	697.5	599.3	577.2	564.1	-21.9%
<i>Annex I EIT</i>	..	..	..	..	1 091.0	603.4	523.5	520.4	526.5	543.9	537.5	-50.7%
<i>Non-Annex I Parties</i>	..	..	..	..	2 410.5	2 973.3	3 425.5	3 915.2	4 568.9	5 271.6	5 344.6	121.7%
<i>Annex B Kyoto Parties</i>	..	..	..	..	2 038.0	1 888.5	1 833.6	1 868.3	1 696.3	1 573.3	1 595.1	-21.7%
Intl. aviation bunkers	169.2	173.9	202.1	224.9	258.9	290.3	355.6	422.7	457.6	531.8	557.7	115.4%
Intl. marine bunkers	353.8	341.1	357.1	306.3	371.7	428.2	498.4	571.5	662.7	662.1	682.2	83.5%
Non-OECD Total	1 490.6	2 078.1	2 674.8	2 736.7	3 024.8	2 991.1	3 338.9	3 828.7	4 495.6	5 231.7	5 271.9	74.3%
OECD Total	4 657.3	4 990.8	5 157.1	4 507.3	4 841.9	5 083.9	5 428.3	5 464.6	4 909.1	4 685.5	4 720.0	-2.5%
Canada	208.1	230.3	243.6	184.4	204.0	204.3	227.2	261.4	263.7	263.1	266.1	30.4%
Chile	14.6	12.4	15.1	13.1	18.7	27.2	30.3	33.6	42.3	45.1	47.3	152.7%
Mexico	69.0	103.4	156.8	178.9	193.4	213.2	251.3	255.1	251.7	243.1	251.5	30.0%
United States	1 987.3	2 067.9	2 076.9	1 903.0	1 951.5	1 960.4	2 283.4	2 316.6	2 059.7	1 983.6	1 992.4	2.1%
OECD Americas	2 279.0	2 414.1	2 492.4	2 279.4	2 367.6	2 405.1	2 792.2	2 866.8	2 617.4	2 534.8	2 557.2	8.0%
Australia	64.1	78.0	83.8	77.0	85.5	90.4	99.9	109.1	119.9	131.1	132.8	55.4%
Israel ²	13.7	16.4	18.8	17.0	23.4	28.4	29.3	26.1	28.9	22.0	22.5	-3.5%
Japan	540.9	625.1	620.7	528.8	624.6	648.9	604.9	570.5	462.1	427.5	412.4	-34.0%
Korea	30.7	45.6	75.1	71.8	133.0	226.6	205.4	185.3	163.0	162.4	169.0	27.1%
New Zealand	9.3	11.5	10.7	9.6	11.8	14.1	15.8	17.8	17.3	18.5	18.8	59.7%
OECD Asia Oceania	658.7	776.7	809.1	704.1	878.1	1 008.4	955.2	909.0	791.2	761.6	755.6	-14.0%
Austria	26.9	28.5	31.9	25.4	27.2	29.5	30.7	37.6	32.5	30.4	30.8	13.1%
Belgium	62.4	59.5	64.1	44.9	46.1	51.3	51.7	52.5	49.3	47.2	45.9	-0.4%
Czech Republic	19.6	27.6	30.2	27.2	22.0	17.0	17.4	21.5	19.9	20.3	20.2	-8.3%
Denmark	49.3	44.3	38.6	30.3	22.0	24.3	23.4	21.8	19.8	16.4	16.6	-24.4%
Estonia	..	..	..	..	9.0	3.5	2.7	3.1	3.0	3.1	3.3	-63.7%
Finland	31.2	33.1	33.0	26.1	27.0	25.3	24.7	25.2	24.2	20.5	22.3	-17.7%
France	265.5	284.1	285.5	206.2	214.1	218.8	223.6	220.4	195.2	175.3	172.4	-19.5%
Germany	381.7	386.7	372.1	309.0	303.7	323.9	301.9	276.6	249.4	242.5	243.3	-19.9%
Greece	18.4	23.3	32.0	29.6	36.2	39.1	45.6	51.3	42.9	35.0	34.9	-3.7%
Hungary	18.4	26.7	29.0	26.1	21.9	18.8	16.4	15.2	14.7	16.1	16.5	-24.7%
Iceland	1.4	1.6	1.7	1.4	1.6	1.7	1.7	1.8	1.6	1.7	1.7	1.6%
Ireland	12.7	13.9	16.1	11.2	12.1	15.8	23.2	25.4	20.5	17.6	18.3	51.1%
Italy	232.7	244.7	264.6	225.2	244.8	253.1	242.5	227.3	177.6	148.7	143.5	-41.4%
Latvia	..	..	..	..	10.4	5.5	3.8	4.0	4.1	3.9	3.9	-62.5%
Luxembourg	4.1	3.8	3.0	2.9	4.5	4.8	5.9	8.2	7.4	6.6	6.4	44.2%
Netherlands	65.2	50.4	64.0	42.1	48.0	51.8	52.6	54.9	51.1	47.6	48.4	0.8%
Norway	19.2	19.2	21.2	19.0	19.1	19.2	20.2	22.0	21.5	19.4	18.9	-0.9%
Poland	21.4	32.8	41.6	37.8	33.5	39.4	49.7	56.6	65.3	60.2	67.3	101.1%
Portugal	11.9	16.4	22.1	21.0	27.1	33.1	38.0	38.7	29.8	24.3	25.5	-6.0%
Slovak Republic	12.0	14.4	17.9	13.8	11.6	6.6	5.4	8.4	9.1	8.7	9.4	-19.5%
Slovenia	..	..	..	..	5.1	6.8	6.8	7.2	7.5	6.6	6.9	36.3%
Spain	80.2	115.2	134.1	97.8	117.1	137.3	160.2	184.3	157.3	136.5	139.8	19.4%
Sweden	76.5	72.0	67.3	46.9	39.5	44.8	40.7	35.4	31.9	26.0	26.7	-32.4%
Switzerland	37.0	34.8	36.0	35.9	33.2	32.9	32.6	33.5	32.1	26.5	26.6	-19.8%
Turkey	25.3	38.4	43.9	48.8	61.3	77.3	80.7	74.9	68.9	91.8	99.5	62.4%
United Kingdom	246.5	228.4	205.8	195.4	197.9	189.0	178.8	181.0	163.8	156.3	158.2	-20.0%
OECD Europe	1 719.6	1 800.0	1 855.6	1 523.7	1 596.2	1 670.4	1 681.0	1 688.9	1 500.5	1 389.1	1 407.2	-11.8%
<i>IEA/Accession/Association</i>	5 010.0	5 523.9	5 876.8	5 257.8	5 763.4	6 317.1	6 970.7	7 305.5	7 118.5	7 342.2	7 430.7	28.9%
<i>European Union - 28</i>	..	..	..	..	1 594.2	1 611.3	1 608.0	1 624.9	1 436.4	1 308.8	1 321.3	-17.1%
<i>G20</i>	..	..	..	..	6 349.7	6 550.1	7 172.0	7 504.8	7 419.6	7 783.8	7 827.9	23.3%
<i>Africa</i>	100.1	131.6	182.1	216.2	241.9	263.3	298.4	361.7	446.0	543.1	551.9	128.1%
<i>Americas</i>	2 563.5	2 758.6	2 908.8	2 641.0	2 771.5	2 879.3	3 340.5	3 445.8	3 298.0	3 273.3	3 270.1	18.0%
<i>Asia</i>	991.7	1 279.2	1 580.5	1 611.3	2 197.3	2 707.4	2 967.0	3 303.0	3 653.0	4 189.9	4 260.5	93.9%
<i>Europe</i>	1 756.4	1 837.7	1 905.6	1 546.4	2 553.9	2 115.1	2 039.3	2 046.3	1 862.3	1 748.8	1 745.1	-31.7%
<i>Oceania</i>	76.7	94.4	99.3	91.7	102.1	109.9	122.0	136.4	145.4	162.0	164.2	60.8%

1. Total world includes non-OECD total, OECD total as well as international marine bunkers and international aviation bunkers.

2. Please refer to the chapter Geographical coverage.

CO₂ emissions from fuel combustion - oilmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Non-OECD Total	1 490.6	2 078.1	2 674.8	2 736.7	3 024.8	2 991.1	3 338.9	3 828.7	4 495.6	5 231.7	5 271.9	74.3%
Albania	2.4	2.2	3.5	2.4	2.8	1.7	3.0	3.8	3.4	3.4	3.4	22.7%
Armenia	..	..	..	..	10.5	0.7	0.8	1.0	1.0	0.8	0.8	-92.0%
Azerbaijan	..	..	..	..	20.9	16.8	16.9	11.9	7.4	10.5	10.9	-47.7%
Belarus	..	..	..	..	65.6	27.7	17.3	15.7	17.7	15.7	16.0	-75.6%
Bosnia and Herzegovina	..	..	..	..	5.4	1.5	3.2	3.2	4.5	4.4	4.9	-8.2%
Bulgaria	29.2	35.1	38.8	28.0	25.8	13.3	10.1	11.8	10.9	11.5	11.8	-54.1%
Croatia	..	..	..	..	12.8	10.6	11.0	12.6	10.4	9.3	9.3	-27.4%
Cyprus ¹	1.7	1.7	2.6	2.6	3.6	5.0	6.2	6.9	7.2	5.8	6.2	70.5%
FYR of Macedonia	..	..	..	..	3.0	2.3	2.7	2.6	2.6	2.8	2.8	-4.8%
Georgia	..	..	..	..	19.3	5.9	2.4	2.1	2.8	3.3	4.0	-79.4%
Gibraltar	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.4	0.5	0.6	0.6	352.3%
Kazakhstan	..	..	..	..	53.6	32.6	22.0	25.6	29.7	41.9	46.7	-12.9%
Kosovo	..	..	..	..	..	..	1.0	1.4	1.6	2.0	1.9	..
Kyrgyzstan	..	..	..	..	9.0	1.4	1.2	1.4	2.7	4.8	5.1	-43.1%
Lithuania	..	..	..	..	19.7	8.9	6.4	7.1	6.8	7.1	7.4	-62.2%
Malta	0.7	0.7	1.0	0.7	1.6	2.3	2.1	2.6	2.6	1.6	1.4	-14.4%
Republic of Moldova	..	..	..	..	15.0	3.1	1.3	1.9	2.2	2.3	2.5	-83.4%
Montenegro	..	..	..	..	..	..	..	0.8	0.8	0.8	0.8	..
Romania	29.8	38.2	50.5	40.2	49.8	32.0	26.6	27.1	22.3	23.6	24.7	-50.5%
Russian Federation	..	..	..	..	618.7	340.9	318.1	294.0	297.5	329.5	309.7	-49.9%
Serbia	..	..	..	..	13.7	4.8	4.1	11.5	9.6	8.6	9.0	-34.8%
Tajikistan	..	..	..	..	5.2	1.2	0.7	0.9	1.6	2.4	2.4	-54.7%
Turkmenistan	..	..	..	..	14.7	6.9	11.1	14.6	16.2	19.0	18.8	28.2%
Ukraine	..	..	..	..	185.2	72.5	31.9	35.8	37.4	28.3	31.2	-83.2%
Uzbekistan	..	..	..	..	25.0	18.5	17.8	13.3	10.2	6.9	6.4	-74.4%
Former Soviet Union	635.7	937.4	1 120.1	1 102.9	..	..	..	..	..	..	..	..
Former Yugoslavia	23.8	29.9	35.6	34.5	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia	723.4	1 045.1	1 252.2	1 211.5	1 180.8	611.0	518.0	510.0	509.5	546.8	538.7	-54.4%
Algeria	5.8	8.6	14.1	19.2	23.7	22.7	24.9	31.4	43.5	57.6	55.5	134.2%
Angola	1.5	1.8	2.5	2.6	2.9	2.8	3.5	4.9	13.7	18.3	18.0	524.3%
Benin	0.3	0.5	0.4	0.5	0.3	0.2	1.4	2.7	4.6	5.2	5.4	+
Botswana	..	..	..	0.5	1.0	1.2	1.7	2.0	2.6	3.2	3.2	221.1%
Cameroon	0.7	1.0	1.7	2.4	2.6	2.5	2.8	2.9	4.6	5.0	5.1	92.1%
Congo	0.6	0.6	0.7	0.8	0.6	0.5	0.5	0.8	1.6	2.2	2.2	241.8%
Côte d'Ivoire	2.4	3.0	3.4	3.0	2.7	3.2	3.4	2.9	3.1	5.7	5.9	117.3%
Dem. Rep. of the Congo	1.6	1.8	2.3	2.4	2.1	1.1	0.9	1.3	1.8	2.7	2.0	-5.1%
Egypt	18.5	23.2	35.8	55.0	61.6	57.7	66.8	78.5	100.8	120.0	121.8	97.7%
Eritrea	..	..	..	..	..	0.8	0.6	0.6	0.5	0.6	0.6	..
Ethiopia	1.3	1.2	1.4	1.4	2.2	2.3	3.2	4.5	5.9	9.2	9.9	353.7%
Gabon	0.5	0.8	1.3	1.6	0.7	1.1	1.2	1.4	2.0	2.5	2.5	262.5%
Ghana	1.9	2.3	2.2	2.1	2.5	3.2	5.0	6.4	9.6	11.6	11.7	360.1%
Kenya	3.0	3.3	4.4	4.4	5.1	5.3	7.5	7.1	10.6	12.8	14.3	178.4%
Libya	1.6	6.2	12.3	15.0	17.7	26.0	29.9	34.6	37.9	30.8	30.8	73.4%
Mauritius	0.3	0.4	0.6	0.5	1.0	1.4	1.8	2.1	2.0	2.2	2.2	118.4%
Morocco	5.3	7.8	12.0	13.4	15.3	19.2	19.0	25.6	33.6	35.0	35.5	131.4%
Mozambique	1.5	1.2	1.7	1.3	0.9	1.0	1.3	1.5	2.2	3.5	5.6	495.1%
Namibia	..	..	..	..	..	1.8	1.9	2.4	3.0	3.8	4.0	..
Niger	..	..	..	..	..	..	0.5	0.5	1.1	1.7	1.7	..
Nigeria	4.8	9.1	22.0	24.6	21.0	23.5	29.1	37.9	35.5	53.2	55.6	165.4%
Senegal	1.2	1.6	2.0	2.1	2.1	2.4	3.5	4.2	4.7	6.0	6.3	197.5%
South Africa	27.8	34.4	33.9	36.9	43.1	48.3	49.1	57.4	62.6	73.1	73.4	70.1%
South Sudan	..	..	..	..	..	..	..	..	..	2.0	1.8	..
Sudan	3.2	3.2	3.7	4.0	5.3	4.3	5.5	9.9	15.0	15.6	18.9	256.4%
United Rep. of Tanzania	1.4	1.4	1.5	1.4	1.7	2.4	2.4	4.2	4.6	9.3	8.3	398.9%
Togo	0.3	0.3	0.4	0.3	0.6	0.6	0.9	1.0	2.1	1.9	2.0	239.7%
Tunisia	3.4	4.0	6.8	7.2	9.0	9.1	10.9	11.7	11.4	13.8	12.9	43.2%
Zambia	1.4	2.4	1.8	1.6	1.7	1.7	1.4	1.8	1.6	2.9	2.9	70.8%
Zimbabwe	1.5	2.0	1.7	2.0	2.6	3.6	3.0	2.1	1.9	3.7	3.2	26.0%
Other Africa	8.3	9.4	11.7	10.2	11.8	13.6	14.9	17.6	21.8	28.3	28.8	144.9%
Africa	100.1	131.6	182.1	216.2	241.9	263.3	298.4	361.7	446.0	543.1	551.9	128.1%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions from fuel combustion - oilmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Bangladesh	2.2	3.3	4.6	4.4	4.9	7.1	7.9	11.0	10.9	16.1	15.7	219.0%
Brunei Darussalam	0.2	0.2	0.5	0.6	0.7	1.1	1.2	1.3	1.7	1.9	1.8	146.1%
Cambodia	..	..	..	..	..	1.5	2.0	2.6	4.6	5.7	6.6	..
DPR of Korea	2.6	4.3	8.1	7.5	8.0	4.0	3.2	2.9	2.6	3.0	3.2	-59.6%
India	52.8	58.9	80.0	110.0	151.1	201.3	277.0	307.8	396.1	516.0	544.3	260.1%
Indonesia	24.6	36.8	61.6	70.4	91.4	130.3	157.5	180.1	182.9	211.8	205.3	124.6%
Malaysia	12.8	16.1	23.3	26.9	37.6	48.9	56.7	64.6	68.2	80.9	78.4	108.7%
Mongolia	..	..	..	2.2	2.4	1.1	1.3	1.7	2.5	3.5	3.0	22.3%
Myanmar	3.8	3.0	3.9	3.5	2.1	4.0	5.4	6.2	3.3	10.3	11.4	451.1%
Nepal	0.2	0.2	0.3	0.5	0.7	1.5	2.1	2.1	2.9	3.5	5.8	691.7%
Pakistan	8.4	10.5	12.7	20.7	30.8	45.6	56.6	47.7	60.7	76.6	81.0	163.4%
Philippines	23.7	29.1	31.1	23.7	33.0	50.3	48.2	42.1	40.1	47.8	51.1	54.9%
Singapore	6.0	8.4	12.5	16.4	28.6	34.0	38.9	23.8	26.5	21.3	21.8	-23.6%
Sri Lanka	2.8	2.6	3.6	3.5	3.7	5.4	10.5	13.1	12.1	14.0	15.1	313.7%
Chinese Taipei	18.0	30.0	53.2	41.1	65.4	82.2	89.3	83.6	68.7	61.9	62.0	-5.2%
Thailand	15.8	20.6	31.9	28.5	52.8	89.5	79.4	91.5	83.2	95.2	99.7	88.9%
Viet Nam	10.6	6.7	5.5	5.8	8.2	13.3	23.6	34.1	46.8	43.9	51.6	527.1%
Other non-OECD Asia	5.6	7.4	8.6	8.0	8.8	8.2	9.5	13.4	16.9	23.7	24.0	171.7%
Asia (excl. China)	190.0	238.0	341.5	373.6	530.2	729.3	870.2	929.7	1 030.8	1 237.0	1 281.9	141.8%
People's Rep. of China	113.4	193.6	234.3	225.1	278.2	400.5	531.3	768.2	1 011.1	1 261.8	1 298.0	366.5%
Hong Kong, China	9.1	10.8	14.4	9.3	8.4	11.6	16.5	8.4	8.8	9.7	10.4	24.0%
China	122.5	204.4	248.7	234.4	286.6	412.1	547.8	776.6	1 019.9	1 271.5	1 308.4	356.5%
Argentina	67.0	64.7	70.3	53.7	52.4	60.2	64.4	66.4	80.3	88.4	86.7	65.3%
Bolivia	2.0	2.9	3.7	3.3	3.7	4.6	4.7	5.7	8.0	10.5	11.5	211.6%
Brazil	80.9	121.7	151.1	126.1	151.0	187.5	229.6	227.9	266.6	306.8	289.5	91.8%
Colombia	18.0	18.4	20.2	22.0	26.0	32.1	29.2	28.7	30.9	42.2	44.5	71.1%
Costa Rica	1.3	1.7	2.2	1.9	2.6	4.4	4.5	5.3	6.3	6.6	7.1	173.1%
Cuba	20.3	23.7	30.0	31.5	33.4	22.0	26.1	23.5	27.4	24.5	21.0	-37.0%
Curaçao ¹	14.5	10.2	8.7	4.5	2.7	2.6	5.6	6.0	4.4	4.7	4.1	55.7%
Dominican Republic	3.5	5.2	6.3	5.7	7.4	11.0	17.3	14.8	14.2	15.0	16.2	119.6%
Ecuador	3.5	5.9	10.4	11.7	13.3	16.7	18.1	23.3	31.1	35.4	33.6	152.4%
El Salvador	1.3	1.9	1.6	1.6	2.1	4.6	5.2	6.2	5.8	6.5	6.8	220.8%
Guatemala	2.3	3.0	4.2	3.2	3.2	5.9	8.1	9.6	9.1	11.4	11.9	269.5%
Haiti	0.4	0.4	0.6	0.6	0.9	0.9	1.4	2.0	2.1	3.2	3.3	259.2%
Honduras	1.1	1.3	1.7	1.7	2.2	3.6	4.2	6.6	6.9	9.0	8.7	301.5%
Jamaica	5.5	7.4	6.5	4.7	7.1	8.3	9.7	10.1	6.8	6.8	7.1	-1.0%
Nicaragua	1.5	1.8	1.8	1.8	1.8	2.5	3.5	4.0	4.3	5.1	5.3	188.3%
Panama	2.5	3.1	2.9	2.6	2.5	4.0	4.7	6.8	8.8	9.9	9.4	279.2%
Paraguay	0.6	0.7	1.3	1.4	1.9	3.5	3.3	3.5	4.7	5.7	6.4	232.0%
Peru	14.2	16.8	18.7	16.0	17.5	21.3	22.8	21.1	24.6	27.3	28.8	64.5%
Suriname	..	..	..	..	..	..	1.5	1.7	1.7	2.1	1.9	..
Trinidad and Tobago	2.6	2.3	2.5	2.2	2.1	2.2	2.6	3.9	4.8	4.8	5.5	165.4%
Uruguay	5.0	5.3	5.3	3.0	3.6	4.4	5.0	5.0	5.8	6.3	6.2	73.2%
Venezuela	28.4	35.3	56.2	53.1	54.1	58.7	64.0	83.9	111.0	90.0	80.7	49.1%
Other non-OECD Americas	8.1	10.8	10.2	9.2	12.4	13.3	13.0	13.0	15.0	16.5	16.7	35.5%
Non-OECD Americas	284.5	344.6	416.3	361.5	403.8	474.2	548.3	579.0	680.6	738.5	712.9	76.5%
Bahrain	1.1	1.1	1.5	1.6	2.0	2.3	2.4	3.5	3.8	4.4	4.4	125.2%
Islamic Republic of Iran	33.0	57.8	77.9	126.5	136.2	166.4	190.8	223.4	221.6	206.1	193.3	41.9%
Iraq	8.5	12.4	23.8	36.3	48.6	89.1	64.5	69.7	94.1	117.6	125.8	158.7%
Jordan	1.4	2.2	4.3	7.5	8.9	11.7	13.7	14.7	13.4	18.5	15.0	67.8%
Kuwait	4.1	5.2	13.2	27.0	16.2	14.6	27.9	41.2	49.1	50.5	47.5	192.6%
Lebanon	4.6	5.7	6.6	6.6	5.5	12.3	13.5	13.9	17.1	22.1	22.5	308.5%
Oman	0.3	0.7	1.5	3.5	5.2	7.9	8.7	10.4	11.3	18.1	17.2	229.0%
Qatar	0.3	0.7	1.4	1.6	1.9	2.4	2.8	6.6	12.5	15.0	16.1	750.2%
Saudi Arabia	10.0	17.1	78.5	89.0	107.9	137.0	167.8	196.5	288.3	375.2	365.6	238.8%
Syrian Arab Republic	5.4	8.3	12.2	19.2	24.0	27.1	29.6	44.5	40.9	18.7	19.7	-17.9%
United Arab Emirates	0.4	1.7	9.5	15.7	18.6	20.9	21.0	28.3	36.6	39.2	43.1	131.6%
Yemen	1.2	1.8	3.5	4.9	6.3	9.4	13.3	18.8	20.1	9.4	7.9	25.6%
Middle East	70.1	114.5	234.1	339.4	381.4	501.1	556.1	671.5	808.7	894.6	878.0	130.2%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions from fuel combustion - natural gasmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
World ¹	2 044.2	2 250.1	2 709.9	3 071.0	3 679.5	3 983.7	4 551.1	5 205.9	6 026.4	6 436.0	6 605.1	79.5%
<i>Annex I Parties</i>	..	..	..	..	2 998.3	3 116.6	3 400.7	3 567.7	3 790.9	3 757.3	3 850.7	28.4%
<i>Annex II Parties</i>	1 443.6	1 500.7	1 652.7	1 600.9	1 759.2	2 089.1	2 385.2	2 458.2	2 660.6	2 710.6	2 795.6	58.9%
<i>North America</i>	1 264.1	1 149.5	1 182.0	1 057.8	1 114.0	1 287.5	1 396.7	1 347.2	1 459.3	1 653.8	1 666.8	49.6%
<i>Europe</i>	166.7	322.6	401.1	432.1	491.9	620.3	770.8	876.2	910.7	723.1	779.7	58.5%
<i>Asia Oceania</i>	12.8	28.6	69.6	111.0	153.3	181.3	217.7	234.8	290.6	333.6	349.1	127.7%
<i>Annex I EIT</i>	..	..	..	..	1 232.8	1 015.3	986.6	1 057.2	1 057.1	955.3	967.8	-21.5%
<i>Non-Annex I Parties</i>	..	..	..	..	681.1	867.2	1 150.4	1 638.2	2 235.4	2 678.6	2 754.2	304.4%
<i>Annex B Kyoto Parties</i>	..	..	..	..	944.3	987.0	1 121.1	1 262.2	1 285.4	1 049.6	1 117.4	18.3%
Intl. aviation bunkers	x	x	x	x	x	x	x	x	x	x	x	x
Intl. marine bunkers	x	x	x	x	x	x	x	x	x	0.1	0.1	x
Non-OECD Total	558.9	695.2	973.3	1 368.6	1 790.5	1 739.0	1 933.4	2 421.4	2 965.6	3 301.2	3 373.8	88.4%
OECD Total	1 485.3	1 554.9	1 736.6	1 702.4	1 888.9	2 244.7	2 617.7	2 784.5	3 060.8	3 134.8	3 231.2	71.1%
Canada	68.2	87.8	96.5	108.6	119.1	143.4	162.6	166.7	172.3	203.5	202.3	69.8%
Chile	1.3	1.1	1.4	1.6	0.9	1.0	6.7	10.6	8.7	8.3	8.7	827.7%
Mexico	19.6	24.5	40.5	50.5	48.4	56.3	82.0	109.2	135.2	144.2	146.2	202.2%
United States	1 195.9	1 061.7	1 085.4	949.2	994.9	1 144.1	1 234.2	1 180.5	1 287.0	1 450.3	1 464.5	47.2%
OECD Americas	1 285.0	1 175.1	1 223.9	1 110.0	1 163.3	1 344.8	1 485.4	1 466.9	1 603.2	1 806.4	1 821.7	56.6%
Australia	4.0	8.6	16.3	23.8	32.3	37.4	43.6	54.0	66.6	74.7	81.3	151.8%
Israel ²	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	10.2	16.8	19.3	+
Japan	8.6	19.3	51.5	81.9	114.5	137.5	165.3	173.9	216.5	251.8	260.9	127.9%
Korea	-	-	-	-	6.4	19.5	40.1	64.1	91.2	93.4	99.0	+
New Zealand	0.2	0.6	1.9	5.3	6.6	6.4	8.7	6.9	7.5	7.1	7.0	5.7%
OECD Asia Oceania	12.9	28.6	69.6	111.0	159.7	200.8	257.8	302.1	392.0	443.7	467.5	192.7%
Austria	5.4	7.1	8.3	9.5	11.4	14.5	14.7	18.2	18.2	15.4	16.1	40.4%
Belgium	11.3	17.4	19.6	16.2	18.3	23.4	29.5	31.9	36.8	30.4	31.4	71.0%
Czech Republic	1.9	3.1	5.6	9.2	11.5	14.6	17.1	17.9	17.3	14.7	16.0	38.8%
Denmark	-	0.0	0.0	1.5	4.2	7.4	10.4	10.5	10.3	6.7	6.8	62.5%
Estonia	..	..	..	..	2.4	1.1	1.3	1.6	1.3	0.9	1.0	-58.8%
Finland	-	1.5	1.7	1.9	5.1	6.6	8.0	8.4	8.3	4.6	4.1	-19.0%
France	17.7	30.8	44.2	51.1	53.4	62.8	77.9	91.5	94.6	78.6	86.3	61.8%
Germany	38.4	84.1	111.3	101.1	115.2	144.9	155.9	168.4	176.7	152.2	167.0	44.9%
Greece	-	-	-	0.0	0.1	0.1	3.7	5.2	6.7	5.4	7.7	+
Hungary	6.0	9.7	16.2	18.0	19.1	19.8	21.2	26.6	21.4	16.6	17.9	-6.2%
Iceland	-	-	-	-	-	-	-	-	-	-	-	-
Ireland	-	-	1.7	4.5	3.3	4.4	7.1	8.0	10.8	8.5	9.6	191.1%
Italy	24.1	41.0	46.4	57.0	87.1	101.9	133.2	162.5	157.4	127.9	134.2	54.2%
Latvia	..	..	..	..	5.6	2.3	2.5	3.2	3.4	2.6	2.6	-53.6%
Luxembourg	0.0	0.8	1.0	0.7	1.0	1.3	1.6	2.8	2.8	1.8	1.7	66.2%
Netherlands	47.3	69.1	67.0	72.4	69.0	76.8	77.1	78.5	87.2	62.3	65.4	-5.2%
Norway	-	0.4	2.0	2.8	4.6	8.1	7.4	9.3	13.5	12.6	12.4	168.2%
Poland	10.3	11.5	15.2	15.6	15.5	15.4	17.8	23.2	25.5	26.1	28.1	80.6%
Portugal	-	-	-	-	-	-	4.6	8.7	10.5	9.1	9.6	x
Slovak Republic	2.7	4.4	4.9	6.4	11.7	11.8	13.2	12.6	10.9	7.6	7.8	-33.8%
Slovenia	..	..	..	..	1.8	1.5	1.6	1.9	1.8	1.5	1.6	-8.8%
Spain	0.7	1.8	3.1	4.5	10.0	16.9	34.1	66.8	71.6	56.4	57.5	474.7%
Sweden	-	-	-	0.2	1.3	1.6	1.6	1.7	3.0	1.8	1.7	33.9%
Switzerland	0.0	1.0	1.9	2.9	3.8	5.1	5.7	6.5	7.1	6.7	7.1	86.3%
Turkey	-	-	-	0.1	6.3	12.2	28.9	52.3	73.3	91.5	87.3	+
United Kingdom	21.7	67.6	92.8	105.8	104.1	144.5	198.3	197.3	195.2	142.8	161.1	54.7%
OECD Europe	187.5	351.3	443.1	481.4	565.9	699.1	874.5	1 015.5	1 065.7	884.7	942.0	66.5%
<i>IEA/Accession/Association</i>	1 514.0	1 599.8	1 814.2	1 793.5	2 004.9	2 427.5	2 873.1	3 173.3	3 673.7	3 914.9	4 034.0	101.2%
<i>European Union - 28</i>	..	..	..	..	643.5	732.1	875.5	990.8	1 009.0	805.1	866.4	34.6%
<i>G20</i>	..	..	..	..	2 953.2	3 206.8	3 605.3	3 943.3	4 482.4	4 693.4	4 828.3	63.5%
<i>Africa</i>	5.3	9.0	25.6	44.3	58.8	74.5	98.0	148.9	179.1	224.1	228.7	289.0%
<i>Americas</i>	1 320.8	1 219.7	1 285.0	1 189.5	1 266.0	1 469.4	1 649.5	1 674.1	1 861.1	2 101.3	2 110.1	66.7%
<i>Asia</i>	50.5	89.0	171.0	240.3	575.8	750.5	984.9	1 377.8	1 933.9	2 340.9	2 420.6	320.4%
<i>Europe</i>	240.6	417.1	527.4	567.8	1 739.9	1 645.3	1 766.1	1 943.7	1 977.7	1 687.6	1 757.1	1.0%
<i>Oceania</i>	4.2	9.3	18.1	29.1	39.0	44.0	52.6	61.4	74.6	82.2	88.6	127.1%

1. Total world includes non-OECD total, OECD total as well as international marine bunkers and international aviation bunkers.

2. Please refer to the chapter Geographical coverage.

CO₂ emissions from fuel combustion - natural gas

 million tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Non-OECD Total	558.9	695.2	973.3	1 368.6	1 790.5	1 739.0	1 933.4	2 421.4	2 965.6	3 301.2	3 373.8	88.4%
Albania	0.2	0.6	0.8	0.8	0.5	0.1	0.0	0.0	0.0	0.1	0.1	-82.8%
Armenia	..	..	..	..	8.4	2.7	2.6	3.1	3.0	3.9	4.0	-52.0%
Azerbaijan	..	..	..	..	32.2	15.5	10.4	17.2	16.1	20.2	20.3	-36.9%
Belarus	..	..	..	..	24.7	23.7	30.9	36.8	39.5	33.8	33.7	36.8%
Bosnia and Herzegovina	..	..	..	..	0.9	0.3	0.5	0.7	0.5	0.4	0.4	-53.6%
Bulgaria	0.6	2.3	7.5	10.8	11.0	9.2	6.0	5.7	4.8	5.1	5.1	-53.8%
Croatia	..	..	..	..	4.2	3.4	4.0	4.5	5.1	3.7	3.9	-5.6%
Cyprus ¹	..	..	..	..	-	-	-	-	-	-	-	-
FYR of Macedonia	..	..	..	..	-	-	0.1	0.1	0.2	0.3	0.4	x
Georgia	..	..	..	..	10.7	2.2	2.2	1.9	2.1	3.9	3.7	-65.1%
Gibraltar	..	..	..	..	-	-	-	-	-	-	-	-
Kazakhstan	..	..	..	..	24.9	23.6	15.3	28.6	53.8	62.0	62.0	148.6%
Kosovo	..	..	..	..	..	..	-	-	-	-	-	..
Kyrgyzstan	..	..	..	..	3.6	1.7	1.3	1.2	0.5	0.5	0.5	-84.6%
Lithuania	..	..	..	..	9.4	3.5	3.5	4.6	4.7	2.6	2.4	-74.9%
Malta	..	..	..	..	-	-	-	-	-	-	-	-
Republic of Moldova	..	..	..	..	7.6	6.5	4.8	5.5	5.3	4.9	4.9	-35.3%
Montenegro	..	..	..	..	..	..	-	-	-	-	-	..
Romania	52.3	63.0	76.1	75.0	67.7	42.3	29.5	28.7	22.6	19.8	19.9	-70.7%
Russian Federation	..	..	..	..	837.6	709.6	695.3	753.8	802.8	765.4	773.5	-7.7%
Serbia	..	..	..	..	6.1	2.8	3.2	4.0	3.8	3.5	3.6	-40.6%
Tajikistan	..	..	..	..	3.3	1.2	1.5	1.3	0.4	0.0	0.0	-99.8%
Turkmenistan	..	..	..	..	28.8	26.3	25.6	33.5	40.7	50.1	50.1	74.2%
Ukraine	..	..	..	..	210.5	156.9	142.7	136.1	96.0	54.7	54.4	-74.1%
Uzbekistan	..	..	..	..	75.9	71.6	91.0	89.2	82.0	75.2	72.5	-4.5%
Former Soviet Union	421.5	503.8	677.9	988.9	..	..	..	..	..	..	..	..
Former Yugoslavia	1.3	2.1	5.0	11.0	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia	475.9	571.8	767.1	1 086.5	1 368.0	1 103.2	1 070.5	1 156.6	1 183.8	1 110.3	1 115.7	-18.4%
Algeria	2.4	4.6	13.5	21.8	26.2	31.3	35.9	45.0	51.3	72.6	72.2	175.4%
Angola	0.1	0.1	0.2	0.2	1.0	1.1	1.1	1.2	1.4	1.5	1.5	48.1%
Benin	..	..	..	..	-	-	-	-	-	-	-	-
Botswana	..	..	..	..	-	-	-	-	-	-	-	-
Cameroon	..	..	..	..	-	-	-	-	0.5	1.0	1.0	x
Congo	0.0	0.0	-	0.0	-	-	-	0.0	0.2	0.5	0.5	x
Côte d'Ivoire	..	..	..	..	-	0.1	3.0	2.9	3.1	4.0	4.4	x
Dem. Rep. of the Congo	..	..	..	..	-	-	-	-	0.0	0.0	0.0	x
Egypt	0.2	0.1	2.8	6.6	13.4	20.8	29.8	62.8	73.8	78.1	81.5	508.7%
Eritrea	..	..	..	..	..	..	..	..	..	..	..	..
Ethiopia	..	..	..	..	-	-	-	-	-	-	-	-
Gabon	..	..	0.0	0.1	0.2	0.3	0.2	0.3	0.6	0.7	0.8	287.6%
Ghana	..	..	..	..	-	-	-	-	0.8	2.5	1.1	x
Kenya	..	..	..	..	-	-	-	-	-	-	-	-
Libya	2.1	2.5	5.3	6.2	8.1	7.0	6.9	8.4	10.2	11.2	12.5	54.5%
Mauritius	..	..	..	..	-	-	-	-	-	-	-	-
Morocco	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.9	1.3	2.4	2.4	+
Mozambique	..	..	..	..	-	0.0	0.0	0.0	0.2	1.5	1.6	x
Namibia	..	..	..	..	..	..	..	..	..	..	..	..
Niger	..	..	..	..	..	..	..	..	..	..	..	..
Nigeria	0.4	1.0	2.9	7.0	6.9	9.3	14.7	18.7	19.3	29.4	30.3	337.4%
Senegal	..	..	..	..	0.0	0.1	0.0	0.0	0.0	0.0	0.0	239.0%
South Africa	..	..	..	..	-	-	-	-	1.9	4.1	4.0	x
South Sudan	..	..	..	..	..	..	..	..	..	..	..	..
Sudan	..	..	..	..	-	-	-	-	-	-	-	-
United Rep. of Tanzania	..	..	..	..	-	-	-	0.8	1.5	1.7	1.6	x
Togo	..	..	..	..	-	-	-	-	-	-	-	-
Tunisia	0.0	0.5	0.8	2.2	2.8	4.6	6.4	7.8	11.9	11.8	12.2	334.3%
Zambia	..	..	..	..	-	-	-	-	-	-	-	-
Zimbabwe	..	..	..	..	-	-	-	-	-	-	-	-
Other Africa	..	..	..	..	-	-	0.0	0.1	0.9	1.0	1.0	x
Africa	5.3	9.0	25.6	44.3	58.8	74.5	98.0	148.9	179.1	224.1	228.7	289.0%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions from fuel combustion - natural gasmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Bangladesh	0.3	0.6	1.5	3.1	5.4	8.1	11.7	19.1	35.8	45.8	50.9	845.2%
Brunei Darussalam	0.2	1.2	2.1	2.3	2.5	3.4	3.2	3.5	5.1	4.1	4.5	78.6%
Cambodia	..	..	..	..	..	..	..	..	..	..	..	..
DPR of Korea	-	-	-	-	-	-	-	-	-	-	-	-
India	1.0	1.3	1.8	4.7	13.1	25.0	36.2	54.3	95.7	53.7	63.0	380.1%
Indonesia	0.1	0.5	5.4	8.7	24.3	47.4	45.4	50.9	71.3	77.8	75.5	210.2%
Malaysia	0.0	0.1	0.2	4.6	6.8	24.1	48.5	63.9	63.1	70.6	62.9	829.6%
Mongolia	..	..	..	-	-	-	-	-	-	-	-	-
Myanmar	0.1	0.3	0.6	1.6	1.6	2.7	2.6	3.0	3.0	6.6	8.2	417.6%
Nepal	-	-	-	-	-	-	-	-	-	-	-	-
Pakistan	4.9	7.2	8.9	10.8	17.9	25.6	30.9	52.6	52.5	54.2	51.6	188.3%
Philippines	-	-	-	-	-	0.0	0.0	6.7	7.2	6.8	7.7	x
Singapore	0.0	0.1	0.1	0.1	0.1	3.2	2.9	13.3	16.7	20.1	20.5	+
Sri Lanka	-	-	-	-	-	-	-	-	-	-	-	-
Chinese Taipei	1.6	2.2	3.3	1.5	3.0	7.4	12.9	20.8	30.6	36.6	38.3	+
Thailand	-	-	-	6.9	11.7	20.5	40.8	60.9	74.8	84.8	82.6	604.0%
Viet Nam	-	-	-	0.1	0.0	0.4	2.6	11.0	19.1	22.4	22.3	+
Other non-OECD Asia	0.5	0.5	0.2	1.2	0.6	0.5	0.5	0.5	0.9	0.6	0.7	14.0%
Asia (excl. China)	8.7	14.0	24.2	45.7	87.1	168.2	238.3	360.6	475.6	483.9	488.6	460.9%
People's Rep. of China	7.4	17.4	28.1	16.2	19.8	26.8	35.8	70.4	183.6	341.3	370.4	+
Hong Kong, China	0.1	0.1	0.2	0.4	0.8	1.2	7.1	6.5	8.0	6.9	7.1	827.8%
China	7.4	17.5	28.3	16.6	20.6	28.0	42.9	76.9	191.5	348.2	377.5	+
Argentina	12.1	17.1	21.7	30.4	43.4	52.2	70.2	77.2	87.3	96.6	99.6	129.7%
Bolivia	0.1	0.3	0.6	0.8	1.5	2.3	2.4	3.4	5.7	7.7	8.7	496.6%
Brazil	0.5	1.0	1.6	3.7	5.7	7.5	16.4	37.1	49.9	76.7	65.8	+
Colombia	2.6	3.3	5.7	7.4	7.6	8.4	12.8	14.4	18.5	19.8	24.4	223.3%
Costa Rica	-	-	-	-	-	-	-	-	-	-	-	-
Cuba	0.1	0.2	0.1	0.1	0.1	0.2	1.1	1.4	2.0	2.4	2.2	+
Curaçao ¹	-	-	-	-	-	-	-	-	-	-	-	-
Dominican Republic	-	-	-	-	-	-	-	0.4	1.6	2.2	2.1	x
Ecuador	-	-	-	-	-	-	-	0.7	1.0	1.3	1.4	x
El Salvador	-	-	-	-	-	-	-	-	-	-	-	-
Guatemala	-	-	-	-	-	-	-	-	-	-	-	-
Haiti	-	-	-	-	-	-	-	-	-	-	-	-
Honduras	-	-	-	-	-	-	-	-	-	-	-	-
Jamaica	-	-	-	-	-	-	-	-	-	-	-	-
Nicaragua	-	-	-	-	-	-	-	-	-	-	-	-
Panama	-	-	-	-	-	-	-	-	-	-	-	-
Paraguay	-	-	-	-	-	-	-	-	-	-	-	-
Peru	0.6	0.8	1.0	1.3	1.0	0.6	1.1	3.9	12.9	18.0	18.9	+
Suriname	..	..	..	..	..	..	..	..	..	..	..	..
Trinidad and Tobago	2.8	2.3	3.9	4.5	5.8	6.0	7.5	13.6	17.6	16.9	15.7	167.8%
Uruguay	-	-	-	-	-	-	0.1	0.2	0.1	0.1	0.1	x
Venezuela	16.9	19.7	26.5	31.2	37.6	47.3	51.7	53.6	59.7	50.0	46.2	22.8%
Other non-OECD Americas	0.0	-	0.0	0.1	0.0	0.0	0.7	1.4	1.6	3.3	3.4	+
Non-OECD Americas	35.8	44.7	61.1	79.5	102.7	124.6	164.1	207.2	257.9	294.9	288.4	180.8%
Bahrain	1.8	4.1	5.7	7.5	8.7	11.2	13.4	17.1	21.7	25.7	25.2	189.3%
Islamic Republic of Iran	5.5	8.1	8.6	16.9	33.8	76.3	118.0	189.7	274.3	342.5	365.5	981.9%
Iraq	1.8	3.2	2.5	1.6	3.8	6.1	6.0	3.5	9.8	12.8	14.1	272.2%
Jordan	-	-	-	-	0.2	0.5	0.5	3.3	5.4	4.6	8.0	+
Kuwait	10.0	9.9	13.2	9.7	11.6	17.8	18.4	23.6	27.9	40.1	42.7	269.1%
Lebanon	-	-	-	-	-	-	-	-	0.5	-	-	-
Oman	-	-	0.7	2.1	4.9	6.8	11.7	14.8	31.1	45.6	46.0	829.9%
Qatar	1.9	4.2	5.6	9.1	10.5	14.4	18.5	26.6	43.0	62.6	62.9	497.5%
Saudi Arabia	2.7	5.4	20.9	28.8	43.2	54.7	66.8	101.5	130.9	156.4	161.7	274.1%
Syrian Arab Republic	-	-	0.1	0.3	3.2	4.0	7.4	8.9	15.7	7.3	6.4	98.1%
United Arab Emirates	2.1	3.3	9.7	19.9	33.3	48.8	58.8	82.2	115.4	140.6	141.5	324.8%
Yemen	-	-	-	-	-	-	-	-	1.9	1.7	1.0	x
Middle East	25.8	38.2	67.0	96.0	153.3	240.5	319.6	471.2	677.6	839.8	875.0	470.7%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions from international marine bunkers

 million tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
World	353.87	341.12	357.06	306.30	371.71	428.23	498.45	571.46	662.66	662.15	682.35	83.6%
<i>Annex I Parties</i>	..	..	..	..	236.70	231.50	252.96	271.85	268.65	252.40	250.98	6.0%
<i>Annex II Parties</i>	205.24	219.57	237.69	173.47	226.16	227.96	247.18	262.31	254.34	198.55	204.44	-9.6%
<i>North America</i>	26.69	36.50	94.90	57.03	94.53	94.67	93.21	85.48	85.71	54.23	55.23	-41.6%
<i>Europe</i>	121.89	111.95	98.49	89.15	110.51	111.18	133.07	153.02	150.52	126.88	131.54	19.0%
<i>Asia Oceania</i>	56.66	71.11	44.30	27.30	21.12	22.11	20.91	23.81	18.12	17.45	17.67	-16.3%
<i>Annex I EIT</i>	..	..	..	..	9.88	2.60	1.82	3.18	7.91	45.45	37.24	276.9%
<i>Non-Annex I Parties</i>	..	..	..	..	135.01	196.73	245.49	299.62	394.01	409.76	431.37	219.5%
<i>Annex B Kyoto Parties</i>	..	..	..	..	116.90	116.96	140.57	161.98	161.01	138.51	144.26	23.4%
Non-OECD Total	144.31	118.10	115.53	127.42	135.56	172.55	211.53	263.05	370.96	424.12	434.59	220.6%
OECD Total	209.57	223.02	241.53	178.87	236.15	255.68	286.92	308.42	291.70	238.03	247.76	4.9%
Canada	3.10	2.61	4.76	1.19	2.90	3.20	3.37	2.86	2.20	0.69	1.33	-54.1%
Chile	0.61	0.37	0.27	0.09	0.58	1.13	1.96	3.33	1.30	0.41	0.42	-27.3%
Mexico	0.26	0.39	1.01	1.34	-	2.58	3.88	2.73	2.53	2.65	2.79	x
United States	23.59	33.90	90.14	55.84	91.64	91.47	89.84	82.62	83.51	53.54	53.90	-41.2%
OECD Americas	27.56	37.26	96.19	58.46	95.11	98.37	99.05	91.54	89.53	57.29	58.44	-38.6%
Australia	5.15	5.08	3.72	2.31	2.16	2.82	2.99	2.76	2.18	2.44	2.05	-5.0%
Israel ¹	-	-	-	0.35	0.38	0.65	0.59	0.81	1.07	0.82	0.48	26.5%
Japan	50.46	64.93	39.39	24.25	17.91	18.15	17.15	20.05	14.85	13.92	14.65	-18.2%
Korea	1.54	0.17	0.31	1.71	5.32	21.58	30.78	33.59	29.05	30.38	34.04	539.4%
New Zealand	1.05	1.09	1.19	0.74	1.05	1.14	0.76	1.00	1.08	1.08	0.97	-7.9%
OECD Asia Oceania	58.21	71.28	44.61	29.36	26.83	44.34	52.27	58.22	48.24	48.64	52.20	94.6%
Austria	-	-	-	-	0.05	0.06	0.07	0.08	0.07	0.05	0.06	12.5%
Belgium	8.17	8.76	7.64	7.41	13.04	12.44	17.20	24.65	24.55	18.65	21.39	64.0%
Czech Republic	-	-	-	-	-	-	-	-	-	-	-	-
Denmark	2.11	1.69	1.34	1.36	3.05	5.02	4.08	2.43	2.19	2.42	2.10	-31.2%
Estonia	..	..	..	..	0.57	0.28	0.33	0.38	0.70	0.93	0.87	50.9%
Finland	0.24	0.31	1.86	1.47	1.80	1.05	2.12	1.61	0.67	0.94	0.91	-49.3%
France	12.90	14.72	12.72	7.66	7.86	6.79	8.99	8.25	7.41	5.22	4.70	-40.2%
Germany	13.14	10.71	11.23	11.06	7.95	6.58	6.99	7.93	8.84	7.61	8.90	11.9%
Greece	1.90	2.83	2.66	3.54	8.12	11.34	11.46	9.15	8.73	5.73	5.53	-31.9%
Hungary	-	-	-	-	-	-	-	-	-	-	-	-
Iceland	-	-	-	0.02	0.10	0.14	0.21	0.20	0.18	0.15	0.18	85.6%
Ireland	0.24	0.21	0.24	0.09	0.06	0.37	0.47	0.33	0.26	0.49	0.47	729.2%
Italy	23.11	18.22	13.30	10.93	8.53	7.76	5.30	7.24	9.60	6.12	7.13	-16.4%
Latvia	..	..	..	..	1.50	0.48	0.03	0.82	0.80	0.80	0.99	-33.7%
Luxembourg	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	28.62	33.29	29.79	27.83	34.95	34.71	41.43	49.22	43.65	39.60	39.26	12.4%
Norway	1.94	1.52	0.89	1.04	1.41	2.22	2.59	2.19	1.05	0.42	0.27	-80.9%
Poland	1.65	2.23	2.24	1.65	1.25	0.44	0.91	1.02	0.69	0.60	0.57	-54.4%
Portugal	2.34	2.02	1.36	1.50	1.93	1.53	2.11	1.84	1.48	2.06	2.02	4.9%
Slovak Republic	-	-	-	-	-	-	-	-	-	-	-	-
Slovenia	..	..	..	..	-	-	-	0.07	0.06	0.20	0.38	x
Spain	6.01	3.48	5.13	6.84	11.58	10.10	19.17	25.27	26.81	23.78	23.92	106.6%
Sweden	3.62	3.49	2.69	1.77	2.11	3.33	4.33	6.19	6.26	5.75	6.33	199.5%
Switzerland	-	-	-	-	0.06	0.05	0.03	0.04	0.03	0.02	0.02	-72.2%
Turkey	0.27	0.29	-	0.25	0.38	0.58	1.27	3.34	1.16	2.69	2.77	636.8%
United Kingdom	17.55	10.71	7.65	6.63	7.92	7.70	6.51	6.41	8.75	7.87	8.35	5.4%
OECD Europe ¹	123.80	114.48	100.73	91.05	114.21	112.96	135.60	158.66	153.93	132.10	137.12	20.1%
<i>IEA/Accession/Association</i>	224.10	240.05	264.65	202.55	279.33	311.37	372.08	424.84	469.78	431.95	452.22	61.9%
<i>European Union - 28</i>	..	..	..	..	113.18	111.73	134.74	156.79	157.56	135.19	141.29	24.8%
<i>G20</i>	..	..	..	..	267.18	293.14	332.90	371.58	404.20	383.38	386.78	44.8%
<i>Africa</i>	22.21	16.04	16.67	14.02	16.66	24.36	23.59	20.57	18.83	19.09	18.92	13.6%
<i>Americas</i>	58.39	61.52	117.30	77.86	114.89	122.75	132.35	129.65	136.72	102.31	101.13	-12.0%
<i>Asia</i>	125.92	124.49	98.46	100.98	110.74	156.96	193.04	246.06	327.06	347.63	372.30	236.2%
<i>Europe</i>	127.26	118.12	105.02	96.26	126.00	119.90	145.39	170.98	176.37	189.12	186.48	48.0%
<i>Oceania</i>	6.78	6.71	5.37	3.25	3.42	4.26	4.09	4.21	3.67	4.01	3.52	2.8%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions from international marine bunkersmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Non-OECD Total	144.31	118.10	115.53	127.42	135.56	172.55	211.53	263.05	370.96	424.12	434.59	220.6%
Albania	-	-	-	-	-	-	-	-	-	0.06	0.11	x
Armenia	..	..	..	..	-	-	-	-	-	-	-	-
Azerbaijan	..	..	..	..	-	-	-	-	0.23	0.16	0.15	x
Belarus	..	..	..	..	-	-	-	-	-	-	-	-
Bosnia and Herzegovina	..	..	..	..	-	-	-	-	-	-	-	-
Bulgaria	-	-	-	0.72	0.18	0.86	0.20	0.35	0.31	0.27	0.25	34.2%
Croatia	..	..	..	..	0.15	0.10	0.06	0.08	0.02	0.01	0.02	-89.3%
Cyprus ¹	0.01	0.07	0.05	0.11	0.18	0.21	0.60	0.91	0.58	0.76	0.90	395.7%
FYR of Macedonia	..	..	..	..	-	-	-	-	-	-	-	-
Georgia	..	..	..	..	-	0.16	-	-	-	-	-	-
Gibraltar	3.54	3.85	4.20	4.68	5.51	5.98	8.41	12.67	13.29	11.71	11.90	115.9%
Kazakhstan	..	..	..	..	-	-	-	-	-	0.30	0.45	x
Kosovo	..	..	..	..	..	..	-	-	-	-	-	..
Kyrgyzstan	..	..	..	..	-	-	-	-	-	-	-	-
Lithuania	..	..	..	..	0.30	0.45	0.29	0.46	0.45	0.24	0.52	72.5%
Malta	0.19	0.08	0.09	0.06	0.09	0.14	2.09	2.11	4.65	4.94	5.63	+
Republic of Moldova	..	..	..	..	-	-	-	-	-	-	-	-
Montenegro	..	..	..	..	..	..	-	-	-	-	-	..
Romania	-	-	-	-	-	-	-	-	0.05	0.14	0.10	x
Russian Federation	..	..	..	..	5.93	-	-	-	4.84	42.26	33.55	466.0%
Serbia	..	..	..	..	-	-	-	-	-	0.08	0.06	x
Tajikistan	..	..	..	..	-	-	-	-	-	-	-	-
Turkmenistan	..	..	..	..	-	-	-	-	-	-	-	-
Ukraine	..	..	..	..	-	-	-	-	-	-	-	-
Uzbekistan	..	..	..	..	-	-	-	-	-	-	-	-
Former Soviet Union	13.31	14.24	14.24	13.93	..	..	..	..	..	..	..	..
Former Yugoslavia	-	-	-	-	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia	17.05	18.24	18.58	19.50	12.34	7.89	11.66	16.58	24.42	60.93	53.63	334.5%
Algeria	0.62	0.78	1.30	1.17	1.37	1.18	0.78	1.18	1.02	0.87	0.75	-45.5%
Angola	0.78	0.49	0.84	0.11	0.02	0.03	-	0.34	0.56	1.28	1.09	+
Benin	-	-	-	-	-	-	-	-	-	-	-	-
Botswana	..	..	..	-	-	-	-	-	-	-	-	-
Cameroon	-	-	0.12	0.03	0.04	0.09	0.06	0.04	0.14	-	-	-100.0%
Congo	-	-	-	-	-	-	-	-	-	-	-	-
Côte d'Ivoire	0.06	0.01	1.36	0.73	0.12	0.27	0.29	0.36	0.06	0.23	0.25	107.7%
Dem. Rep. of the Congo	0.41	0.22	0.08	0.09	0.11	0.01	-	-	-	-	-	-100.0%
Egypt	0.06	1.11	3.28	4.83	5.39	7.93	8.79	4.63	1.40	0.58	0.61	-88.8%
Eritrea	..	..	..	..	..	0.43	-	-	-	-	-	..
Ethiopia	0.07	0.02	0.01	0.03	0.03	0.03	-	-	-	-	-	-100.0%
Gabon	0.20	0.14	0.20	0.23	0.08	0.44	0.61	0.61	0.66	0.58	0.57	614.9%
Ghana	0.16	0.14	0.10	-	-	-	0.16	0.12	0.13	-	-	-
Kenya	1.49	1.07	0.57	0.45	0.56	0.17	0.21	0.22	0.12	0.13	0.14	-74.9%
Libya	0.01	0.01	0.02	0.04	0.25	0.28	0.86	1.16	1.17	0.26	0.26	6.3%
Mauritius	0.05	0.11	0.17	0.22	0.19	0.27	0.69	0.60	0.75	0.89	1.06	456.9%
Morocco	0.24	0.18	0.21	0.04	0.06	0.04	0.05	0.07	0.43	0.43	0.43	568.8%
Mozambique	0.76	0.36	0.27	0.10	0.09	0.01	0.00	0.01	-	-	-	-100.0%
Namibia	..	..	..	..	..	-	-	-	-	-	-	..
Niger	..	..	..	..	..	..	-	-	-	-	-	..
Nigeria	0.02	0.12	0.25	0.35	0.59	1.43	1.21	1.29	1.32	1.18	0.98	67.5%
Senegal	3.02	2.11	0.85	0.33	0.11	0.09	0.30	0.36	0.21	0.38	0.44	287.3%
South Africa	10.92	7.22	5.31	3.44	6.02	10.41	8.60	8.61	9.83	10.96	10.97	82.4%
South Sudan	..	..	..	..	..	..	..	..	..	..	..	..
Sudan	-	0.01	0.02	0.02	0.02	0.03	0.03	0.04	0.06	0.07	0.07	228.6%
United Rep. of Tanzania	0.05	0.05	0.12	0.08	0.08	0.07	0.08	0.11	0.14	0.20	0.22	168.9%
Togo	-	-	-	-	-	-	0.01	0.01	0.05	0.06	0.06	x
Tunisia	0.06	0.02	0.02	0.01	0.07	0.06	0.06	0.05	0.04	0.01	0.01	-90.7%
Zambia	-	-	-	-	-	-	-	-	-	-	-	-
Zimbabwe	-	-	-	-	-	-	-	-	-	-	-	-
Other Africa	3.23	1.88	1.58	1.72	1.47	1.10	0.79	0.76	0.77	0.99	1.00	-31.9%
Africa	22.21	16.04	16.67	14.02	16.66	24.36	23.59	20.57	18.83	19.09	18.92	13.6%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions from international marine bunkers

 million tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Bangladesh	0.07	0.05	0.19	0.07	0.06	0.11	0.14	0.18	0.25	0.33	0.36	470.6%
Brunei Darussalam	-	-	0.00	-	0.12	0.21	0.22	0.27	0.28	0.29	0.12	5.4%
Cambodia	..	..	..	..	..	-	-	-	-	-	-	..
DPR of Korea	-	-	-	-	-	-	-	-	-	-	-	-
India	0.72	0.58	0.73	0.34	1.38	1.71	2.20	3.09	4.27	4.49	4.81	249.6%
Indonesia	0.71	1.10	0.80	0.69	1.70	1.30	0.36	0.43	0.56	0.74	0.78	-54.4%
Malaysia	0.11	0.22	0.19	0.31	0.30	0.54	0.70	0.19	0.19	1.12	0.96	226.4%
Mongolia	..	..	..	-	-	-	-	-	-	-	-	-
Myanmar	0.01	0.00	-	-	-	0.01	0.01	0.01	0.01	0.01	-	-
Nepal	-	-	-	-	-	-	-	-	-	-	-	-
Pakistan	0.29	0.22	0.47	0.08	0.11	0.05	0.08	0.26	0.56	0.16	0.17	58.8%
Philippines	1.31	0.45	0.59	0.50	0.21	0.36	0.68	0.38	0.59	0.09	0.16	-22.4%
Singapore	8.98	10.54	15.11	15.30	34.23	35.65	58.18	79.43	127.27	140.67	151.46	342.5%
Sri Lanka	1.20	1.30	1.12	1.02	1.22	1.10	0.51	0.54	0.66	1.30	1.93	57.6%
Chinese Taipei	0.39	0.33	0.67	1.64	4.90	7.64	11.11	7.57	5.50	3.40	4.01	-18.3%
Thailand	0.21	0.26	0.51	0.66	1.72	3.05	2.49	5.23	4.47	3.78	3.99	132.3%
Viet Nam	-	-	-	0.07	0.09	0.22	0.46	0.80	1.03	0.52	0.66	666.7%
Other non-OECD Asia	0.57	0.54	0.47	0.20	0.21	0.30	0.33	0.44	0.41	0.87	0.88	318.9%
Asia (excl. China)	14.57	15.59	20.84	20.88	46.23	52.24	77.48	98.82	146.04	157.75	170.29	268.3%
People's Rep. of China	2.41	2.82	3.32	3.95	4.34	8.96	9.58	16.31	27.92	29.84	31.28	621.1%
Hong Kong, China	2.00	1.72	2.88	3.14	4.57	7.24	10.73	17.98	39.00	27.48	28.63	526.4%
China	4.41	4.54	6.20	7.09	8.91	16.20	20.30	34.29	66.91	57.32	59.91	572.5%
Argentina	0.66	0.29	1.34	2.02	2.25	1.73	1.50	2.22	3.80	2.93	2.23	-0.8%
Bolivia	-	-	-	-	-	-	-	-	-	-	-	-
Brazil	1.01	1.18	1.43	1.73	1.73	3.67	9.25	11.04	12.74	13.30	10.96	532.0%
Colombia	0.96	0.50	0.31	0.22	0.33	0.58	0.75	1.15	2.04	0.80	1.05	216.4%
Costa Rica	0.10	-	0.13	0.14	0.24	0.37	0.34	0.36	0.09	0.00	-	-100.0%
Cuba	-	-	-	0.12	0.06	0.04	0.05	0.06	2.41	2.08	2.01	+
Curaçao ¹	7.79	7.42	7.35	6.19	5.23	5.37	6.35	6.78	7.26	5.04	5.02	-4.0%
Dominican Republic	-	-	-	-	-	-	-	-	-	-	-	-
Ecuador	0.28	-	0.35	0.12	0.50	1.00	0.88	2.10	1.72	1.09	0.91	82.5%
El Salvador	-	-	-	-	-	-	-	-	-	-	-	-
Guatemala	0.18	0.27	0.41	0.39	0.43	0.53	0.64	0.75	0.90	1.08	1.12	159.7%
Haiti	-	-	-	-	-	-	-	-	-	-	-	-
Honduras	-	-	-	-	-	-	-	-	0.00	0.02	0.02	x
Jamaica	0.16	0.27	0.10	0.04	0.10	0.12	0.12	0.26	0.27	0.63	0.68	576.1%
Nicaragua	-	-	-	-	-	-	-	-	-	-	-	-
Panama	1.70	3.40	3.09	4.02	4.94	6.42	8.15	7.37	9.56	11.60	12.50	153.1%
Paraguay	-	-	-	-	-	-	-	-	-	-	-	-
Peru	0.07	0.08	0.09	0.09	0.08	0.12	0.18	0.29	0.34	0.35	0.45	440.7%
Suriname	..	..	..	..	..	..	0.07	0.11	0.13	0.16	0.14	..
Trinidad and Tobago	5.18	3.58	1.44	0.31	0.11	0.16	1.21	1.49	1.08	1.58	1.81	+
Uruguay	0.28	0.20	0.25	0.33	0.37	1.22	0.93	1.14	1.43	0.56	0.46	23.5%
Venezuela	9.23	4.87	2.01	1.78	2.53	2.32	2.08	2.36	2.82	2.84	2.33	-7.7%
Other non-OECD Americas	3.25	2.21	2.82	1.89	0.87	0.72	0.80	0.64	0.59	0.96	0.98	12.8%
Non-OECD Americas	30.83	24.26	21.11	19.39	19.78	24.37	33.30	38.10	47.19	45.03	42.69	115.9%
Bahrain	0.56	0.56	0.61	0.48	0.25	0.26	0.25	0.24	0.25	0.26	0.25	-1.2%
Islamic Republic of Iran	1.05	1.28	1.26	0.93	1.27	1.90	2.26	2.95	7.38	15.05	15.64	+
Iraq	0.26	0.30	0.37	0.47	0.40	0.02	0.49	0.33	0.44	0.70	0.88	118.5%
Jordan	-	-	-	-	-	0.03	0.14	0.25	0.05	0.02	0.02	x
Kuwait	6.36	6.38	5.66	2.40	0.56	1.84	1.44	2.17	1.70	3.87	3.47	519.3%
Lebanon	0.72	0.03	-	-	-	0.04	0.05	0.06	0.09	0.10	0.10	x
Oman	3.89	2.57	0.72	0.35	0.06	0.08	0.20	0.12	3.62	4.01	5.22	+
Qatar	-	-	-	-	-	-	-	-	-	-	-	-
Saudi Arabia	40.47	26.14	13.77	28.31	5.80	6.02	6.67	7.16	8.19	9.89	10.74	85.3%
Syrian Arab Republic	0.78	1.27	1.99	2.56	2.85	3.47	3.72	3.20	3.47	0.55	0.50	-82.6%
United Arab Emirates	-	-	5.59	9.79	19.19	33.51	29.69	37.83	42.03	49.34	52.17	171.8%
Yemen	1.14	0.92	2.16	1.25	1.25	0.32	0.31	0.36	0.35	0.21	0.16	-87.2%
Middle East	55.24	39.45	32.13	46.54	31.64	47.48	45.20	54.68	67.56	84.01	89.15	181.8%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions from international aviation bunkersmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
World	169.21	173.87	202.13	224.90	258.94	290.33	355.59	422.74	457.56	531.78	557.74	115.4%
<i>Annex I Parties</i>	..	..	..	..	171.24	181.74	226.52	257.10	254.59	276.88	284.92	66.4%
<i>Annex II Parties</i>	59.17	62.37	71.49	82.30	132.44	161.20	206.40	231.65	225.12	243.57	251.78	90.1%
<i>North America</i>	16.77	17.70	21.39	22.05	41.92	49.03	60.81	71.41	68.72	73.54	75.61	80.4%
<i>Europe</i>	36.32	38.05	43.13	49.09	71.41	87.98	116.78	128.27	127.39	136.54	141.23	97.8%
<i>Asia Oceania</i>	6.07	6.61	6.96	11.16	19.12	24.20	28.80	31.97	29.01	33.49	34.94	82.8%
<i>Annex I EIT</i>	..	..	..	..	37.32	18.73	17.37	21.04	24.69	21.58	21.71	-41.8%
<i>Non-Annex I Parties</i>	..	..	..	..	87.70	108.58	129.07	165.64	202.97	254.90	272.81	211.1%
<i>Annex B Kyoto Parties</i>	..	..	..	..	90.08	100.19	129.40	143.69	145.36	156.60	162.71	80.6%
Non-OECD Total	104.93	105.00	120.73	131.85	115.44	114.42	132.03	164.41	200.84	245.67	260.99	126.1%
OECD Total	64.29	68.87	81.40	93.05	143.50	175.90	223.56	258.33	256.72	286.11	296.74	106.8%
Canada	1.27	1.95	1.36	1.23	2.73	2.61	3.12	2.51	3.41	2.59	1.90	-30.3%
Chile	0.44	0.35	0.55	0.50	0.57	0.65	1.06	1.07	1.54	1.70	1.75	206.1%
Mexico	1.40	2.42	4.28	4.58	5.29	6.83	8.13	8.60	8.16	10.33	11.12	110.4%
United States	15.51	15.76	20.03	20.82	39.19	46.42	57.69	68.90	65.31	70.95	73.71	88.1%
OECD Americas	18.62	20.48	26.22	27.12	47.77	56.50	70.00	81.08	78.42	85.56	88.48	85.2%
Australia	1.59	1.91	2.43	2.79	4.34	5.80	7.22	8.16	10.19	11.65	12.26	182.6%
Israel ¹	1.81	1.90	2.23	2.02	1.60	2.15	2.40	3.24	2.43	2.70	2.91	81.5%
Japan	3.83	4.36	3.96	7.71	13.45	16.78	19.77	21.58	16.48	19.33	20.09	49.4%
Korea	-	0.37	0.83	1.71	0.85	2.07	1.71	7.32	12.01	13.19	14.74	+
New Zealand	0.65	0.34	0.58	0.66	1.33	1.61	1.81	2.23	2.33	2.52	2.59	94.5%
OECD Asia Oceania	7.88	8.88	10.03	14.89	21.57	28.41	32.92	42.53	43.45	49.38	52.58	143.8%
Austria	0.28	0.25	0.39	0.65	0.86	1.29	1.65	1.91	2.00	2.08	2.27	162.3%
Belgium	1.23	1.06	1.24	1.64	2.84	2.63	4.42	3.83	4.12	4.35	4.30	51.4%
Czech Republic	0.70	0.59	0.86	0.64	0.66	0.57	0.48	0.95	0.93	0.88	0.94	42.9%
Denmark	1.94	1.57	1.61	1.57	1.72	1.85	2.31	2.53	2.40	2.61	2.81	63.2%
Estonia	..	..	..	..	0.10	0.05	0.06	0.14	0.11	0.07	0.06	-38.2%
Finland	0.18	0.40	0.46	0.49	0.98	0.87	1.03	1.25	1.60	1.90	1.91	94.1%
France	4.62	5.77	5.67	6.50	9.42	11.56	15.22	16.27	16.49	17.78	17.55	86.4%
Germany	7.65	8.24	8.30	9.55	13.31	15.64	19.33	22.39	23.90	24.09	25.91	94.7%
Greece	1.31	1.33	2.25	2.36	2.36	2.55	2.44	2.33	2.04	2.47	2.63	11.3%
Hungary	0.15	0.21	0.37	0.45	0.49	0.54	0.70	0.80	0.70	0.54	0.57	16.3%
Iceland	0.22	0.14	0.09	0.18	0.22	0.20	0.40	0.40	0.37	0.66	0.89	309.9%
Ireland	0.97	0.74	0.61	0.57	1.04	1.12	1.74	2.38	2.16	2.45	2.53	142.5%
Italy	3.50	2.46	4.19	4.38	4.54	5.86	8.46	8.97	9.48	9.48	9.87	117.3%
Latvia	..	..	..	..	0.22	0.08	0.08	0.18	0.35	0.32	0.37	67.6%
Luxembourg	0.11	0.15	0.19	0.22	0.39	0.57	0.96	1.29	1.29	1.37	1.53	289.8%
Netherlands	2.03	2.29	2.75	3.50	4.55	7.52	9.77	10.79	10.09	11.32	11.54	153.4%
Norway	0.70	0.51	0.68	0.93	1.26	1.10	1.06	1.05	1.32	1.79	1.54	22.7%
Poland	0.53	0.53	0.68	0.68	0.66	0.81	0.82	0.96	1.52	1.94	2.04	209.3%
Portugal	0.71	0.81	0.89	1.28	1.38	1.56	1.94	2.18	2.63	3.13	3.44	149.8%
Slovak Republic	-	-	-	-	-	0.12	0.08	0.12	0.12	0.13	0.15	x
Slovenia	..	..	..	..	0.08	0.06	0.07	0.07	0.08	0.08	0.06	-19.2%
Spain	1.76	2.80	2.60	2.69	3.35	6.07	8.11	9.28	9.11	11.55	12.25	265.2%
Sweden	0.33	0.34	0.49	0.51	1.09	1.77	2.08	1.89	2.06	2.21	2.46	126.6%
Switzerland	1.64	1.81	2.04	2.44	3.03	3.66	4.61	3.52	4.20	4.86	5.08	67.6%
Turkey	0.09	0.14	0.12	0.18	0.54	0.79	1.56	3.25	3.64	10.67	10.25	+
United Kingdom	7.15	7.39	8.68	9.63	19.05	22.14	31.24	36.01	32.13	32.44	32.71	71.8%
OECD Europe ¹	37.79	39.51	45.16	51.03	74.16	90.99	120.64	134.72	134.86	151.16	155.68	109.9%
<i>IEA/Accession/Association</i>	67.85	75.55	93.25	108.01	166.24	206.57	262.48	310.38	325.37	375.92	392.59	136.2%
<i>European Union - 28</i>	..	..	..	..	72.35	88.16	115.09	128.95	127.83	135.99	141.14	95.1%
<i>G20</i>	..	..	..	..	184.43	211.93	260.15	311.71	327.34	370.09	384.67	108.6%
<i>Africa</i>	5.44	7.76	10.82	11.40	11.75	13.60	17.91	17.93	20.30	21.53	22.51	91.5%
<i>Americas</i>	23.24	25.68	33.78	34.62	56.51	68.87	85.89	99.88	101.19	115.09	117.71	108.3%
<i>Asia</i>	31.35	34.07	35.70	44.38	74.80	92.83	107.23	143.71	169.95	221.52	238.11	218.3%
<i>Europe</i>	38.57	40.25	46.20	52.14	109.71	107.29	134.93	150.02	152.72	158.89	163.96	49.4%
<i>Oceania</i>	2.62	2.51	3.29	3.89	6.17	7.73	9.63	11.19	13.39	14.75	15.45	150.4%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions from international aviation bunkersmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Non-OECD Total	104.93	105.00	120.73	131.85	115.44	114.42	132.03	164.41	200.84	245.67	260.99	126.1%
Albania	-	-	-	-	-	-	0.12	0.18	0.05	0.01	0.02	x
Armenia	..	..	..	..	0.60	0.10	0.19	0.14	0.13	0.10	0.14	-77.3%
Azerbaijan	..	..	..	..	1.05	0.31	0.30	1.11	1.21	0.81	0.54	-48.5%
Belarus	..	..	..	..	-	-	-	-	-	0.34	0.37	x
Bosnia and Herzegovina	..	..	..	..	0.08	0.11	0.03	0.02	0.02	0.02	0.03	-60.0%
Bulgaria	0.61	0.61	0.92	1.13	0.71	0.99	0.24	0.56	0.50	0.53	0.64	-10.8%
Croatia	..	..	..	..	0.49	0.24	0.20	0.25	0.29	0.34	0.36	-25.3%
Cyprus ¹	0.15	0.02	0.23	0.44	0.73	0.80	0.82	0.89	0.83	0.72	0.81	11.4%
FYR of Macedonia	..	..	..	..	0.02	0.09	0.09	0.02	0.02	0.04	0.05	200.0%
Georgia	..	..	..	..	0.61	0.01	0.05	0.11	0.12	0.21	0.22	-64.0%
Gibraltar	0.02	0.02	0.01	0.01	0.02	0.01	0.01	0.02	0.02	0.02	0.02	14.3%
Kazakhstan	..	..	..	..	2.70	0.79	0.23	0.49	0.62	0.95	0.94	-65.1%
Kosovo	..	..	..	..	..	..	-	-	0.04	0.01	0.01	..
Kyrgyzstan	..	..	..	..	0.26	0.19	0.12	0.39	0.83	0.32	0.32	19.8%
Lithuania	..	..	..	..	0.40	0.12	0.07	0.14	0.14	0.24	0.29	-29.0%
Malta	0.18	0.18	0.23	0.14	0.22	0.22	0.37	0.26	0.30	0.34	0.37	72.9%
Republic of Moldova	..	..	..	..	0.22	0.03	0.06	0.04	0.06	0.07	0.10	-55.6%
Montenegro	..	..	..	..	..	..	..	0.04	0.01	0.06	0.06	..
Romania	0.06	0.05	-	-	0.70	0.55	0.38	0.33	0.43	0.63	0.76	9.3%
Russian Federation	..	..	..	..	26.63	14.13	13.40	15.43	18.67	15.17	14.61	-45.1%
Serbia	..	..	..	..	0.43	0.11	0.09	0.15	0.13	0.19	0.35	-17.9%
Tajikistan	..	..	..	..	0.05	0.02	0.01	0.03	0.09	0.14	0.10	113.3%
Turkmenistan	..	..	..	..	0.76	0.62	0.98	1.35	1.63	1.45	1.45	90.3%
Ukraine	..	..	..	..	6.18	0.48	0.78	1.12	0.83	0.37	0.48	-92.2%
Uzbekistan	..	..	..	..	-	-	-	-	-	-	-	-
Former Soviet Union	67.33	62.72	71.33	77.48	..	..	..	..	..	..	..	..
Former Yugoslavia	0.65	0.89	1.01	1.00	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia	69.00	64.50	73.74	80.20	42.83	19.93	18.55	23.07	26.96	23.08	23.03	-46.2%
Algeria	0.29	0.67	0.94	1.32	1.10	0.97	1.18	1.17	1.44	1.45	1.47	33.3%
Angola	0.23	0.31	0.26	1.00	1.04	1.18	1.43	0.57	0.64	0.68	0.50	-51.8%
Benin	0.02	0.01	0.03	0.06	0.05	0.07	0.07	0.03	0.47	-	-	-100.0%
Botswana	..	..	..	0.01	0.04	0.02	0.02	0.03	0.04	0.04	0.04	-
Cameroon	0.17	0.10	0.15	0.15	0.15	0.17	0.18	0.20	0.21	0.31	0.32	110.4%
Congo	-	0.05	0.11	0.09	0.08	0.05	0.08	0.11	0.14	0.13	0.13	70.8%
Côte d'Ivoire	0.13	0.21	0.26	0.29	0.27	0.26	0.37	0.28	0.18	0.40	0.51	89.3%
Dem. Rep. of the Congo	0.28	0.25	0.38	0.40	0.32	0.35	0.24	0.51	0.47	0.39	0.37	12.9%
Egypt	0.21	0.28	0.52	0.13	0.46	0.82	1.77	2.31	2.64	1.65	1.72	277.1%
Eritrea	..	..	..	..	..	0.02	0.03	0.03	0.00	0.00	0.00	..
Ethiopia	0.14	0.16	0.20	0.34	0.54	0.17	0.21	0.40	0.87	1.31	1.41	163.2%
Gabon	0.03	0.04	0.07	0.09	0.20	0.20	0.24	0.21	0.25	0.20	0.21	4.6%
Ghana	0.13	0.15	0.12	0.10	0.14	0.18	0.33	0.40	0.36	0.38	0.45	218.4%
Kenya	0.58	0.90	1.11	0.83	0.84	1.38	1.38	1.78	1.72	2.02	1.97	135.4%
Libya	0.27	0.54	0.90	1.06	0.64	0.92	1.34	0.54	0.62	0.20	0.20	-68.5%
Mauritius	0.06	0.10	0.14	0.18	0.21	0.21	0.61	0.73	0.73	0.82	0.92	331.3%
Morocco	0.35	0.44	0.78	0.70	0.79	0.74	0.91	1.17	1.79	2.05	2.05	157.8%
Mozambique	0.12	0.05	0.08	0.10	0.13	0.06	0.13	0.14	0.20	0.11	0.15	14.6%
Namibia	..	..	..	..	..	0.10	0.13	0.03	0.10	0.12	0.12	..
Niger	..	..	..	..	..	..	0.05	0.04	0.04	0.13	0.14	..
Nigeria	0.25	0.71	1.15	1.35	0.96	1.26	0.59	0.71	0.52	1.08	1.35	40.4%
Senegal	0.30	0.37	0.59	0.43	0.46	0.46	0.76	0.75	0.69	0.87	0.67	46.5%
South Africa	0.53	0.74	0.88	0.94	1.11	1.59	2.82	2.18	2.43	2.58	2.84	157.3%
South Sudan	..	..	..	..	..	..	..	..	..	0.18	0.19	..
Sudan	0.34	0.15	0.20	0.22	0.10	0.11	0.33	0.98	0.85	0.72	0.90	841.0%
United Rep. of Tanzania	0.09	0.20	0.18	0.13	0.22	0.19	0.18	0.26	0.34	0.47	0.50	126.0%
Togo	-	-	-	-	0.11	0.12	0.04	0.15	0.22	0.26	0.27	157.6%
Tunisia	0.39	0.38	0.57	0.31	0.57	0.75	0.86	0.66	0.76	0.63	0.67	16.1%
Zambia	0.04	0.14	0.23	0.12	0.20	0.10	0.13	0.17	0.09	0.12	0.12	-39.7%
Zimbabwe	0.09	0.19	0.21	0.33	0.25	0.35	0.36	0.03	0.03	0.08	0.14	-45.6%
Other Africa	0.40	0.64	0.74	0.72	0.79	0.81	1.17	1.36	1.48	2.14	2.17	175.3%
Africa	5.44	7.76	10.82	11.40	11.75	13.60	17.91	17.93	20.30	21.53	22.51	91.5%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions from international aviation bunkersmillion tonnes of CO₂

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Bangladesh	0.06	0.09	0.15	0.22	0.27	0.30	0.38	0.81	0.92	1.08	1.11	303.5%
Brunei Darussalam	0.00	0.06	0.07	0.05	0.11	0.21	0.21	0.25	0.33	0.26	0.24	105.6%
Cambodia	..	..	..	..	..	0.03	0.04	0.06	0.13	0.28	0.26	..
DPR of Korea	-	-	-	-	-	-	-	-	-	-	-	-
India	1.69	2.00	2.51	3.24	3.74	4.65	5.02	7.36	11.34	13.98	15.62	317.3%
Indonesia	0.17	0.33	0.73	0.66	0.97	1.16	1.21	1.53	2.02	2.65	2.78	185.9%
Malaysia	0.42	0.75	0.76	0.86	1.51	2.78	3.77	4.81	5.70	7.51	7.23	379.2%
Mongolia	..	..	..	-	0.01	0.06	0.06	0.06	0.05	0.09	0.08	525.0%
Myanmar	0.03	0.02	0.03	0.03	0.02	0.02	0.05	0.03	0.06	0.14	0.28	+
Nepal	0.01	0.02	0.04	0.06	0.05	0.11	0.17	0.19	0.26	0.21	0.43	753.3%
Pakistan	1.14	1.09	1.71	1.42	1.41	1.72	1.98	2.46	2.28	2.24	2.37	68.1%
Philippines	0.71	0.83	0.66	1.03	1.02	1.17	1.43	2.14	2.96	3.64	3.88	281.5%
Singapore	0.70	1.33	2.73	3.23	5.69	7.89	12.01	13.59	17.19	22.09	23.39	311.2%
Sri Lanka	-	0.00	0.00	-	-	-	0.32	0.94	0.35	1.17	1.64	x
Chinese Taipei	1.49	1.64	1.67	0.92	1.81	4.13	5.42	6.51	6.30	8.14	8.75	383.3%
Thailand	1.27	2.19	2.41	3.16	5.64	7.59	8.35	10.27	10.00	11.84	12.57	122.8%
Viet Nam	6.98	2.63	-	-	-	0.12	0.30	0.95	2.03	2.90	4.32	x
Other non-OECD Asia	0.40	0.28	0.33	0.47	0.52	0.33	0.62	0.84	0.91	0.84	0.85	63.8%
Asia (excl. China)	15.07	13.26	13.83	15.35	22.78	32.28	41.34	52.80	62.82	79.04	85.80	276.6%
People's Rep. of China	-	-	0.10	0.85	1.30	2.22	4.22	10.07	15.56	23.35	25.79	+
Hong Kong, China	1.43	1.85	2.27	2.58	5.68	9.31	8.39	14.86	16.35	19.17	19.55	244.3%
China	1.43	1.85	2.37	3.43	6.98	11.53	12.61	24.93	31.91	42.52	45.34	549.2%
Argentina	-	-	-	-	-	1.59	2.86	2.17	1.87	2.81	2.91	x
Bolivia	-	-	-	-	-	-	0.14	0.15	0.14	0.19	0.20	x
Brazil	-	-	0.61	0.75	1.43	2.08	2.02	3.34	5.83	7.28	6.76	373.3%
Colombia	0.60	0.93	1.32	1.32	1.58	2.17	1.91	1.85	2.36	4.03	4.05	156.9%
Costa Rica	-	-	-	-	0.01	0.32	0.37	0.57	0.50	0.53	0.60	+
Cuba	0.27	0.44	0.66	0.90	0.99	0.54	0.65	0.54	0.44	0.31	0.29	-71.0%
Curacao ¹	0.16	0.13	0.17	0.13	0.12	0.20	0.24	0.26	0.28	0.19	0.19	62.1%
Dominican Republic	0.08	0.10	0.17	0.17	0.11	0.18	1.17	1.32	1.30	1.53	1.58	+
Ecuador	0.27	0.14	0.45	0.45	0.39	0.55	0.49	0.97	1.04	1.08	1.02	161.0%
El Salvador	0.04	0.05	0.06	0.11	0.11	0.16	0.22	0.24	0.34	0.48	0.53	363.9%
Guatemala	0.15	0.11	0.13	0.12	0.13	0.14	0.15	0.23	0.20	0.19	0.19	49.0%
Haiti	0.02	0.03	0.05	0.04	0.07	0.07	0.09	0.07	0.06	0.07	0.07	-4.3%
Honduras	0.02	0.03	0.06	0.12	0.09	0.07	0.11	0.07	0.15	0.25	0.19	103.5%
Jamaica	0.42	0.33	0.30	0.40	0.47	0.53	0.54	0.61	0.59	0.59	0.60	28.6%
Nicaragua	0.05	0.06	0.06	0.04	0.08	0.06	0.08	0.05	0.06	0.07	0.07	-15.2%
Panama	0.44	1.12	0.42	0.26	0.20	0.32	0.55	0.57	1.08	2.04	2.16	957.8%
Paraguay	0.03	0.04	0.06	0.06	0.03	0.03	0.04	0.05	0.07	0.10	0.12	319.7%
Peru	0.52	0.75	0.92	0.72	0.65	1.11	1.07	0.97	1.95	2.61	2.90	345.6%
Suriname	..	..	..	..	..	..	-	-	-	-	-	..
Trinidad and Tobago	0.21	0.12	0.17	0.22	0.20	0.18	0.33	1.21	0.85	0.76	0.99	398.4%
Uruguay	-	-	-	-	-	-	0.12	0.12	0.23	0.29	0.30	x
Venezuela	0.33	0.32	1.03	0.81	1.03	1.01	0.95	2.05	1.90	2.18	1.54	48.7%
Other non-OECD Americas	1.01	0.50	0.91	0.87	1.03	1.07	1.81	1.40	1.53	1.94	1.97	92.3%
Non-OECD Americas	4.63	5.20	7.56	7.50	8.73	12.37	15.90	18.80	22.77	29.53	29.23	234.7%
Bahrain	0.43	0.85	1.55	1.22	1.44	1.16	1.13	1.74	1.97	1.36	1.36	-6.0%
Islamic Republic of Iran	7.10	7.08	2.17	1.66	1.50	1.99	2.73	2.71	3.84	4.15	4.66	210.9%
Iraq	0.24	0.82	1.06	0.59	0.99	1.28	1.64	2.00	2.52	1.68	2.10	112.0%
Jordan	0.12	0.18	0.57	0.62	0.67	0.76	0.75	0.98	1.09	0.91	1.16	73.5%
Kuwait	0.35	0.35	1.06	0.98	0.52	1.14	1.16	1.84	2.26	2.31	2.90	461.2%
Lebanon	0.29	0.24	0.15	0.32	0.16	0.66	0.40	0.47	0.71	0.74	0.75	372.0%
Oman	0.01	0.15	0.38	0.58	0.94	0.47	0.65	0.69	1.30	1.61	1.64	73.6%
Qatar	-	0.16	0.23	0.24	0.35	0.43	0.57	1.45	3.61	3.86	5.48	+
Saudi Arabia	0.48	1.42	3.49	4.61	4.84	5.74	5.91	5.50	6.23	8.41	8.59	77.5%
Syrian Arab Republic	0.24	0.66	0.72	0.88	0.88	0.63	0.42	0.33	0.10	0.05	0.05	-94.2%
United Arab Emirates	0.02	0.34	0.81	1.82	9.89	10.19	9.97	8.81	12.07	24.85	26.37	166.6%
Yemen	0.09	0.18	0.22	0.47	0.18	0.28	0.38	0.36	0.37	0.04	0.02	-89.1%
Middle East	9.36	12.43	12.42	13.98	22.36	24.72	25.72	26.87	36.06	49.97	55.08	146.4%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions by sector in 2016 ¹million tonnes of CO₂

	Total CO ₂ emissions from fuel combustion	Electricity and heat production	Other energy ind. own use ²	Manufacturing industries and construction	Transport	of which: road	Residential	Commercial and public services
World ³	32 314.2	13 412.4	1 592.9	6 109.3	7 866.0	5 852.6	1 883.9	836.8
<i>Annex I Parties</i>	12 239.8	4 930.3	702.3	1 417.9	3 496.0	3 006.9	975.5	531.4
<i>Annex II Parties</i>	9 563.6	3 591.3	589.5	1 061.2	3 000.6	2 621.4	712.5	467.9
<i>North America</i>	5 373.8	1 994.9	364.1	497.7	1 883.6	1 584.8	318.3	251.5
<i>Europe</i>	2 619.8	824.6	145.2	327.9	798.8	756.3	329.1	145.1
<i>Asia Oceania</i>	1 569.9	771.9	80.2	235.6	318.2	280.4	65.1	71.2
<i>Annex I EIT</i>	2 329.9	1 205.2	96.3	305.0	413.8	310.0	231.0	40.8
<i>Non-Annex I Parties</i>	18 834.3	8 482.1	890.6	4 691.4	3 130.0	2 845.7	908.4	305.4
<i>Annex B Kyoto Parties</i>	4 141.0	1 542.9	269.0	539.8	1 086.1	1 017.6	440.9	180.2
Non-OECD Total	19 482.7	8 916.2	870.4	4 786.5	3 143.8	2 771.3	1 029.7	304.2
OECD Total	11 591.4	4 496.2	722.5	1 322.8	3 482.1	3 081.3	854.2	532.6
Canada	540.8	101.2	112.2	64.0	172.4	137.6	36.5	36.9
Chile	85.3	35.1	2.0	15.0	26.4	23.8	3.8	2.1
Mexico	445.5	148.8	47.3	61.9	155.9	151.0	17.1	4.7
United States	4 833.1	1 893.7	251.9	433.6	1 711.2	1 447.1	281.8	214.7
OECD Americas	5 904.6	2 178.7	413.4	574.6	2 065.9	1 759.6	339.2	258.4
Australia	392.4	194.5	41.1	38.7	96.1	80.5	9.3	5.4
Israel ⁴	63.7	37.9	2.2	4.3	17.6	17.5	0.4	0.4
Japan	1 147.1	572.8	37.4	190.3	207.5	186.5	55.3	64.9
Korea	589.2	310.2	46.4	73.0	101.3	95.8	33.6	17.8
New Zealand	30.5	4.5	1.7	6.6	14.6	13.3	0.6	1.0
OECD Asia Oceania	2 222.9	1 120.0	128.8	312.9	437.1	393.7	99.1	89.4
Austria	62.9	13.5	5.9	11.5	23.5	22.7	6.1	1.6
Belgium	91.6	16.2	6.0	19.2	26.0	25.2	15.7	6.8
Czech Republic	101.4	55.2	4.0	11.7	18.0	17.6	8.2	3.0
Denmark	33.5	11.8	2.0	3.5	11.8	10.9	2.2	0.6
Estonia	16.4	12.4	0.2	0.6	2.4	2.3	0.2	0.3
Finland	45.5	18.3	3.3	7.5	12.4	11.7	1.1	0.9
France	292.9	36.8	14.4	37.6	121.9	117.7	45.9	23.8
Germany	731.6	321.8	24.1	89.2	161.0	155.8	89.1	46.0
Greece	63.1	28.5	4.5	6.5	17.2	14.7	4.7	0.9
Hungary	43.9	11.9	1.5	6.4	12.2	12.0	7.3	3.1
Iceland	2.1	0.0	-	0.6	0.9	0.9	0.0	-
Ireland	36.9	12.5	0.4	4.0	11.9	11.5	5.8	1.8
Italy	325.7	108.2	9.9	34.7	101.7	96.0	46.7	16.9
Latvia	6.8	1.9	-	0.6	3.1	2.9	0.4	0.4
Luxembourg	8.5	0.3	-	1.0	5.6	5.6	1.0	0.6
Netherlands	157.1	60.7	10.3	23.9	30.1	29.0	16.8	8.1
Norway	35.5	1.8	11.8	6.0	13.3	9.3	1.0	0.8
Poland	293.1	150.0	7.8	28.1	53.3	52.1	35.9	8.5
Portugal	47.4	18.1	3.9	5.3	16.1	15.3	1.7	1.0
Slovak Republic	30.2	6.6	5.2	7.3	6.8	6.3	2.7	1.5
Slovenia	13.6	4.9	0.0	1.6	5.6	5.6	0.7	0.4
Spain	238.6	66.7	19.8	29.5	88.8	80.4	16.5	10.9
Sweden	38.0	7.1	2.8	6.4	20.0	19.3	0.1	1.3
Switzerland	37.9	2.7	0.4	5.2	16.0	15.8	8.7	4.3
Turkey	338.8	130.0	16.5	51.1	79.0	73.0	31.5	22.5
United Kingdom	371.1	99.4	25.8	36.4	120.5	114.5	65.8	18.9
OECD Europe ⁴	3 464.0	1 197.5	180.4	435.3	979.1	928.1	416.0	184.8
<i>IEA/Accession/Association</i>	24 301.1	10 415.0	1 168.0	4 992.7	5 145.3	4 537.9	1 378.2	719.6
<i>European Union - 28</i>	3 192.3	1 123.2	158.9	391.7	909.4	867.2	384.4	160.6
<i>G20</i>	26 099.8	11 497.9	1 242.6	5 236.7	5 361.3	4 662.6	1 530.4	736.9
<i>Africa</i>	1 157.6	472.1	83.3	141.1	349.9	335.6	72.9	12.2
<i>Americas</i>	7 003.4	2 440.3	508.9	770.7	2 489.4	2 156.0	403.3	270.7
<i>Asia</i>	17 426.7	8 202.7	714.9	4 506.3	2 440.5	2 179.1	834.0	358.9
<i>Europe</i>	5 048.6	2 091.4	243.0	642.7	1 231.5	1 084.9	563.4	188.6
<i>Oceania</i>	437.8	206.0	42.8	48.6	114.7	97.0	10.2	6.4

1. This table shows CO₂ emissions for the same sectors which are present throughout this publication. In particular, the emissions from electricity and heat production are shown separately and not reallocated. 2. Includes emissions from own use in petroleum refining, the manufacture of solid fuels, coal mining, oil and gas extraction and other energy-producing industries. 3. World includes international bunkers in the transport sector. 4. Please refer to the chapter Geographical coverage.

CO₂ emissions by sector in 2016million tonnes of CO₂

	Total CO ₂ emissions from fuel combustion	Electricity and heat production	Other energy ind. own use	Manufacturing industries and construction	Transport	of which: road	Residential	Commercial and public services
Non-OECD Total	19 482.7	8 916.2	870.4	4 786.5	3 143.8	2 771.3	1 029.7	304.2
Albania	3.7	-	0.1	0.6	2.3	2.2	0.2	0.1
Armenia	4.9	1.2	-	0.4	1.6	1.6	1.1	0.3
Azerbaijan	31.4	12.4	1.9	2.8	6.5	5.7	6.3	0.4
Belarus	53.1	27.6	3.3	4.5	10.8	9.1	4.5	0.4
Bosnia and Herzegovina	22.0	14.2	0.7	2.0	3.6	3.6	0.6	0.7
Bulgaria	40.5	24.9	1.2	3.7	9.1	8.7	0.8	0.3
Croatia	15.9	3.6	1.3	2.2	6.1	5.8	1.5	0.6
Cyprus ¹	6.3	3.2	-	0.6	1.9	1.9	0.4	0.1
FYR of Macedonia	6.9	3.6	0.0	1.0	2.0	2.0	0.0	0.2
Georgia	8.8	1.1	0.0	1.5	4.1	4.1	1.6	0.4
Gibraltar	0.6	0.2	-	-	0.5	0.5	-	-
Kazakhstan	230.0	91.6	49.7	55.4	15.1	14.1	9.8	6.4
Kosovo	9.1	6.7	-	0.6	1.2	1.2	0.1	0.4
Kyrgyzstan	9.3	1.9	0.0	0.9	3.3	3.3	2.2	0.6
Lithuania	10.8	1.4	1.6	1.1	5.4	5.2	0.7	0.3
Malta	1.4	0.6	-	0.0	0.6	0.5	0.0	0.1
Republic of Moldova	7.7	3.6	-	0.8	2.0	2.0	0.8	0.3
Montenegro	2.1	1.2	-	0.2	0.7	0.7	0.0	0.0
Romania	67.9	26.7	3.2	11.7	16.5	15.9	6.3	2.1
Russian Federation	1 438.6	776.8	63.3	187.8	240.2	145.8	138.6	17.7
Serbia	45.5	31.5	0.7	4.5	6.0	5.9	1.5	0.9
Tajikistan	4.8	0.5	-	0.1	1.3	1.3	-	-
Turkmenistan	69.0	20.7	5.2	2.4	11.8	7.9	0.5	16.8
Ukraine	197.7	101.4	3.8	37.6	24.4	20.6	23.2	2.3
Uzbekistan	85.3	36.5	2.5	11.1	5.7	3.2	22.3	4.4
Non-OECD Europe and Eurasia¹	2 373.0	1 193.1	138.5	333.6	382.7	272.8	223.2	55.7
Algeria	127.6	36.2	11.6	10.9	45.1	42.8	20.7	-
Angola	19.6	4.0	0.4	2.5	8.4	7.7	1.6	2.7
Benin	5.7	0.2	-	0.6	4.8	4.8	0.1	0.0
Botswana	7.0	3.6	-	0.7	2.5	2.4	0.0	0.1
Cameroon	6.1	2.1	0.1	0.2	3.2	3.2	0.5	-
Congo	2.6	0.5	-	0.1	2.0	1.6	0.1	-
Côte d'Ivoire	10.3	3.8	0.2	1.6	3.6	3.2	0.5	0.3
Dem. Rep. of the Congo	2.0	0.0	-	0.1	1.9	1.6	0.0	-
Egypt	204.8	89.3	11.1	28.6	56.0	53.2	16.7	-
Eritrea	0.6	0.4	-	0.0	0.2	0.2	0.1	0.0
Ethiopia	10.9	0.0	-	3.7	5.3	5.0	0.9	0.2
Gabon	3.4	1.0	0.0	1.2	0.8	0.8	0.2	0.1
Ghana	12.8	2.6	0.1	1.7	7.3	6.7	0.8	0.1
Kenya	15.7	1.8	0.1	3.5	8.9	8.7	1.2	-
Libya	43.3	18.8	0.5	1.7	21.2	21.2	1.2	-
Mauritius	4.0	2.4	-	0.3	1.1	1.0	0.1	0.0
Morocco	55.3	21.6	-	7.1	17.1	17.0	6.5	0.4
Mozambique	7.2	1.3	0.0	0.7	3.9	3.7	0.1	0.1
Namibia	4.1	0.1	-	0.3	2.2	2.1	0.0	0.0
Niger	1.9	0.5	-	0.2	1.2	1.2	0.0	0.0
Nigeria	86.0	12.8	13.3	6.7	50.8	50.4	1.7	0.0
Senegal	8.2	3.0	0.1	1.7	3.0	2.8	0.4	0.0
South Africa	414.4	235.8	44.1	50.3	55.4	51.5	14.4	6.8
South Sudan	1.8	0.5	0.2	0.0	1.0	0.9	0.0	-
Sudan	18.9	6.1	0.2	1.6	9.5	9.4	0.6	0.4
United Rep. of Tanzania	10.6	1.8	-	1.3	7.0	7.0	0.5	-
Togo	2.0	0.0	-	0.2	1.5	1.5	0.2	-
Tunisia	25.2	8.6	0.5	5.1	7.1	6.5	2.0	0.7
Zambia	3.6	0.6	0.0	1.5	1.2	1.1	0.0	0.1
Zimbabwe	10.3	6.1	0.1	1.1	2.1	2.0	0.2	0.0
Other Africa	31.8	6.9	0.8	5.8	15.0	14.2	1.6	0.2
Africa	1 157.6	472.1	83.3	141.1	349.9	335.6	72.9	12.2

1. Please refer to the chapter Geographical coverage.

CO₂ emissions by sector in 2016million tonnes of CO₂

	Total CO ₂ emissions from fuel combustion	Electricity and heat production	Other energy ind. own use	Manufacturing industries and construction	Transport	of which: road	Residential	Commercial and public services
Bangladesh	73.3	36.1	0.1	15.1	9.8	7.5	8.5	0.5
Brunei Darussalam	6.3	2.6	1.9	0.3	1.3	1.3	0.1	-
Cambodia	9.3	3.0	-	0.7	5.0	4.2	0.1	0.3
DPR of Korea	25.4	4.1	0.0	15.1	1.4	1.4	0.1	-
India	2 076.8	1 072.5	38.9	533.8	265.3	246.8	84.7	24.5
Indonesia	454.9	181.3	25.3	84.2	134.5	117.9	20.4	2.7
Malaysia	216.2	102.6	15.9	29.6	62.8	60.9	1.6	2.5
Mongolia	18.0	11.7	0.0	1.4	1.7	1.3	1.6	-
Myanmar	21.1	6.3	1.1	4.0	4.4	3.1	0.0	0.9
Nepal	8.5	-	-	2.8	3.9	3.9	0.7	0.5
Pakistan	153.4	44.7	1.5	41.8	46.2	44.9	15.0	3.7
Philippines	114.8	55.1	1.0	16.8	33.3	28.9	3.0	4.9
Singapore	45.3	20.3	5.4	12.4	6.5	6.3	0.2	0.4
Sri Lanka	20.9	8.7	0.0	1.6	9.4	9.0	0.6	0.2
Chinese Taipei	257.8	153.1	14.6	42.6	37.7	36.9	4.4	3.8
Thailand	244.6	91.3	18.8	49.5	69.2	65.5	4.4	2.1
Viet Nam	187.1	73.9	-	62.4	36.9	35.7	7.8	4.5
Other non-OECD Asia	51.4	27.9	0.0	7.1	13.1	11.1	0.5	0.0
Asia (excl. China)	3 985.0	1 895.2	124.5	921.4	742.6	686.8	153.9	51.6
People's Rep. of China	9 056.8	4 358.3	285.8	2 842.4	843.5	697.9	374.1	151.0
Hong Kong, China	44.7	28.1	-	7.3	7.7	7.7	0.8	0.8
China	9 101.5	4 386.4	285.8	2 849.7	851.2	705.6	374.9	151.8
Argentina	190.6	55.2	18.6	30.0	46.5	41.2	25.0	3.8
Bolivia	20.2	4.5	1.1	2.1	8.2	7.8	1.5	0.1
Brazil	416.7	69.5	26.3	85.7	198.5	181.0	18.2	2.2
Colombia	85.9	16.9	11.0	14.7	31.5	31.4	3.7	1.0
Costa Rica	7.5	0.1	0.0	1.1	5.7	5.7	0.2	0.1
Cuba	23.3	11.1	0.5	6.5	1.5	1.5	0.6	0.0
Curaçao ¹	4.1	0.5	2.1	0.4	1.1	1.1	0.1	-
Dominican Republic	22.4	11.6	0.1	3.0	5.9	4.5	1.3	0.2
Ecuador	35.0	7.6	1.5	3.2	16.7	15.9	2.4	1.1
El Salvador	6.8	1.6	-	1.0	3.5	3.5	0.6	0.1
Guatemala	16.3	5.1	0.1	2.0	8.0	8.0	0.9	0.0
Haiti	3.3	1.0	-	0.6	1.4	1.4	0.3	0.0
Honduras	9.1	3.4	-	1.3	4.1	3.9	0.3	-
Jamaica	7.2	2.8	-	2.4	1.8	1.8	0.1	0.2
Nicaragua	5.3	1.6	0.0	0.7	2.4	2.1	0.2	0.5
Panama	10.2	2.6	-	2.1	4.7	4.7	0.6	0.2
Paraguay	6.4	0.0	-	0.2	6.0	6.0	0.2	-
Peru	51.3	13.7	3.9	7.8	22.3	22.1	2.6	0.7
Suriname	1.9	0.9	0.0	0.1	0.6	0.4	0.0	0.0
Trinidad and Tobago	21.1	5.8	6.9	4.3	3.7	3.4	0.4	0.0
Uruguay	6.3	0.3	0.5	0.8	3.6	3.6	0.5	0.1
Venezuela	127.4	33.9	22.7	25.3	40.0	40.0	4.0	1.4
Other non-OECD Americas	20.6	11.9	0.0	0.8	6.0	5.6	0.6	0.5
Non-OECD Americas	1 098.8	261.6	95.5	196.0	423.5	396.4	64.2	12.2
Bahrain	29.6	20.1	3.5	2.1	3.6	3.5	0.3	-
Islamic Republic of Iran	563.4	153.6	41.5	91.4	130.6	114.8	115.1	19.4
Iraq	139.9	84.5	12.2	8.9	25.3	25.3	9.0	-
Jordan	23.9	9.8	0.6	2.7	8.3	8.3	1.5	0.4
Kuwait	90.2	43.5	13.9	17.6	14.2	14.2	0.9	-
Lebanon	23.2	13.2	-	1.1	5.7	5.7	3.2	-
Oman	63.1	16.1	7.7	23.8	12.3	12.3	0.6	-
Qatar	79.1	20.6	31.3	13.6	13.2	13.2	0.4	-
Saudi Arabia	527.2	246.1	28.6	110.8	136.9	134.0	4.9	-
Syrian Arab Republic	26.1	11.5	0.6	3.5	6.4	6.4	2.3	0.6
United Arab Emirates	191.8	85.6	2.6	68.2	34.6	33.6	0.8	-
Yemen	9.2	3.2	0.1	1.0	2.8	2.8	1.8	0.2
Middle East	1 766.7	707.8	142.8	344.7	394.0	374.0	140.7	20.6

1. Please refer to the chapter Geographical coverage.

CO₂ emissions with electricity and heat allocated to consuming sectors ¹ in 2016million tonnes of CO₂

	Total CO ₂ emissions from fuel combustion	Other energy ind. own use ²	Manufacturing industries and construction	Transport	of which: road	Residential	Commercial and public services
World ³	32 314.2	2 142.4	11 789.2	8 046.2	5 884.3	5 362.6	3 246.4
<i>Annex I Parties</i>	12 239.8	947.3	2 909.1	3 569.6	3 009.4	2 509.1	1 942.1
<i>Annex II Parties</i>	9 563.6	707.4	2 072.9	3 037.6	2 623.7	1 846.9	1 618.3
<i>North America</i>	5 373.8	430.2	937.1	1 890.0	1 586.7	1 016.2	924.1
<i>Europe</i>	2 619.8	174.4	636.4	814.0	756.7	560.2	371.8
<i>Asia Oceania</i>	1 569.9	102.9	499.4	333.6	280.4	270.5	322.3
<i>Annex I EIT</i>	2 329.9	221.9	722.1	449.9	310.2	601.6	265.3
<i>Non-Annex I Parties</i>	18 834.3	1 195.0	8 880.1	3 236.4	2 874.9	2 853.5	1 304.4
<i>Annex B Kyoto Parties</i>	4 141.0	352.3	1 088.9	1 116.5	1 018.2	883.3	585.0
Non-OECD Total	19 482.7	1 276.1	9 050.6	3 280.0	2 800.3	3 166.1	1 344.8
OECD Total	11 591.4	866.3	2 738.6	3 526.1	3 084.0	2 196.5	1 901.6
Canada	540.8	118.4	98.6	173.7	137.8	68.9	59.8
Chile	85.3	2.4	36.7	26.9	24.0	10.5	8.0
Mexico	445.5	49.4	141.1	156.5	151.0	49.1	17.8
United States	4 833.1	311.8	838.5	1 716.2	1 448.9	947.3	864.3
OECD Americas	5 904.6	481.9	1 114.9	2 073.3	1 761.8	1 075.8	949.9
Australia	392.4	55.9	104.3	101.4	80.5	59.5	62.5
Israel ⁴	63.7	2.7	14.2	17.6	17.5	12.5	11.9
Japan	1 147.1	45.2	386.9	217.6	186.5	209.0	257.7
Korea	589.2	53.4	230.8	102.7	95.8	80.4	106.5
New Zealand	30.5	1.8	8.2	14.6	13.3	2.0	2.1
OECD Asia Oceania	2 222.9	158.9	744.4	453.9	393.7	363.4	440.8
Austria	62.9	6.3	16.1	24.0	22.7	10.5	5.1
Belgium	91.6	6.5	26.7	26.3	25.2	19.0	10.8
Czech Republic	101.4	6.1	31.5	19.1	17.7	26.1	16.6
Denmark	33.5	2.2	5.2	11.9	10.9	7.9	4.3
Estonia	16.4	0.7	3.0	2.4	2.3	5.3	4.3
Finland	45.5	3.7	15.0	12.5	11.7	7.0	4.9
France	292.9	14.9	47.6	122.7	117.7	59.0	35.4
Germany	731.6	32.3	226.5	166.9	155.9	178.1	127.6
Greece	63.1	5.4	12.3	17.3	14.7	15.2	10.8
Hungary	43.9	1.8	11.2	12.5	12.0	11.2	5.5
Iceland	2.1	0.0	0.6	0.9	0.9	0.0	0.0
Ireland	36.9	0.4	8.9	11.9	11.5	9.7	5.2
Italy	325.7	17.6	78.6	105.1	96.0	69.6	45.5
Latvia	6.8	-	1.0	3.1	2.9	1.3	1.0
Luxembourg	8.5	-	1.1	5.6	5.6	1.1	0.7
Netherlands	157.1	14.0	47.6	30.9	29.2	28.2	25.0
Norway	35.5	11.9	6.7	13.3	9.3	1.5	1.3
Poland	293.1	19.0	69.4	55.6	52.1	87.7	50.5
Portugal	47.4	5.2	11.3	16.3	15.3	6.3	7.0
Slovak Republic	30.2	5.5	9.9	6.9	6.3	4.6	3.1
Slovenia	13.6	0.0	3.9	5.7	5.6	2.1	1.7
Spain	238.6	21.9	51.1	90.3	80.5	35.9	30.9
Sweden	38.0	2.9	8.6	20.1	19.3	3.1	3.0
Switzerland	37.9	0.4	6.1	16.2	15.8	9.7	5.1
Turkey	338.8	18.0	113.1	79.7	73.0	58.8	56.5
United Kingdom	371.1	29.0	66.5	121.9	114.5	98.7	49.3
OECD Europe ⁴	3 464.0	225.5	879.4	998.9	928.5	757.3	510.9
<i>IEA/Accession/Association</i>	24 301.1	1 549.4	9 671.0	5 283.0	4 569.4	3 863.5	2 534.8
<i>European Union - 28</i>	3 192.3	206.6	791.4	929.1	867.7	717.9	465.6
<i>G20</i>	26 099.8	1 749.3	10 246.4	5 529.4	4 693.9	4 381.2	2 777.3
<i>Africa</i>	1 157.6	98.8	340.4	355.2	335.6	216.0	86.3
<i>Americas</i>	7 003.4	582.2	1 412.3	2 497.8	2 158.2	1 223.0	1 022.6
<i>Asia</i>	17 426.7	1 003.8	8 528.7	2 549.9	2 208.1	2 666.2	1 421.8
<i>Europe</i>	5 048.6	399.8	1 385.5	1 283.2	1 085.4	1 195.1	650.9
<i>Oceania</i>	437.8	57.7	120.5	120.1	97.0	63.0	65.5

1. CO₂ emissions from electricity and heat generation have been allocated to final consuming sectors in proportion to the electricity and heat consumed.

2. Includes emissions from own use in petroleum refining, the manufacture of solid fuels, coal mining, oil and gas extraction and other energy-producing industries. 3. World includes international bunkers in the transport sector. 4. Please refer to the chapter Geographical coverage.

CO₂ emissions with electricity and heat allocated to consuming sectors in 2016million tonnes of CO₂

	Total CO ₂ emissions from fuel combustion	Other energy ind. own use	Manufacturing industries and construction	Transport	of which: road	Residential	Commercial and public services
Non-OECD Total	19 482.7	1 276.1	9 050.6	3 280.0	2 800.3	3 166.1	1 344.8
Albania	3.7	0.1	0.6	2.3	2.2	0.2	0.1
Armenia	4.9	-	0.8	1.6	1.6	1.5	0.5
Azerbaijan	31.4	3.7	4.7	6.8	5.7	11.6	3.1
Belarus	53.1	5.6	12.6	11.2	9.2	14.2	6.5
Bosnia and Herzegovina	22.0	1.1	6.5	3.7	3.6	7.1	3.4
Bulgaria	40.5	3.0	11.3	9.3	8.7	9.6	6.6
Croatia	15.9	1.4	3.0	6.1	5.8	3.0	1.7
Cyprus ¹	6.3	0.0	1.0	1.9	1.9	1.5	1.6
FYR of Macedonia	6.9	0.1	1.8	2.0	2.0	1.8	1.1
Georgia	8.8	0.0	1.8	4.1	4.1	1.8	0.7
Gibraltar	0.6	-	-	0.5	0.5	-	0.0
Kazakhstan	230.0	61.4	94.3	17.1	14.2	24.4	21.6
Kosovo	9.1	0.0	2.4	1.2	1.2	3.8	1.5
Kyrgyzstan	9.3	0.0	1.2	3.3	3.3	3.5	0.8
Lithuania	10.8	1.6	1.5	5.4	5.2	1.2	0.7
Malta	1.4	-	0.1	0.6	0.5	0.2	0.4
Republic of Moldova	7.7	0.0	1.7	2.1	2.0	2.5	1.1
Montenegro	2.1	-	0.5	0.7	0.7	0.6	0.4
Romania	67.9	5.4	21.6	16.9	16.0	15.1	6.5
Russian Federation	1 438.6	161.3	469.2	268.3	145.8	364.1	138.2
Serbia	45.5	2.1	13.4	6.3	5.9	17.0	5.8
Tajikistan	4.8	0.0	0.2	1.3	1.3	0.2	0.0
Turkmenistan	69.0	7.9	7.7	12.2	7.9	3.6	16.8
Ukraine	197.7	10.5	73.0	27.4	20.6	56.2	22.4
Uzbekistan	85.3	3.2	19.0	6.3	3.2	26.0	6.0
Non-OECD Europe and Eurasia¹	2 373.0	268.6	750.0	418.6	273.0	570.8	247.8
Algeria	127.6	12.0	23.6	45.7	42.8	34.5	-
Angola	19.6	0.4	3.8	8.4	7.7	4.2	2.7
Benin	5.7	-	0.7	4.8	4.8	0.2	0.1
Botswana	7.0	-	2.2	2.5	2.4	1.0	0.9
Cameroon	6.1	0.1	1.4	3.2	3.2	0.9	0.2
Congo	2.6	-	0.3	2.0	1.6	0.3	-
Côte d'Ivoire	10.3	0.2	2.8	3.6	3.2	1.7	1.7
Dem. Rep. of the Congo	2.0	-	0.1	1.9	1.6	0.0	0.0
Egypt	204.8	11.1	50.8	56.3	53.2	57.9	21.6
Eritrea	0.6	-	0.1	0.2	0.2	0.2	0.1
Ethiopia	10.9	-	3.7	5.3	5.0	0.9	0.2
Gabon	3.4	0.1	1.4	0.8	0.8	0.7	0.3
Ghana	12.8	0.1	2.8	7.3	6.7	1.8	0.5
Kenya	15.7	0.1	4.4	8.9	8.7	1.8	0.3
Libya	43.3	0.5	3.3	21.2	21.2	9.1	2.0
Mauritius	4.0	0.0	1.1	1.1	1.0	0.9	0.8
Morocco	55.3	-	14.9	17.3	17.0	13.8	4.0
Mozambique	7.2	0.0	1.7	3.9	3.7	0.3	0.2
Namibia	4.1	-	0.4	2.2	2.1	0.0	0.0
Niger	1.9	0.0	0.3	1.2	1.2	0.3	0.1
Nigeria	86.0	13.4	8.7	50.8	50.4	9.1	3.2
Senegal	8.2	0.1	2.6	3.0	2.8	1.3	0.8
South Africa	414.4	58.7	183.3	59.4	51.5	58.5	38.8
South Sudan	1.8	0.2	0.0	1.0	0.9	0.2	0.2
Sudan	18.9	0.2	2.5	9.5	9.4	3.8	2.0
United Rep. of Tanzania	10.6	0.0	1.8	7.0	7.0	1.3	0.4
Togo	2.0	-	0.2	1.5	1.5	0.2	0.0
Tunisia	25.2	0.8	8.1	7.1	6.5	4.5	2.9
Zambia	3.6	0.0	1.9	1.2	1.1	0.2	0.1
Zimbabwe	10.3	0.1	3.3	2.1	2.0	2.5	1.1
Other Africa	31.8	0.8	8.2	15.0	14.2	3.9	1.2
Africa	1 157.6	98.8	340.4	355.2	335.6	216.0	86.3

1. Please refer to the chapter Geographical coverage.

CO₂ emissions with electricity and heat allocated to consuming sectors in 2016million tonnes of CO₂

	Total CO ₂ emissions from fuel combustion	Other energy ind. own use	Manufacturing industries and construction	Transport	of which: road	Residential	Commercial and public services
Bangladesh	73.3	0.1	35.2	9.8	7.5	20.7	2.9
Brunei Darussalam	6.3	2.2	0.4	1.3	1.3	1.1	1.2
Cambodia	9.3	-	1.4	5.0	4.2	1.1	1.6
DPR of Korea	25.4	0.0	17.2	1.4	1.4	0.1	-
India	2 076.8	43.6	940.4	281.9	246.8	347.9	132.9
Indonesia	454.9	25.3	141.4	134.5	117.9	96.7	48.2
Malaysia	216.2	15.9	77.8	63.0	60.9	23.8	34.1
Mongolia	18.0	0.0	5.6	1.7	1.3	5.8	2.4
Myanmar	21.1	1.1	4.9	4.4	3.1	1.5	1.5
Nepal	8.5	-	2.8	3.9	3.9	0.7	0.5
Pakistan	153.4	1.5	54.4	46.2	44.9	36.6	9.9
Philippines	114.8	1.0	34.7	33.4	28.9	22.0	21.1
Singapore	45.3	5.4	20.4	7.6	6.3	3.4	8.4
Sri Lanka	20.9	0.0	4.4	9.4	9.0	4.2	2.5
Chinese Taipei	257.8	17.0	129.2	38.6	36.9	34.6	22.7
Thailand	244.6	18.8	91.3	69.3	65.5	25.1	27.5
Viet Nam	187.1	-	102.1	36.9	35.7	33.8	11.6
Other non-OECD Asia	51.4	0.0	19.7	13.1	11.1	8.0	6.5
Asia (excl. China)	3 985.0	131.9	1 683.4	761.5	686.8	666.9	335.6
People's Rep. of China	9 056.8	514.2	5 490.4	918.3	726.7	1 110.8	388.8
Hong Kong, China	44.7	-	9.3	7.7	7.7	8.6	19.1
China	9 101.5	514.2	5 499.7	926.0	734.5	1 119.3	407.8
Argentina	190.6	18.6	51.5	46.7	41.2	43.7	18.1
Bolivia	20.2	1.1	3.3	8.2	7.8	3.3	1.2
Brazil	416.7	29.3	112.2	198.8	181.0	36.2	20.2
Colombia	85.9	12.2	19.6	31.5	31.4	9.6	4.4
Costa Rica	7.5	0.0	1.1	5.7	5.7	0.2	0.2
Cuba	23.3	0.5	9.1	1.7	1.5	6.6	2.1
Curaçao ¹	4.1	2.1	0.6	1.1	1.1	0.1	-
Dominican Republic	22.4	0.1	7.4	5.9	4.5	5.2	2.9
Ecuador	35.0	1.5	6.2	16.7	15.9	4.7	2.7
El Salvador	6.8	-	1.5	3.5	3.5	1.1	0.5
Guatemala	16.3	0.1	4.0	8.0	8.0	2.7	1.4
Haiti	3.3	-	1.0	1.4	1.4	0.7	0.1
Honduras	9.1	-	2.2	4.1	3.9	1.6	1.2
Jamaica	7.2	-	3.7	1.8	1.8	1.0	0.2
Nicaragua	5.3	0.0	1.2	2.4	2.1	0.7	1.0
Panama	10.2	-	2.3	4.7	4.7	1.4	1.7
Paraguay	6.4	-	0.2	6.0	6.0	0.2	0.0
Peru	51.3	3.9	15.7	22.3	22.1	5.4	3.3
Suriname	1.9	0.0	0.5	0.6	0.4	0.3	0.2
Trinidad and Tobago	21.1	6.9	7.8	3.7	3.4	2.0	0.7
Uruguay	6.3	0.5	1.0	3.6	3.6	0.6	0.2
Venezuela	127.4	23.4	39.2	40.1	40.0	14.8	9.7
Other non-OECD Americas	20.6	0.0	6.2	6.0	5.6	5.1	0.7
Non-OECD Americas	1 098.8	100.4	297.4	424.5	396.4	147.2	72.7
Bahrain	29.6	3.5	12.3	3.6	3.5	5.8	4.3
Islamic Republic of Iran	563.4	43.2	142.2	130.9	114.8	164.5	45.0
Iraq	139.9	12.2	20.2	25.3	25.3	51.0	5.1
Jordan	23.9	0.7	4.9	8.3	8.3	5.9	2.1
Kuwait	90.2	20.4	17.6	14.2	14.2	26.0	11.9
Lebanon	23.2	-	4.5	5.7	5.7	8.4	2.2
Oman	63.1	7.7	26.5	12.3	12.3	8.0	5.7
Qatar	79.1	31.3	20.3	13.2	13.2	9.0	3.6
Saudi Arabia	527.2	39.8	144.1	136.9	134.0	123.8	82.3
Syrian Arab Republic	26.1	0.6	7.4	6.4	6.4	7.6	1.7
United Arab Emirates	191.8	2.6	78.7	34.6	33.6	31.6	30.1
Yemen	9.2	0.1	1.1	2.8	2.8	4.3	0.5
Middle East	1 766.7	162.2	479.7	394.2	374.0	445.9	194.7

1. Please refer to the chapter Geographical coverage.

Total primary energy supply

petajoules

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
World ¹	198 155	218 466	253 908	269 604	367 338	386 256	420 172	481 264	539 103	572 432	576 164	56.8%
<i>Annex I Parties</i>	..	..	..	..	233 874	229 708	241 737	251 208	245 766	236 541	237 250	1.4%
<i>Annex II Parties</i>	130 364	138 423	153 278	154 095	168 030	180 490	195 049	201 587	194 069	185 449	184 647	9.9%
<i>North America</i>	72 389	76 184	83 601	82 364	89 024	96 345	105 815	108 519	103 830	103 349	102 440	15.1%
<i>Europe</i>	44 327	46 581	51 962	53 017	56 515	58 987	62 324	65 770	63 245	57 973	58 076	2.8%
<i>Asia Oceania</i>	13 648	15 658	17 715	18 714	22 491	25 158	26 910	27 298	26 994	24 127	24 132	7.3%
<i>Annex I EIT</i>	..	..	..	..	63 604	46 567	43 376	45 976	47 133	45 588	46 764	-26.5%
<i>Non-Annex I Parties</i>	..	..	..	..	124 995	146 910	166 971	216 713	278 324	319 814	322 230	157.8%
<i>Annex B Kyoto Parties</i>	..	..	..	..	90 071	85 056	85 906	91 469	89 892	82 455	83 143	-7.7%
Intl. aviation bunkers	2 368	2 432	2 827	3 146	3 622	4 061	4 974	5 913	6 399	7 438	7 800	115.4%
Intl. marine bunkers	4 596	4 432	4 641	3 985	4 846	5 578	6 490	7 431	8 613	8 640	8 884	83.3%
Non-OECD Total	49 996	60 141	76 125	89 845	169 079	172 178	186 593	236 063	296 702	335 761	338 635	100.3%
OECD Total	141 195	151 461	170 314	172 628	189 791	204 439	222 115	231 857	227 388	220 594	220 844	16.4%
Canada	5 918	6 948	8 037	8 081	8 846	9 791	10 616	11 430	11 014	11 756	11 727	32.6%
Chile	364	320	397	401	587	768	1 054	1 188	1 292	1 487	1 582	169.8%
Mexico	1 799	2 476	3 983	4 548	5 179	5 518	6 315	7 561	7 475	7 741	7 752	49.7%
United States	66 470	69 236	75 564	74 283	80 178	86 554	95 199	97 089	92 817	91 593	90 712	13.1%
OECD Americas	74 553	78 980	87 980	87 313	94 789	102 631	113 183	117 268	112 597	112 577	111 774	17.9%
Australia	2 161	2 528	2 914	3 052	3 606	3 873	4 526	4 751	5 330	5 239	5 432	50.6%
Israel ²	240	294	328	317	480	649	763	772	971	950	961	100.1%
Japan	11 201	12 772	14 425	15 194	18 347	20 661	21 668	21 838	20 895	18 025	17 820	-2.9%
Korea	711	1 024	1 727	2 225	3 890	6 061	7 878	8 804	10 468	11 417	11 824	204.0%
New Zealand	286	358	376	469	537	624	716	709	769	863	880	63.7%
OECD Asia Oceania	14 599	16 976	19 770	21 256	26 861	31 867	35 552	36 874	38 433	36 494	36 916	37.4%
Austria	788	842	969	967	1 042	1 123	1 198	1 401	1 409	1 379	1 395	33.9%
Belgium	1 661	1 772	1 958	1 847	2 007	2 236	2 432	2 437	2 517	2 232	2 366	17.9%
Czech Republic	1 900	1 829	1 966	2 062	2 085	1 748	1 727	1 895	1 890	1 760	1 740	-16.6%
Denmark	775	732	801	808	727	812	781	791	816	677	692	-4.7%
Estonia	..	..	..	..	402	217	197	218	235	229	231	-42.4%
Finland	761	825	1 030	1 082	1 188	1 211	1 356	1 440	1 532	1 366	1 424	19.9%
France	6 639	6 907	8 029	8 534	9 372	9 918	10 540	11 416	11 024	10 408	10 227	9.1%
Germany	12 772	13 127	14 955	14 955	14 705	14 089	14 093	14 134	13 664	12 903	12 984	-11.7%
Greece	364	492	627	735	898	950	1 134	1 266	1 156	971	949	5.7%
Hungary	797	959	1 187	1 246	1 205	1 083	1 047	1 174	1 110	1 055	1 073	-11.0%
Iceland	38	46	63	74	95	92	131	131	227	234	221	132.8%
Ireland	281	278	345	361	415	446	578	609	602	556	583	40.5%
Italy	4 413	4 889	5 478	5 414	6 136	6 663	7 182	7 803	7 274	6 387	6 321	3.0%
Latvia	..	..	..	..	330	192	160	190	189	178	178	-46.1%
Luxembourg	170	158	149	128	142	132	140	184	177	156	154	8.9%
Netherlands	2 130	2 471	2 695	2 539	2 814	3 092	3 159	3 408	3 530	3 081	3 121	10.9%
Norway	558	613	768	837	882	984	1 095	1 123	1 231	1 190	1 140	29.3%
Poland	3 604	4 313	5 301	5 221	4 317	4 166	3 719	3 858	4 208	3 974	4 158	-3.7%
Portugal	263	322	418	459	703	845	1 030	1 108	984	921	926	31.8%
Slovak Republic	597	702	831	868	893	744	743	788	746	686	691	-22.7%
Slovenia	..	..	..	..	239	254	269	305	307	275	284	19.0%
Spain	1 784	2 407	2 834	2 969	3 771	4 220	5 102	5 943	5 346	4 978	5 018	33.1%
Sweden	1 509	1 634	1 695	1 977	1 976	2 107	1 991	2 160	2 131	1 904	2 061	4.3%
Switzerland	686	719	839	924	1 020	1 009	1 047	1 086	1 097	1 027	1 001	-1.9%
Turkey	818	1 120	1 317	1 646	2 154	2 550	3 194	3 517	4 426	5 393	5 724	165.8%
United Kingdom	8 737	8 347	8 308	8 407	8 622	9 060	9 336	9 330	8 527	7 604	7 490	-13.1%
OECD Europe	52 044	55 504	62 564	64 060	68 140	69 941	73 380	77 715	76 357	71 523	72 154	5.9%
<i>IEA/Accession/Association</i>	170 648	187 619	215 783	225 824	255 762	284 038	311 508	356 331	395 173	416 332	416 214	62.7%
<i>European Union - 28</i>	..	..	..	..	68 933	69 017	70 976	75 214	72 417	66 550	66 930	-2.9%
<i>G20</i>	..	..	..	..	295 803	312 760	338 310	383 712	426 385	448 638	448 994	51.8%
<i>Africa</i>	8 036	9 319	11 540	14 248	16 399	18 555	20 840	24 876	29 294	33 336	34 240	108.8%
<i>Americas</i>	82 514	88 486	99 610	99 701	108 464	118 124	130 943	137 119	136 877	138 866	137 609	26.9%
<i>Asia</i>	44 229	53 176	66 564	78 327	107 815	128 695	144 645	187 107	239 751	272 803	274 730	154.8%
<i>Europe</i>	53 868	57 620	65 310	66 545	121 900	106 586	106 862	113 154	111 867	104 978	106 315	-12.8%
<i>Oceania</i>	2 543	3 001	3 415	3 653	4 291	4 657	5 417	5 665	6 300	6 371	6 585	53.4%

1. Total world includes non-OECD total, OECD total as well as international marine bunkers and international aviation bunkers.

2. Please refer to the chapter Geographical coverage.

Total primary energy supply

petajoules

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Non-OECD Total	49 996	60 141	76 125	89 845	169 079	172 178	186 593	236 063	296 702	335 761	338 635	100.3%
Albania	72	83	129	114	112	56	75	91	89	92	94	-15.7%
Armenia	..	..	..	..	323	69	84	105	104	128	127	-60.8%
Azerbaijan	..	..	..	..	949	582	473	562	485	601	595	-37.3%
Belarus	..	..	..	..	1 907	1 039	1 034	1 126	1 151	1 056	1 048	-45.0%
Bosnia and Herzegovina	..	..	..	..	294	63	182	211	271	259	283	-3.8%
Bulgaria	797	973	1 189	1 283	1 182	967	779	833	748	779	761	-35.6%
Croatia	..	..	..	..	396	327	351	408	393	352	355	-10.5%
Cyprus ¹	25	24	36	39	57	71	89	93	102	84	90	57.5%
FYR of Macedonia	..	..	..	..	104	105	112	119	120	111	111	7.5%
Georgia	..	..	..	..	520	156	120	119	131	194	201	-61.4%
Gibraltar	1	1	1	2	2	4	5	6	7	9	10	303.0%
Kazakhstan	..	..	..	..	3 075	2 187	1 494	2 130	2 894	3 270	3 418	11.2%
Kosovo	..	..	..	..	..	..	65	81	104	105	113	..
Kyrgyzstan	..	..	..	..	313	100	97	108	115	167	162	-48.5%
Lithuania	..	..	..	..	673	365	299	370	295	295	303	-54.9%
Malta	9	9	13	14	29	30	28	35	35	27	25	-13.4%
Republic of Moldova	..	..	..	..	414	198	121	148	161	155	159	-61.6%
Montenegro	..	..	..	..	..	..	..	43	47	42	41	..
Romania	1 764	2 169	2 731	2 719	2 607	1 951	1 517	1 616	1 467	1 333	1 329	-49.0%
Russian Federation	..	..	..	..	36 816	26 660	25 932	27 287	28 847	29 726	30 662	-16.7%
Serbia	..	..	..	..	825	577	575	673	654	618	640	-22.5%
Tajikistan	..	..	..	..	222	93	90	98	91	115	121	-45.7%
Turkmenistan	..	..	..	..	734	573	623	803	950	1 157	1 155	57.5%
Ukraine	..	..	..	..	10 552	6 854	5 602	5 907	5 545	3 889	3 952	-62.6%
Uzbekistan	..	..	..	..	1 942	1 790	2 130	1 972	1 810	1 631	1 574	-19.0%
Former Soviet Union	..	..	..	..	..	..	..	..	..	..	..	..
Former Yugoslavia	..	..	..	..	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia	2 667	3 259	4 099	4 170	64 048	44 817	41 878	44 946	46 618	46 196	47 327	-26.1%
Algeria	145	231	469	743	929	1 015	1 130	1 358	1 679	2 273	2 250	142.2%
Angola	161	173	191	209	246	266	301	347	538	716	684	177.5%
Benin	46	52	57	65	70	77	83	105	155	179	186	168.0%
Botswana	..	..	..	36	51	61	75	78	90	113	109	114.0%
Cameroon	113	127	153	187	209	232	264	304	292	382	388	86.1%
Congo	21	23	26	32	33	34	30	46	70	112	113	242.0%
Côte d'Ivoire	103	124	150	155	182	216	284	403	426	544	524	187.8%
Dem. Rep. of the Congo	280	313	355	417	494	537	582	698	831	1 210	1 240	151.0%
Egypt	327	410	632	1 074	1 350	1 471	1 679	2 578	3 056	3 322	3 608	167.2%
Eritrea	..	..	..	..	..	42	30	32	31	38	39	..
Ethiopia	582	643	699	805	959	1 142	1 327	1 544	1 785	2 096	2 158	124.9%
Gabon	45	54	58	57	49	56	62	126	213	219	223	351.1%
Ghana	125	153	168	182	222	271	265	246	317	395	392	77.1%
Kenya	220	251	306	360	444	504	586	676	827	1 060	1 088	145.3%
Libya	66	153	295	424	468	586	662	748	856	609	631	34.9%
Mauritius	15	17	18	19	28	33	42	49	55	62	64	131.1%
Morocco	124	166	226	259	319	391	461	621	715	818	816	155.9%
Mozambique	289	280	281	267	248	263	300	355	419	546	552	122.5%
Namibia	..	..	..	..	..	39	44	57	66	80	84	..
Niger	..	..	..	..	..	..	62	73	93	124	122	..
Nigeria	1 389	1 615	2 046	2 391	2 781	3 055	3 645	4 406	5 342	6 071	6 279	125.7%
Senegal	52	58	65	65	71	78	100	117	166	181	181	155.9%
South Africa	1 902	2 274	2 849	3 702	3 756	4 335	4 630	5 119	5 773	5 693	5 880	56.5%
South Sudan	..	..	..	..	..	..	..	..	..	36	33	..
Sudan	294	313	350	396	445	502	557	627	702	770	774	73.8%
United Rep. of Tanzania	317	321	336	367	408	462	564	724	868	1 089	1 109	172.2%
Togo	30	33	37	41	53	66	88	99	130	143	147	177.4%
Tunisia	69	91	137	174	207	243	306	348	431	455	461	122.3%
Zambia	148	164	191	209	227	244	263	315	365	453	466	105.5%
Zimbabwe	228	248	272	310	389	412	419	403	404	472	466	19.8%
Other Africa	945	1 032	1 174	1 302	1 762	1 923	1 996	2 276	2 600	3 076	3 173	80.1%
Africa	8 036	9 319	11 540	14 248	16 399	18 555	20 840	24 876	29 294	33 336	34 240	108.8%

1. Please refer to the chapter Geographical coverage.

Total primary energy supply

petajoules

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Bangladesh	238	282	352	417	534	661	775	974	1 258	1 582	1 656	210.2%
Brunei Darussalam	7	31	57	75	72	94	100	93	136	114	124	71.3%
Cambodia	..	..	..	..	..	119	143	144	223	295	317	..
DPR of Korea	813	932	1 271	1 507	1 391	920	826	893	620	328	369	-73.4%
India	6 357	7 199	8 375	10 342	12 801	15 543	18 461	21 542	29 310	35 024	36 106	182.1%
Indonesia	1 468	1 722	2 333	2 756	4 131	5 479	6 518	7 499	8 661	9 428	9 636	133.3%
Malaysia	253	302	498	651	914	1 448	2 047	2 752	3 073	3 595	3 723	307.2%
Mongolia	..	..	..	131	143	113	100	125	165	195	208	45.5%
Myanmar	331	351	395	460	447	494	538	618	566	744	808	80.7%
Nepal	153	169	191	213	242	281	340	382	428	491	537	121.7%
Pakistan	713	852	1 037	1 351	1 796	2 242	2 660	3 180	3 536	3 918	4 007	123.0%
Philippines	642	764	939	995	1 202	1 408	1 674	1 627	1 692	2 157	2 295	90.9%
Singapore	114	155	215	283	483	789	782	903	1 064	1 119	1 145	137.3%
Sri Lanka	159	172	190	209	231	251	349	377	408	479	490	112.1%
Chinese Taipei	419	599	1 168	1 390	1 999	2 660	3 552	4 282	4 639	4 568	4 592	129.7%
Thailand	573	726	921	1 036	1 756	2 593	3 027	4 146	4 934	5 641	5 800	230.2%
Viet Nam	554	582	603	669	748	916	1 203	1 727	2 467	3 189	3 391	353.3%
Other non-OECD Asia	237	272	324	269	289	289	345	398	514	718	839	190.7%
Asia (excl. China)	13 032	15 112	18 867	22 754	29 179	36 300	43 439	51 663	63 694	73 584	76 044	160.6%
People's Rep. of China	16 374	20 240	25 039	28 946	36 578	43 729	47 306	74 585	106 186	125 245	123 846	238.6%
Hong Kong, China	126	152	194	276	361	443	569	526	573	582	608	68.6%
China	16 500	20 392	25 233	29 222	36 938	44 172	47 875	75 111	106 758	125 827	124 454	236.9%
Argentina	1 409	1 505	1 751	1 731	1 929	2 263	2 578	2 802	3 294	3 583	3 611	87.2%
Bolivia	43	62	102	106	109	158	206	218	264	348	369	237.9%
Brazil	2 922	3 814	4 767	5 416	5 870	6 745	7 848	9 016	11 132	12 360	11 912	102.9%
Colombia	580	646	741	837	1 014	1 156	1 081	1 134	1 306	1 608	1 677	65.3%
Costa Rica	34	42	53	53	70	99	120	162	194	206	213	203.3%
Cuba	439	491	613	640	729	455	533	447	473	461	402	-44.9%
Curaçao ¹	229	161	164	75	61	55	88	87	85	85	74	20.4%
Dominican Republic	98	129	144	142	168	220	308	304	318	349	367	118.2%
Ecuador	94	132	209	235	265	330	369	391	493	631	599	126.1%
El Salvador	73	95	105	110	103	141	166	189	182	180	183	77.3%
Guatemala	115	140	159	158	185	223	295	327	461	528	590	219.3%
Haiti	63	72	87	79	65	71	84	143	159	179	181	177.7%
Honduras	58	64	78	84	100	118	126	173	193	245	245	145.6%
Jamaica	84	112	95	72	110	126	146	150	104	114	122	11.4%
Nicaragua	51	62	64	81	84	95	105	121	124	162	164	94.3%
Panama	69	71	59	65	62	84	108	122	151	178	187	200.2%
Paraguay	57	62	87	95	129	164	161	166	201	227	247	92.3%
Peru	382	434	471	443	408	459	512	571	811	984	1 010	147.8%
Suriname	..	..	..	..	..	..	26	26	29	27	25	..
Trinidad and Tobago	110	97	160	213	251	258	412	675	840	792	764	204.8%
Uruguay	101	102	111	84	94	108	129	124	171	210	219	131.9%
Venezuela	746	963	1 365	1 519	1 655	1 958	2 143	2 285	3 030	2 511	2 352	42.1%
Other non-OECD Americas	203	252	242	151	214	211	215	219	261	321	322	50.7%
Non-OECD Americas	7 961	9 506	11 630	12 388	13 675	15 493	17 760	19 851	24 279	26 289	25 835	88.9%
Bahrain	59	89	117	174	219	269	334	435	532	599	596	172.6%
Islamic Republic of Iran	695	1 115	1 593	2 252	2 903	4 238	5 151	7 230	8 554	9 846	10 369	257.2%
Iraq	168	255	407	616	839	1 406	1 087	1 107	1 568	2 004	2 328	177.4%
Jordan	21	32	64	110	137	180	204	280	297	361	376	174.1%
Kuwait	256	271	438	587	381	619	784	1 100	1 344	1 410	1 500	293.3%
Lebanon	77	91	104	98	82	185	205	211	267	321	326	298.1%
Oman	4	10	48	88	177	255	317	415	784	1 053	1 009	471.4%
Qatar	39	85	139	236	273	341	457	698	1 158	1 837	1 771	547.9%
Saudi Arabia	308	367	1 302	1 926	2 429	3 538	4 097	5 131	7 767	9 283	8 810	262.7%
Syrian Arab Republic	100	128	187	328	438	507	647	871	907	441	416	-5.1%
United Arab Emirates	42	81	303	574	855	1 159	1 320	1 863	2 554	3 221	3 110	263.6%
Yemen	31	29	53	73	105	143	199	276	327	154	123	17.1%
Middle East	1 800	2 553	4 755	7 063	8 839	12 841	14 802	19 617	26 058	30 529	30 735	247.7%

1. Please refer to the chapter Geographical coverage.

Total primary energy supply

million tonnes of oil equivalent

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
World ¹	4 732.9	5 218.0	6 064.5	6 439.4	8 773.7	9 225.6	10 035.6	11 494.8	12 876.2	13 672.3	13 761.5	56.8%
<i>Annex I Parties</i>	..	..	..	..	5 586.0	5 486.5	5 773.8	6 000.0	5 870.0	5 649.7	5 666.6	1.4%
<i>Annex II Parties</i>	3 113.7	3 306.2	3 661.0	3 680.5	4 013.3	4 310.9	4 658.7	4 814.8	4 635.3	4 429.4	4 410.2	9.9%
<i>North America</i>	1 729.0	1 819.6	1 996.8	1 967.2	2 126.3	2 301.2	2 527.3	2 591.9	2 479.9	2 468.4	2 446.7	15.1%
<i>Europe</i>	1 058.7	1 112.6	1 241.1	1 266.3	1 349.8	1 408.9	1 488.6	1 570.9	1 510.6	1 384.7	1 387.1	2.8%
<i>Asia Oceania</i>	326.0	374.0	423.1	447.0	537.2	600.9	642.7	652.0	644.7	576.3	576.4	7.3%
<i>Annex I EIT</i>	..	..	..	..	1 519.2	1 112.2	1 036.0	1 098.1	1 125.8	1 088.8	1 116.9	-26.5%
<i>Non-Annex I Parties</i>	..	..	..	..	2 985.5	3 508.9	3 988.0	5 176.1	6 647.7	7 638.6	7 696.3	157.8%
<i>Annex B Kyoto Parties</i>	..	..	..	..	2 151.3	2 031.5	2 051.8	2 184.7	2 147.0	1 969.4	1 985.8	-7.7%
Intl. aviation bunkers	56.6	58.1	67.5	75.1	86.5	97.0	118.8	141.2	152.8	177.6	186.3	115.4%
Intl. marine bunkers	109.8	105.9	110.9	95.2	115.8	133.2	155.0	177.5	205.7	206.4	212.2	83.3%
Non-OECD Total	1 194.1	1 436.4	1 818.2	2 145.9	4 038.4	4 112.4	4 456.7	5 638.3	7 086.6	8 019.5	8 088.2	100.3%
OECD Total	3 372.4	3 617.6	4 067.9	4 123.2	4 533.1	4 883.0	5 305.1	5 537.8	5 431.1	5 268.8	5 274.8	16.4%
Canada	141.4	166.0	192.0	193.0	211.3	233.9	253.6	273.0	263.1	280.8	280.1	32.6%
Chile	8.7	7.6	9.5	9.6	14.0	18.3	25.2	28.4	30.9	35.5	37.8	169.8%
Mexico	43.0	59.1	95.1	108.6	123.7	131.8	150.8	180.6	178.5	184.9	185.2	49.7%
United States	1 587.6	1 653.7	1 804.8	1 774.2	1 915.0	2 067.3	2 273.8	2 318.9	2 216.9	2 187.7	2 166.6	13.1%
OECD Americas	1 780.7	1 886.4	2 101.4	2 085.4	2 264.0	2 451.3	2 703.3	2 800.9	2 689.3	2 688.8	2 669.7	17.9%
Australia	51.6	60.4	69.6	72.9	86.1	92.5	108.1	113.5	127.3	125.1	129.8	50.6%
Israel ²	5.7	7.0	7.8	7.6	11.5	15.5	18.2	18.4	23.2	22.7	22.9	100.1%
Japan	267.5	305.1	344.5	362.9	438.2	493.5	517.5	521.6	499.1	430.5	425.6	-2.9%
Korea	17.0	24.5	41.3	53.1	92.9	144.8	188.2	210.3	250.0	272.7	282.4	204.0%
New Zealand	6.8	8.5	9.0	11.2	12.8	14.9	17.1	16.9	18.4	20.6	21.0	63.7%
OECD Asia Oceania	348.7	405.5	472.2	507.7	641.6	761.1	849.1	880.7	918.0	871.6	881.7	37.4%
Austria	18.8	20.1	23.2	23.1	24.9	26.8	28.6	33.5	33.7	32.9	33.3	33.9%
Belgium	39.7	42.3	46.8	44.1	47.9	53.4	58.1	58.2	60.1	53.3	56.5	17.9%
Czech Republic	45.4	43.7	47.0	49.2	49.8	41.7	41.2	45.3	45.1	42.0	41.6	-16.6%
Denmark	18.5	17.5	19.1	19.3	17.4	19.4	18.6	18.9	19.5	16.2	16.5	-4.7%
Estonia	..	..	..	..	9.6	5.2	4.7	5.2	5.6	5.5	5.5	-42.5%
Finland	18.2	19.7	24.6	25.8	28.4	28.9	32.4	34.4	36.6	32.6	34.0	19.9%
France	158.6	165.0	191.8	203.8	223.8	236.9	251.7	272.7	263.3	248.6	244.3	9.1%
Germany	305.1	313.5	357.2	357.2	351.2	336.5	336.6	337.6	326.4	308.2	310.1	-11.7%
Greece	8.7	11.7	15.0	17.6	21.4	22.7	27.1	30.2	27.6	23.2	22.7	5.7%
Hungary	19.0	22.9	28.3	29.8	28.8	25.9	25.0	28.1	26.5	25.2	25.6	-11.0%
Iceland	0.9	1.1	1.5	1.8	2.3	2.2	3.1	3.1	5.4	5.6	5.3	132.8%
Ireland	6.7	6.6	8.2	8.6	9.9	10.7	13.8	14.6	14.4	13.3	13.9	40.5%
Italy	105.4	116.8	130.8	129.3	146.6	159.1	171.5	186.4	173.7	152.6	151.0	3.0%
Latvia	..	..	..	..	7.9	4.6	3.8	4.5	4.5	4.3	4.3	-46.1%
Luxembourg	4.1	3.8	3.6	3.1	3.4	3.1	3.4	4.4	4.2	3.7	3.7	8.9%
Netherlands	50.9	59.0	64.4	60.6	67.2	73.9	75.5	81.4	84.3	73.6	74.5	10.9%
Norway	13.3	14.6	18.4	20.0	21.1	23.5	26.2	26.8	29.4	28.4	27.2	29.3%
Poland	86.1	103.0	126.6	124.7	103.1	99.5	88.8	92.1	100.5	94.9	99.3	-3.7%
Portugal	6.3	7.7	10.0	11.0	16.8	20.2	24.6	26.5	23.5	22.0	22.1	31.8%
Slovak Republic	14.3	16.8	19.8	20.7	21.3	17.8	17.7	18.8	17.8	16.4	16.5	-22.7%
Slovenia	..	..	..	..	5.7	6.1	6.4	7.3	7.3	6.6	6.8	19.0%
Spain	42.6	57.5	67.7	70.9	90.1	100.8	121.9	141.9	127.7	118.9	119.8	33.1%
Sweden	36.0	39.0	40.5	47.2	47.2	50.3	47.6	51.6	50.9	45.5	49.2	4.3%
Switzerland	16.4	17.2	20.0	22.1	24.4	24.1	25.0	25.9	26.2	24.5	23.9	-1.9%
Turkey	19.5	26.8	31.5	39.3	51.4	60.9	76.3	84.0	105.7	128.8	136.7	165.8%
United Kingdom	208.7	199.4	198.4	200.8	205.9	216.4	223.0	222.9	203.7	181.6	178.9	-13.1%
OECD Europe	1 243.0	1 325.7	1 494.3	1 530.0	1 627.5	1 670.5	1 752.6	1 856.2	1 823.8	1 708.3	1 723.4	5.9%
<i>IEA/Accession/Association</i>	4 075.9	4 481.2	5 153.9	5 393.7	6 108.8	6 784.1	7 440.3	8 510.8	9 438.5	9 943.9	9 941.1	62.7%
<i>European Union - 28</i>	..	..	..	..	1 646.4	1 648.4	1 695.2	1 796.5	1 729.6	1 589.5	1 598.6	-2.9%
<i>G20</i>	..	..	..	..	7 065.1	7 470.1	8 080.4	9 164.8	10 184.0	10 715.5	10 724.0	51.8%
<i>Africa</i>	191.9	222.6	275.6	340.3	391.7	443.2	497.8	594.2	699.7	796.2	817.8	108.8%
<i>Americas</i>	1 970.8	2 113.5	2 379.1	2 381.3	2 590.6	2 821.3	3 127.5	3 275.0	3 269.2	3 316.7	3 286.7	26.9%
<i>Asia</i>	1 056.4	1 270.1	1 589.9	1 870.8	2 575.1	3 073.8	3 454.8	4 469.0	5 726.4	6 515.8	6 561.8	154.8%
<i>Europe</i>	1 286.6	1 376.2	1 559.9	1 589.4	2 911.5	2 545.8	2 552.4	2 702.6	2 671.9	2 507.4	2 539.3	-12.8%
<i>Oceania</i>	60.8	71.7	81.6	87.2	102.5	111.2	129.4	135.3	150.5	152.2	157.3	53.4%

1. Total world includes non-OECD total, OECD total as well as international marine bunkers and international aviation bunkers.

2. Please refer to the chapter Geographical coverage.

Total primary energy supply

million tonnes of oil equivalent

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Non-OECD Total	1 194.1	1 436.4	1 818.2	2 145.9	4 038.4	4 112.4	4 456.7	5 638.3	7 086.6	8 019.5	8 088.2	100.3%
Albania	1.7	2.0	3.1	2.7	2.7	1.3	1.8	2.2	2.1	2.2	2.3	-15.7%
Armenia	..	..	..	..	7.7	1.6	2.0	2.5	2.5	3.1	3.0	-60.8%
Azerbaijan	..	..	..	..	22.7	13.9	11.3	13.4	11.6	14.4	14.2	-37.3%
Belarus	..	..	..	..	45.5	24.8	24.7	26.9	27.5	25.2	25.0	-45.0%
Bosnia and Herzegovina	..	..	..	..	7.0	1.5	4.3	5.0	6.5	6.2	6.8	-3.8%
Bulgaria	19.0	23.2	28.4	30.6	28.2	23.1	18.6	19.9	17.9	18.6	18.2	-35.6%
Croatia	..	..	..	..	9.5	7.8	8.4	9.7	9.4	8.4	8.5	-10.5%
Cyprus ¹	0.6	0.6	0.9	0.9	1.4	1.7	2.1	2.2	2.4	2.0	2.2	57.6%
FYR of Macedonia	..	..	..	..	2.5	2.5	2.7	2.9	2.9	2.6	2.7	7.5%
Georgia	..	..	..	..	12.4	3.7	2.9	2.8	3.1	4.6	4.8	-61.4%
Gibraltar	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	300.0%
Kazakhstan	..	..	..	..	73.5	52.2	35.7	50.9	69.1	78.1	81.6	11.2%
Kosovo	..	..	..	..	..	..	1.5	1.9	2.5	2.5	2.7	..
Kyrgyzstan	..	..	..	..	7.5	2.4	2.3	2.6	2.8	4.0	3.9	-48.5%
Lithuania	..	..	..	..	16.1	8.7	7.1	8.8	7.1	7.1	7.2	-54.9%
Malta	0.2	0.2	0.3	0.3	0.7	0.7	0.7	0.8	0.8	0.6	0.6	-13.4%
Republic of Moldova	..	..	..	..	9.9	4.7	2.9	3.5	3.8	3.7	3.8	-61.6%
Montenegro	..	..	..	..	..	..	..	1.0	1.1	1.0	1.0	..
Romania	42.1	51.8	65.2	64.9	62.3	46.6	36.2	38.6	35.0	31.8	31.7	-49.0%
Russian Federation	..	..	..	..	879.3	636.8	619.4	651.7	689.0	710.0	732.4	-16.7%
Serbia	..	..	..	..	19.7	13.8	13.7	16.1	15.6	14.8	15.3	-22.5%
Tajikistan	..	..	..	..	5.3	2.2	2.1	2.3	2.2	2.8	2.9	-45.7%
Turkmenistan	..	..	..	..	17.5	13.7	14.9	19.2	22.7	27.6	27.6	57.5%
Ukraine	..	..	..	..	252.0	163.7	133.8	141.1	132.4	92.9	94.4	-62.6%
Uzbekistan	..	..	..	..	46.4	42.8	50.9	47.1	43.2	39.0	37.6	-19.0%
Former Soviet Union	..	..	..	..	..	..	..	..	..	..	..	..
Former Yugoslavia	..	..	..	..	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia	63.7	77.8	97.9	99.6	1 529.8	1 070.4	1 000.2	1 073.5	1 113.5	1 103.4	1 130.4	-26.1%
Algeria	3.5	5.5	11.2	17.7	22.2	24.2	27.0	32.4	40.1	54.3	53.7	142.2%
Angola	3.9	4.1	4.6	5.0	5.9	6.4	7.2	8.3	12.8	17.1	16.3	177.5%
Benin	1.1	1.2	1.4	1.5	1.7	1.8	2.0	2.5	3.7	4.3	4.5	167.9%
Botswana	..	..	..	0.9	1.2	1.4	1.8	1.9	2.1	2.7	2.6	114.0%
Cameroon	2.7	3.0	3.7	4.5	5.0	5.5	6.3	7.3	7.0	9.1	9.3	86.1%
Congo	0.5	0.6	0.6	0.8	0.8	0.8	0.7	1.1	1.7	2.7	2.7	242.2%
Côte d'Ivoire	2.5	3.0	3.6	3.7	4.3	5.2	6.8	9.6	10.2	13.0	12.5	187.8%
Dem. Rep. of the Congo	6.7	7.5	8.5	10.0	11.8	12.8	13.9	16.7	19.9	28.9	29.6	151.0%
Egypt	7.8	9.8	15.1	25.7	32.3	35.1	40.1	61.6	73.0	79.4	86.2	167.2%
Eritrea	..	..	..	..	..	1.0	0.7	0.8	0.7	0.9	0.9	..
Ethiopia	13.9	15.3	16.7	19.2	22.9	27.3	31.7	36.9	42.6	50.1	51.5	124.9%
Gabon	1.1	1.3	1.4	1.4	1.2	1.3	1.5	3.0	5.1	5.2	5.3	351.0%
Ghana	3.0	3.7	4.0	4.4	5.3	6.5	6.3	5.9	7.6	9.4	9.4	77.1%
Kenya	5.2	6.0	7.3	8.6	10.6	12.0	14.0	16.1	19.7	25.3	26.0	145.3%
Libya	1.6	3.7	7.1	10.1	11.2	14.0	15.8	17.9	20.5	14.6	15.1	34.9%
Mauritius	0.4	0.4	0.4	0.4	0.7	0.8	1.0	1.2	1.3	1.5	1.5	131.2%
Morocco	3.0	4.0	5.4	6.2	7.6	9.3	11.0	14.8	17.1	19.5	19.5	155.9%
Mozambique	6.9	6.7	6.7	6.4	5.9	6.3	7.2	8.5	10.0	13.0	13.2	122.5%
Namibia	..	..	..	..	..	0.9	1.1	1.4	1.6	1.9	2.0	..
Niger	..	..	..	..	..	..	1.5	1.7	2.2	3.0	2.9	..
Nigeria	33.2	38.6	48.9	57.1	66.4	73.0	87.1	105.2	127.6	145.0	150.0	125.7%
Senegal	1.2	1.4	1.6	1.6	1.7	1.9	2.4	2.8	4.0	4.3	4.3	155.8%
South Africa	45.4	54.3	68.0	88.4	89.7	103.5	110.6	122.3	137.9	136.0	140.4	56.5%
South Sudan	..	..	..	..	..	..	..	..	..	0.8	0.8	..
Sudan	7.0	7.5	8.4	9.5	10.6	12.0	13.3	15.0	16.8	18.4	18.5	73.8%
United Rep. of Tanzania	7.6	7.7	8.0	8.8	9.7	11.0	13.5	17.3	20.7	26.0	26.5	172.2%
Togo	0.7	0.8	0.9	1.0	1.3	1.6	2.1	2.4	3.1	3.4	3.5	177.5%
Tunisia	1.7	2.2	3.3	4.2	4.9	5.8	7.3	8.3	10.3	10.9	11.0	122.3%
Zambia	3.5	3.9	4.6	5.0	5.4	5.8	6.3	7.5	8.7	10.8	11.1	105.5%
Zimbabwe	5.4	5.9	6.5	7.4	9.3	9.8	10.0	9.6	9.6	11.3	11.1	19.8%
Other Africa	22.6	24.7	28.0	31.1	42.1	45.9	47.7	54.4	62.1	73.5	75.8	80.1%
Africa	191.9	222.6	275.6	340.3	391.7	443.2	497.8	594.2	699.7	796.2	817.8	108.8%

1. Please refer to the chapter Geographical coverage.

Total primary energy supply

million tonnes of oil equivalent

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Bangladesh	5.7	6.7	8.4	10.0	12.8	15.8	18.5	23.3	30.1	37.8	39.6	210.2%
Brunei Darussalam	0.2	0.7	1.4	1.8	1.7	2.2	2.4	2.2	3.2	2.7	3.0	71.3%
Cambodia	..	..	..	..	..	2.8	3.4	3.4	5.3	7.0	7.6	..
DPR of Korea	19.4	22.3	30.4	36.0	33.2	22.0	19.7	21.3	14.8	7.8	8.8	-73.4%
India	151.8	171.9	200.0	247.0	305.7	371.2	440.9	514.5	700.1	836.5	862.4	182.1%
Indonesia	35.1	41.1	55.7	65.8	98.7	130.9	155.7	179.1	206.9	225.2	230.2	133.3%
Malaysia	6.1	7.2	11.9	15.6	21.8	34.6	48.9	65.7	73.4	85.9	88.9	307.2%
Mongolia	..	..	..	3.1	3.4	2.7	2.4	3.0	3.9	4.6	5.0	45.6%
Myanmar	7.9	8.4	9.4	11.0	10.7	11.8	12.8	14.8	13.5	17.8	19.3	80.8%
Nepal	3.7	4.0	4.6	5.1	5.8	6.7	8.1	9.1	10.2	11.7	12.8	121.7%
Pakistan	17.0	20.4	24.8	32.3	42.9	53.5	63.5	76.0	84.5	93.6	95.7	123.0%
Philippines	15.3	18.3	22.4	23.8	28.7	33.6	40.0	38.9	40.4	51.5	54.8	90.9%
Singapore	2.7	3.7	5.1	6.8	11.5	18.8	18.7	21.6	25.4	26.7	27.4	137.3%
Sri Lanka	3.8	4.1	4.5	5.0	5.5	6.0	8.3	9.0	9.7	11.4	11.7	112.1%
Chinese Taipei	10.0	14.3	27.9	33.2	47.7	63.5	84.8	102.3	110.8	109.1	109.7	129.7%
Thailand	13.7	17.3	22.0	24.7	41.9	61.9	72.3	99.0	117.9	134.7	138.5	230.2%
Viet Nam	13.2	13.9	14.4	16.0	17.9	21.9	28.7	41.3	58.9	76.2	81.0	353.3%
Other non-OECD Asia	5.7	6.5	7.7	6.4	6.9	6.9	8.2	9.5	12.3	17.1	20.0	190.7%
Asia (excl. China)	311.3	360.9	450.6	543.5	696.9	867.0	1 037.5	1 234.0	1 521.3	1 757.5	1 816.3	160.6%
People's Rep. of China	391.1	483.4	598.1	691.4	873.6	1 044.5	1 129.9	1 781.4	2 536.2	2 991.4	2 958.0	238.6%
Hong Kong, China	3.0	3.6	4.6	6.6	8.6	10.6	13.6	12.6	13.7	13.9	14.5	68.6%
China	394.1	487.1	602.7	698.0	882.3	1 055.0	1 143.5	1 794.0	2 549.9	3 005.3	2 972.5	236.9%
Argentina	33.7	35.9	41.8	41.4	46.1	54.1	61.6	66.9	78.7	85.6	86.3	87.2%
Bolivia	1.0	1.5	2.4	2.5	2.6	3.8	4.9	5.2	6.3	8.3	8.8	237.8%
Brazil	69.8	91.1	113.9	129.4	140.2	161.1	187.4	215.3	265.9	295.2	284.5	102.9%
Colombia	13.9	15.4	17.7	20.0	24.2	27.6	25.8	27.1	31.2	38.4	40.0	65.3%
Costa Rica	0.8	1.0	1.3	1.3	1.7	2.4	2.9	3.9	4.6	4.9	5.1	203.4%
Cuba	10.5	11.7	14.6	15.3	17.4	10.9	12.7	10.7	11.3	11.0	9.6	-44.9%
Curaçao ¹	5.5	3.8	3.9	1.8	1.5	1.3	2.1	2.1	2.0	2.0	1.8	20.4%
Dominican Republic	2.3	3.1	3.4	3.4	4.0	5.2	7.4	7.3	7.6	8.3	8.8	118.2%
Ecuador	2.2	3.1	5.0	5.6	6.3	7.9	8.8	9.3	11.8	15.1	14.3	126.1%
El Salvador	1.8	2.3	2.5	2.6	2.5	3.4	4.0	4.5	4.4	4.3	4.4	77.3%
Guatemala	2.7	3.3	3.8	3.8	4.4	5.3	7.0	7.8	11.0	12.6	14.1	219.2%
Haiti	1.5	1.7	2.1	1.9	1.6	1.7	2.0	3.4	3.8	4.3	4.3	177.6%
Honduras	1.4	1.5	1.9	2.0	2.4	2.8	3.0	4.1	4.6	5.8	5.8	145.6%
Jamaica	2.0	2.7	2.3	1.7	2.6	3.0	3.5	3.6	2.5	2.7	2.9	11.4%
Nicaragua	1.2	1.5	1.5	1.9	2.0	2.3	2.5	2.9	3.0	3.9	3.9	94.3%
Panama	1.7	1.7	1.4	1.6	1.5	2.0	2.6	2.9	3.6	4.3	4.5	200.1%
Paraguay	1.4	1.5	2.1	2.3	3.1	3.9	3.9	4.0	4.8	5.4	5.9	92.3%
Peru	9.1	10.4	11.3	10.6	9.7	11.0	12.2	13.6	19.4	23.5	24.1	147.8%
Suriname	..	..	..	..	..	..	0.6	0.6	0.7	0.6	0.6	..
Trinidad and Tobago	2.6	2.3	3.8	5.1	6.0	6.2	9.8	16.1	20.1	18.9	18.3	204.8%
Uruguay	2.4	2.4	2.6	2.0	2.3	2.6	3.1	3.0	4.1	5.0	5.2	131.9%
Venezuela	17.8	23.0	32.6	36.3	39.5	46.8	51.2	54.6	72.4	60.0	56.2	42.1%
Other non-OECD Americas	4.9	6.0	5.8	3.6	5.1	5.0	5.1	5.2	6.2	7.7	7.7	50.7%
Non-OECD Americas	190.1	227.1	277.8	295.9	326.6	370.0	424.2	474.1	579.9	627.9	617.1	88.9%
Bahrain	1.4	2.1	2.8	4.2	5.2	6.4	8.0	10.4	12.7	14.3	14.2	172.5%
Islamic Republic of Iran	16.6	26.6	38.1	53.8	69.3	101.2	123.0	172.7	204.3	235.2	247.7	257.2%
Iraq	4.0	6.1	9.7	14.7	20.0	33.6	26.0	26.4	37.4	47.9	55.6	177.4%
Jordan	0.5	0.8	1.5	2.6	3.3	4.3	4.9	6.7	7.1	8.6	9.0	174.1%
Kuwait	6.1	6.5	10.5	14.0	9.1	14.8	18.7	26.3	32.1	33.7	35.8	293.3%
Lebanon	1.8	2.2	2.5	2.3	2.0	4.4	4.9	5.0	6.4	7.7	7.8	298.1%
Oman	0.1	0.2	1.2	2.1	4.2	6.1	7.6	9.9	18.7	25.1	24.1	471.4%
Qatar	0.9	2.0	3.3	5.6	6.5	8.2	10.9	16.7	27.6	43.9	42.3	547.9%
Saudi Arabia	7.4	8.8	31.1	46.0	58.0	84.5	97.9	122.6	185.5	221.7	210.4	262.7%
Syrian Arab Republic	2.4	3.1	4.5	7.8	10.5	12.1	15.4	20.8	21.7	10.5	9.9	-5.1%
United Arab Emirates	1.0	1.9	7.2	13.7	20.4	27.7	31.5	44.5	61.0	76.9	74.3	263.6%
Yemen	0.7	0.7	1.3	1.7	2.5	3.4	4.7	6.6	7.8	3.7	2.9	17.1%
Middle East	43.0	61.0	113.6	168.7	211.1	306.7	353.5	468.5	622.4	729.2	734.1	247.7%

1. Please refer to the chapter Geographical coverage.

GDP using exchange rates

billion 2010 US dollars

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
World	20 212	23 505	28 406	32 143	37 943	42 186	49 978	58 084	65 944	75 597	77 362	103.9%
<i>Annex I Parties</i>	..	..	..	..	30 125.6	32 317.0	37 715.7	42 181.5	44 230.9	48 109.5	48 872.5	62.2%
<i>Annex II Parties</i>	14 990.8	16 917.2	20 101.9	22 933.4	27 286.0	30 085.9	35 177.7	38 904.4	40 392.6	43 699.2	44 383.4	62.7%
<i>North America</i>	5 484.0	6 102.3	7 310.5	8 577.6	10 078.5	11 401.8	14 055.8	15 932.6	16 577.8	18 475.2	18 748.3	86.0%
<i>Europe</i>	7 014.1	7 874.7	9 199.4	9 991.8	11 746.0	12 732.4	14 703.9	16 031.9	16 670.8	17 564.2	17 884.0	52.3%
<i>Asia Oceania</i>	2 492.7	2 940.1	3 592.1	4 364.0	5 461.5	5 951.7	6 418.1	6 939.9	7 143.9	7 659.8	7 751.2	41.9%
<i>Annex I EIT</i>	..	..	..	..	2 459.1	1 783.6	1 990.9	2 588.5	3 032.1	3 288.1	3 330.9	35.5%
<i>Non-Annex I Parties</i>	..	..	..	..	7 817.6	9 868.9	12 262.5	15 902.9	21 713.1	27 487.1	28 489.9	264.4%
<i>Annex B Kyoto Parties</i>	..	..	..	..	13 579.2	14 509.4	16 793.5	18 610.7	19 657.6	20 934.5	21 333.1	57.1%
Non-OECD Total	4 251.7	5 364.5	6 795.9	7 475.0	8 543.8	9 592.2	11 630.6	15 418.6	21 176.5	26 647.4	27 575.5	222.8%
OECD Total	15 960.0	18 140.3	21 610.5	24 668.1	29 399.3	32 593.7	38 347.6	42 665.8	44 767.4	48 949.3	49 786.9	69.3%
Canada	546.8	651.2	781.3	891.0	1 014.1	1 102.8	1 342.7	1 524.5	1 613.5	1 802.5	1 828.0	80.3%
Chile	42.9	36.7	52.1	54.5	75.5	114.5	144.5	181.7	218.5	264.6	267.9	255.0%
Mexico	295.6	389.6	537.8	591.9	643.2	707.4	915.2	982.7	1 057.8	1 223.4	1 259.0	95.7%
United States	4 937.2	5 451.1	6 529.2	7 686.6	9 064.4	10 299.0	12 713.1	14 408.1	14 964.4	16 672.7	16 920.3	86.7%
OECD Americas	5 822.5	6 528.7	7 900.4	9 224.0	10 797.2	12 223.7	15 115.5	17 097.0	17 854.2	19 963.2	20 275.3	87.8%
Australia	390.9	434.1	502.7	581.7	675.2	791.3	957.4	1 131.6	1 297.3	1 493.1	1 522.4	125.5%
Israel ¹	43.9	57.1	66.0	77.0	95.5	132.1	171.0	188.9	233.6	278.0	289.0	202.7%
Japan	2 042.9	2 436.4	3 019.3	3 700.7	4 703.6	5 063.8	5 348.9	5 672.3	5 700.1	5 996.4	6 052.7	28.7%
Korea	64.6	93.9	141.1	220.6	362.9	543.6	710.0	894.7	1 094.5	1 268.8	1 305.9	259.9%
New Zealand	58.9	69.6	70.0	81.5	82.7	96.5	111.8	136.0	146.6	170.2	176.1	113.0%
OECD Asia Oceania	2 601.2	3 091.1	3 799.1	4 661.5	5 919.9	6 627.4	7 299.1	8 023.5	8 472.1	9 206.5	9 346.1	57.9%
Austria	153.6	177.3	208.3	224.1	260.2	290.4	336.5	367.3	391.9	414.0	420.0	61.4%
Belgium	201.4	231.3	270.4	283.4	330.0	357.1	411.8	450.5	483.5	507.9	515.1	56.1%
Czech Republic	100.2	114.3	127.2	133.6	144.6	139.0	151.8	183.9	207.5	225.5	231.3	60.0%
Denmark	155.1	163.4	186.4	213.3	229.1	257.1	298.2	318.6	322.0	340.8	347.5	51.7%
Estonia	..	..	..	..	15.0	10.5	14.1	19.9	19.5	23.3	23.8	59.3%
Finland	86.6	104.9	122.6	141.1	167.1	163.4	209.4	237.9	247.8	247.4	252.7	51.2%
France	1 101.3	1 264.0	1 492.1	1 615.1	1 907.3	2 033.1	2 346.5	2 547.2	2 646.8	2 777.5	2 810.5	47.4%
Germany	1 582.1	1 729.3	2 040.5	2 183.6	2 568.6	2 841.0	3 123.9	3 213.8	3 417.1	3 709.6	3 781.7	47.2%
Greece	127.0	150.5	184.6	185.8	197.7	210.3	251.5	304.3	299.4	245.1	244.5	23.7%
Hungary	60.9	78.1	93.1	101.5	104.2	92.5	107.1	132.3	130.9	144.0	147.2	41.2%
Iceland	3.6	4.4	5.9	6.7	7.8	7.9	10.3	12.6	13.3	15.3	16.4	111.2%
Ireland	38.0	46.7	58.4	66.2	83.3	104.5	163.4	214.3	222.0	316.1	332.4	298.8%
Italy	967.4	1 110.0	1 379.8	1 500.0	1 749.2	1 866.2	2 060.2	2 158.7	2 125.1	2 062.9	2 080.6	18.9%
Latvia	..	..	..	..	..	12.8	16.4	24.4	23.8	28.3	28.9	..
Luxembourg	11.8	13.3	14.9	16.8	24.1	30.6	40.8	47.2	53.2	61.3	63.2	162.0%
Netherlands	326.6	369.7	425.6	450.0	530.5	594.2	734.7	785.1	836.4	870.9	890.1	67.8%
Norway	132.2	158.7	198.3	235.1	255.6	307.1	367.0	409.1	429.1	467.7	472.8	84.9%
Poland	171.1	218.8	228.2	230.2	226.7	252.4	326.2	379.8	479.3	556.2	572.7	152.7%
Portugal	81.2	94.3	121.0	126.4	166.6	181.3	221.4	231.1	238.3	228.1	231.7	39.1%
Slovak Republic	34.7	39.6	44.1	47.7	51.1	46.6	55.5	71.0	89.5	101.3	104.7	104.8%
Slovenia	..	..	..	..	30.9	30.0	36.9	44.1	48.0	49.0	50.5	63.7%
Spain	479.2	593.3	653.9	700.8	873.1	940.9	1 149.5	1 358.1	1 431.6	1 418.1	1 464.5	67.7%
Sweden	214.9	241.8	258.4	285.2	321.1	332.7	396.5	451.4	488.4	542.8	560.4	74.5%
Switzerland	318.9	319.1	346.9	373.8	432.1	434.9	487.1	524.1	583.8	633.4	642.1	48.6%
Turkey	155.2	194.9	219.0	277.7	364.0	426.3	520.9	658.1	771.9	1 087.8	1 122.5	208.4%
United Kingdom	1 033.1	1 102.8	1 231.3	1 384.3	1 642.5	1 779.7	2 095.2	2 400.4	2 441.2	2 705.3	2 757.6	67.9%
OECD Europe ¹	7 536.2	8 520.4	9 911.0	10 782.6	12 682.3	13 742.5	15 932.9	17 545.3	18 441.2	19 779.6	20 165.6	59.0%
<i>IEA/Accession/Association</i>	17 276.1	19 893.4	24 007.2	27 552.0	32 959.5	37 378.9	44 469.8	50 933.2	56 898.5	65 125.6	66 728.9	102.5%
<i>European Union - 28</i>	..	..	..	..	11 874.8	12 789.6	14 787.5	16 254.1	16 992.8	17 956.8	18 308.2	54.2%
<i>G20</i>	..	..	..	..	33 730.1	37 487.3	44 382.1	51 140.7	57 294.1	65 479.9	67 027.7	98.7%
<i>Africa</i>	571.0	647.0	793.2	839.8	926.9	975.4	1 165.3	1 511.7	1 951.6	2 304.5	2 345.3	153.0%
<i>Americas</i>	6 933.0	7 972.0	9 745.4	11 116.2	12 893.9	14 710.5	17 877.9	20 287.3	21 825.1	24 304.6	24 481.6	89.9%
<i>Asia</i>	3 596.3	4 442.1	5 598.5	6 793.0	9 086.1	11 026.7	13 083.3	16 284.8	20 889.5	26 325.6	27 471.6	202.3%
<i>Europe</i>	7 454.8	8 433.8	9 845.8	10 684.2	14 261.8	14 565.2	16 760.5	18 708.9	19 806.4	20 965.1	21 331.2	49.6%
<i>Oceania</i>	460.2	515.7	586.4	677.9	774.5	908.0	1 091.0	1 291.7	1 471.3	1 697.0	1 732.8	123.7%

1. Please refer to the chapter Geographical coverage.

GDP using exchange rates

billion 2010 US dollars

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Non-OECD Total	4 251.7	5 364.5	6 795.9	7 475.0	8 543.8	9 592.2	11 630.6	15 418.6	21 176.5	26 647.4	27 575.5	222.8%
Albania	3.3	4.1	5.4	6.0	6.2	5.4	7.0	9.3	11.9	13.1	13.6	119.4%
Armenia	..	..	..	..	6.4	3.4	4.3	7.7	9.3	11.5	11.5	80.6%
Azerbaijan	..	..	..	..	22.3	9.3	13.1	24.8	52.9	59.0	57.2	156.2%
Belarus	..	..	..	..	31.6	20.6	28.0	40.3	57.2	60.7	59.1	87.0%
Bosnia and Herzegovina	..	..	..	..	3.4	3.3	11.3	14.9	17.2	18.3	18.7	449.4%
Bulgaria	15.5	21.2	28.6	33.7	36.3	31.8	32.8	43.5	50.6	54.6	56.5	55.7%
Croatia	..	..	..	..	48.1	39.6	46.8	58.3	59.7	58.2	59.9	24.6%
Cyprus ¹	3.2	3.8	6.7	8.8	12.3	15.6	19.0	22.6	25.6	23.4	24.0	96.0%
FYR of Macedonia	..	..	..	..	7.7	6.1	7.0	7.7	9.4	10.6	10.9	41.3%
Georgia	..	..	..	..	16.9	4.8	6.3	9.0	11.6	14.8	15.2	-10.4%
Gibraltar	0.5	0.5	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	76.1%
Kazakhstan	..	..	..	..	96.3	59.1	66.9	109.5	148.0	186.3	188.1	95.4%
Kosovo	..	..	..	..	..	..	3.3	4.7	5.8	6.8	7.1	..
Kyrgyzstan	..	..	..	..	4.8	2.4	3.2	3.9	4.8	6.1	6.3	31.3%
Lithuania	..	..	..	..	27.0	19.3	24.3	35.0	37.1	44.6	45.6	68.8%
Malta	1.2	1.7	2.9	3.2	4.3	5.6	7.1	7.9	8.7	11.1	11.6	172.7%
Republic of Moldova	..	..	..	..	10.0	4.0	3.5	5.0	5.8	7.0	7.3	-26.5%
Montenegro	..	..	..	..	..	..	..	3.3	4.1	4.5	4.6	..
Romania	53.3	80.7	116.3	135.8	124.0	111.4	110.0	145.5	168.0	189.5	198.6	60.2%
Russian Federation	..	..	..	..	1 413.9	878.3	951.6	1 281.3	1 524.9	1 631.6	1 628.0	15.1%
Serbia	..	..	..	..	24.6	24.0	25.6	34.6	39.5	40.2	41.3	68.2%
Tajikistan	..	..	..	..	6.8	2.6	2.6	4.1	5.6	7.9	8.5	25.3%
Turkmenistan	..	..	..	..	13.7	8.6	10.8	13.8	22.6	37.3	39.6	189.2%
Ukraine	..	..	..	..	205.8	98.8	89.4	129.4	136.0	121.2	124.0	-39.7%
Uzbekistan	..	..	..	..	20.5	16.6	20.0	26.1	39.3	57.9	62.5	205.4%
Former Soviet Union	1 118.1	1 398.1	1 707.8	1 900.4	..	..	..	..	..	..	..	..
Former Yugoslavia	78.3	96.1	129.3	131.6	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia	1 273.3	1 606.2	1 997.6	2 220.1	2 143.4	1 371.5	1 494.7	2 043.1	2 456.8	2 677.4	2 700.9	26.0%
Algeria	34.7	51.9	70.0	88.6	92.0	93.2	110.4	142.3	161.2	189.8	196.8	113.9%
Angola	24.7	24.9	25.0	27.3	32.0	25.3	34.5	46.2	82.5	103.9	103.9	224.6%
Benin	1.7	1.8	2.2	2.8	3.0	3.7	4.8	5.8	7.0	8.8	9.1	200.1%
Botswana	..	..	..	3.0	5.3	6.6	8.6	10.2	12.8	16.1	16.6	212.4%
Cameroon	5.9	7.9	10.7	16.8	14.9	13.6	17.1	20.5	23.6	30.4	31.8	113.7%
Congo	2.4	3.3	4.1	6.7	6.6	6.8	7.6	9.3	12.0	14.6	14.3	116.6%
Côte d'Ivoire	10.8	13.5	16.5	16.8	17.8	19.1	22.3	22.3	24.9	34.1	37.0	108.5%
Dem. Rep. of the Congo	21.5	22.9	21.2	23.2	23.1	15.9	13.0	15.7	20.5	29.8	30.5	31.9%
Egypt	28.7	33.0	52.6	72.8	89.6	105.9	136.4	162.2	218.9	250.0	260.7	191.1%
Eritrea	..	..	..	..	..	1.7	1.9	2.2	2.1	2.8	2.9	..
Ethiopia	7.9	8.0	8.2	7.8	10.0	10.5	13.1	17.9	29.9	48.7	52.3	425.4%
Gabon	4.7	9.5	8.9	10.0	10.6	12.3	12.5	13.6	14.4	18.5	18.9	79.0%
Ghana	9.9	9.3	9.7	9.5	12.0	14.9	18.4	23.5	32.2	46.5	48.2	299.8%
Kenya	8.3	10.8	14.6	16.5	21.8	23.6	26.2	31.3	40.0	52.3	55.4	154.5%
Libya	57.1	46.1	72.7	51.9	46.9	45.4	48.0	61.7	74.8	19.6	18.8	-60.0%
Mauritius	1.3	1.7	2.2	2.7	3.9	5.0	6.6	7.7	10.0	12.0	12.4	215.8%
Morocco	17.3	20.9	27.2	33.3	43.2	47.1	57.5	73.0	93.2	113.2	114.5	165.1%
Mozambique	2.6	2.2	2.3	1.8	2.3	2.7	4.6	7.1	10.2	14.3	14.9	548.5%
Namibia	..	..	..	..	..	6.0	7.1	9.1	11.3	14.8	14.9	..
Niger	..	..	..	..	..	..	3.7	4.4	5.7	7.6	8.0	..
Nigeria	103.4	118.6	143.8	124.5	130.9	134.2	157.5	260.5	369.1	464.3	457.1	249.1%
Senegal	4.2	4.7	5.0	5.7	6.4	7.1	8.7	10.9	12.9	15.8	16.9	163.6%
South Africa	143.7	164.8	191.9	205.3	222.9	232.7	267.0	322.2	375.3	418.4	419.6	88.2%
South Sudan	..	..	..	..	..	..	..	..	..	8.9	9.3	..
Sudan	11.2	13.8	15.5	16.0	19.8	25.4	34.1	46.4	65.6	72.7	76.1	284.1%
United Rep. of Tanzania	6.1	7.2	8.3	9.3	12.2	13.4	16.5	23.4	31.4	43.7	46.8	282.3%
Togo	1.2	1.5	1.9	1.8	2.1	2.1	2.6	2.7	3.2	4.0	4.2	105.6%
Tunisia	7.0	9.5	12.9	15.9	18.3	22.2	29.1	35.3	44.1	48.1	48.6	165.2%
Zambia	6.6	7.4	7.6	7.7	8.4	8.3	9.9	13.4	20.3	26.1	26.9	220.9%
Zimbabwe	6.7	7.8	8.4	10.3	12.9	13.7	15.4	10.5	10.1	14.6	14.7	13.8%
Other Africa	41.6	44.2	49.8	51.6	57.9	57.3	70.5	100.6	132.6	160.1	163.1	181.7%
Africa	571.0	647.0	793.2	839.8	926.9	975.4	1 165.3	1 511.7	1 951.6	2 304.5	2 345.3	153.0%

1. Please refer to the chapter Geographical coverage.

GDP using exchange rates

billion 2010 US dollars

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Bangladesh	25.0	23.3	28.6	35.3	42.4	52.9	67.0	85.9	115.3	156.6	167.8	295.5%
Brunei Darussalam	5.8	7.1	11.5	9.6	9.6	11.2	12.0	13.3	13.7	13.6	13.3	38.6%
Cambodia	..	..	..	..	..	3.7	5.2	8.1	11.2	15.9	17.0	..
DPR of Korea	8.3	13.0	22.4	35.8	42.7	33.5	29.8	28.9	26.8	26.9	27.1	-36.4%
India	205.4	233.0	271.7	349.4	466.5	597.7	802.8	1 111.2	1 656.6	2 301.4	2 464.9	428.4%
Indonesia	94.9	124.0	181.5	228.8	309.8	437.2	453.4	571.2	755.1	988.1	1 037.7	234.9%
Malaysia	22.8	30.4	45.8	58.7	81.8	128.6	162.5	204.9	255.0	330.0	343.9	320.5%
Mongolia	..	..	..	3.2	3.8	3.4	3.8	5.3	7.2	11.7	11.8	206.5%
Myanmar	4.7	5.2	7.1	8.9	8.0	10.6	16.0	29.3	49.5	70.5	75.1	837.6%
Nepal	3.4	3.8	4.2	5.4	6.7	8.6	10.9	12.9	16.0	19.7	19.8	195.2%
Pakistan	27.6	32.2	43.4	60.3	79.9	100.1	117.6	150.0	177.4	215.9	228.3	185.8%
Philippines	47.5	59.6	80.0	75.0	94.5	105.2	125.3	156.9	199.6	266.1	284.5	201.0%
Singapore	15.1	21.3	32.1	44.7	67.6	102.2	134.5	170.7	236.4	289.2	294.9	336.4%
Sri Lanka	9.0	10.6	13.7	17.4	20.6	26.8	34.3	41.6	56.7	76.4	79.7	286.7%
Chinese Taipei	31.5	47.9	82.5	99.4	155.1	222.5	296.7	361.6	446.1	506.1	513.2	230.9%
Thailand	35.9	45.3	66.5	86.7	141.6	210.0	217.7	283.8	341.1	393.7	406.4	187.0%
Viet Nam	15.8	16.0	16.9	23.3	29.5	43.7	61.1	85.4	115.9	154.5	164.1	457.1%
Other non-OECD Asia	21.3	24.7	29.0	31.1	35.1	40.7	43.8	58.5	83.5	102.7	104.2	197.1%
Asia (excl. China)	573.9	697.3	936.9	1 173.0	1 595.2	2 138.8	2 594.4	3 379.2	4 563.3	5 938.8	6 253.8	292.0%
People's Rep. of China	200.0	248.9	341.4	566.2	829.6	1 479.0	2 237.1	3 569.9	6 100.6	8 908.3	9 505.2	+
Hong Kong, China	24.6	31.5	54.3	71.7	104.1	134.8	153.4	188.6	228.6	264.4	269.8	159.2%
China	224.6	280.4	395.7	637.9	933.7	1 613.8	2 390.5	3 758.5	6 329.3	9 172.7	9 775.0	946.9%
Argentina	178.7	197.0	226.3	199.1	194.4	267.0	303.2	333.6	423.6	455.5	445.0	128.9%
Bolivia	6.6	8.3	9.2	8.3	9.3	11.4	13.5	15.7	19.7	25.7	26.8	187.3%
Brazil	499.3	731.6	1 010.4	1 066.4	1 192.7	1 387.3	1 538.7	1 774.8	2 208.9	2 331.9	2 248.1	88.5%
Colombia	64.5	80.2	104.1	116.3	148.1	181.3	192.5	229.9	287.0	359.1	366.2	147.3%
Costa Rica	7.3	9.2	11.9	11.9	15.2	19.8	24.5	29.5	37.3	45.2	47.2	210.3%
Cuba	21.3	25.5	30.0	45.2	44.7	31.0	38.7	49.5	64.3	73.9	77.1	72.3%
Curaçao ¹	1.1	1.2	1.4	1.5	1.7	1.9	2.3	2.5	2.7	1.9	1.9	8.0%
Dominican Republic	8.2	11.4	14.7	16.1	18.5	23.9	33.4	39.7	54.0	69.0	73.6	296.8%
Ecuador	16.0	23.7	29.4	33.2	38.0	44.0	46.5	58.9	69.6	86.6	85.4	124.5%
El Salvador	9.8	11.8	11.8	10.2	11.3	15.3	17.8	20.0	21.4	23.6	24.1	113.0%
Guatemala	11.1	13.8	18.2	17.2	19.9	24.5	29.8	34.6	41.3	49.9	51.4	158.5%
Haiti	4.7	5.0	6.6	6.4	6.3	5.8	6.6	6.4	6.6	7.8	7.9	24.9%
Honduras	3.7	4.3	6.0	6.6	7.7	9.1	10.6	13.3	15.8	18.8	19.5	154.7%
Jamaica	8.8	9.4	7.9	8.1	10.3	12.6	12.3	13.5	13.2	13.6	13.8	33.6%
Nicaragua	5.4	6.7	5.4	5.6	4.7	5.2	6.6	7.7	8.8	11.4	12.0	153.8%
Panama	5.7	6.5	8.7	10.3	9.9	13.0	16.5	20.4	28.9	42.2	44.3	345.7%
Paraguay	3.4	4.5	7.5	8.5	11.3	14.0	14.3	15.7	20.0	25.4	26.4	134.7%
Peru	47.2	59.2	64.7	64.6	58.5	75.5	85.8	105.8	147.5	186.3	193.5	230.8%
Suriname	..	..	..	..	..	..	2.7	3.5	4.4	4.8	4.3	..
Trinidad and Tobago	6.9	7.8	10.2	9.0	8.0	8.6	12.4	18.3	22.2	22.7	21.5	169.6%
Uruguay	15.9	17.2	21.4	17.7	21.4	25.9	29.9	30.2	40.3	47.6	48.3	125.6%
Venezuela	168.5	192.0	216.6	206.8	235.0	278.4	289.0	327.8	393.2	395.2	324.0	37.9%
Other non-OECD Americas	16.5	17.2	22.5	23.4	29.7	31.3	35.0	39.1	40.4	43.5	44.3	49.1%
Non-OECD Americas	1 110.5	1 443.3	1 845.0	1 892.2	2 096.7	2 486.8	2 762.4	3 190.2	3 971.0	4 341.4	4 206.4	100.6%
Bahrain	2.5	4.7	7.6	7.1	8.9	12.4	15.3	19.6	25.7	30.8	31.7	256.1%
Islamic Republic of Iran	184.1	238.9	165.1	201.5	205.5	237.3	281.9	368.5	467.8	456.9	486.8	136.9%
Iraq	15.3	21.7	45.7	40.8	71.3	46.9	101.6	104.2	138.5	190.9	211.9	197.3%
Jordan	3.5	3.4	7.1	9.2	8.7	12.2	14.3	19.5	26.4	30.2	30.8	254.6%
Kuwait	60.9	50.3	53.3	41.5	40.7	66.8	73.4	108.9	115.4	139.7	143.1	252.0%
Lebanon	17.2	16.9	14.4	20.1	11.4	20.3	21.8	26.3	38.0	41.2	41.9	266.8%
Oman	6.7	8.8	11.4	23.2	27.0	35.9	42.4	44.3	58.6	71.7	73.9	173.6%
Qatar	19.3	19.6	22.8	19.2	18.9	21.2	36.0	53.4	125.1	167.0	170.7	803.2%
Saudi Arabia	155.7	251.5	355.7	207.5	293.9	349.4	379.2	461.6	528.2	678.7	690.6	134.9%
Syrian Arab Republic	8.1	13.7	18.9	21.5	24.2	36.2	38.6	47.2	59.9	17.0	15.3	-36.6%
United Arab Emirates	22.1	56.8	118.5	110.5	125.8	151.4	198.2	257.4	289.9	367.6	378.8	201.2%
Yemen	2.8	4.0	7.0	9.9	11.7	15.8	20.3	25.0	30.9	20.8	18.7	59.9%
Middle East	498.3	690.3	827.5	712.0	848.0	1 006.0	1 223.2	1 535.9	1 904.6	2 212.5	2 294.3	170.6%

1. Please refer to the chapter Geographical coverage.

GDP using purchasing power parities

billion 2010 US dollars

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
World	23 774	28 068	34 174	38 638	46 097	51 474	61 739	74 364	89 110	105 887	109 231	137.0%
<i>Annex I Parties</i>	..	..	..	..	30 298.8	31 592.7	36 888.3	41 719.8	44 089.6	48 139.9	48 902.0	61.4%
<i>Annex II Parties</i>	13 766.1	15 521.1	18 442.7	21 012.6	24 980.4	27 575.7	32 359.4	35 832.9	37 186.0	40 221.3	40 852.7	63.5%
<i>North America</i>	5 398.5	6 000.5	7 188.3	8 438.2	9 919.9	11 229.4	13 845.8	15 694.2	16 325.5	18 193.3	18 462.5	86.1%
<i>Europe</i>	6 422.6	7 224.8	8 450.0	9 166.2	10 794.6	11 699.9	13 508.4	14 730.1	15 299.9	16 070.3	16 361.6	51.6%
<i>Asia Oceania</i>	1 945.0	2 295.8	2 804.4	3 408.3	4 265.9	4 646.3	5 005.2	5 408.5	5 560.5	5 957.7	6 028.6	41.3%
<i>Annex I EIT</i>	..	..	..	..	4 704.1	3 295.4	3 646.8	4 775.4	5 601.7	6 099.0	6 171.4	31.2%
<i>Non-Annex I Parties</i>	..	..	..	..	15 798.4	19 881.1	24 850.2	32 644.2	45 020.5	57 747.0	60 328.7	281.9%
<i>Annex B Kyoto Parties</i>	..	..	..	..	13 502.0	14 036.1	16 198.2	18 139.4	19 276.1	20 513.8	20 911.9	54.9%
Non-OECD Total	8 496.9	10 636.0	13 376.4	14 930.5	17 841.1	20 089.8	24 567.7	32 831.7	45 316.8	57 715.6	60 196.6	237.4%
OECD Total	15 277.6	17 431.6	20 797.3	23 707.2	28 256.1	31 384.0	37 170.9	41 532.2	43 793.4	48 171.4	49 034.1	73.5%
Canada	461.3	549.3	659.1	751.7	855.5	930.3	1 132.7	1 286.1	1 361.1	1 520.6	1 542.1	80.3%
Chile	60.9	52.2	74.1	77.4	107.2	162.6	205.3	258.0	310.4	375.7	380.5	255.0%
Mexico	487.2	642.1	886.2	975.5	1 060.0	1 165.8	1 508.2	1 619.5	1 743.2	2 016.1	2 074.8	95.7%
United States	4 937.2	5 451.1	6 529.2	7 686.6	9 064.4	10 299.0	12 713.1	14 408.1	14 964.4	16 672.7	16 920.3	86.7%
OECD Americas	5 946.6	6 694.7	8 148.5	9 491.1	11 087.0	12 557.7	15 559.3	17 571.7	18 379.1	20 585.1	20 917.8	88.7%
Australia	283.8	315.2	365.0	422.4	490.3	574.6	695.2	821.7	942.0	1 084.2	1 105.4	125.5%
Israel ¹	41.3	53.7	62.1	72.5	89.8	124.4	160.9	177.8	219.9	261.6	272.0	202.7%
Japan	1 606.5	1 916.0	2 374.4	2 910.2	3 698.9	3 982.1	4 206.3	4 460.6	4 482.5	4 715.5	4 759.8	28.7%
Korea	88.9	129.1	194.0	303.4	499.1	747.6	976.5	1 230.5	1 505.3	1 745.0	1 796.1	259.9%
New Zealand	54.7	64.5	65.0	75.6	76.7	89.6	103.7	126.2	136.0	158.0	163.4	113.0%
OECD Asia Oceania	2 075.2	2 478.7	3 060.5	3 784.1	4 854.8	5 518.3	6 142.7	6 816.8	7 285.7	7 964.3	8 096.7	66.8%
Austria	137.9	159.1	186.9	201.1	233.5	260.6	301.9	329.6	351.7	371.5	376.9	61.4%
Belgium	182.1	209.2	244.5	256.3	298.4	322.9	372.4	407.4	437.2	458.8	465.3	56.0%
Czech Republic	140.2	160.0	178.0	187.0	202.3	194.6	212.5	257.4	290.4	315.6	323.8	60.0%
Denmark	115.1	121.3	138.3	158.4	170.1	190.8	221.4	236.5	239.0	253.0	258.0	51.7%
Estonia	..	..	..	..	22.1	15.5	20.9	29.4	28.8	34.5	35.2	59.3%
Finland	72.8	88.2	103.0	118.6	140.4	137.3	175.9	199.9	208.2	207.6	212.1	51.1%
France	974.8	1 118.8	1 320.7	1 429.6	1 688.2	1 799.5	2 076.9	2 254.5	2 342.7	2 458.4	2 487.6	47.4%
Germany	1 486.6	1 624.9	1 917.4	2 051.8	2 413.6	2 669.5	2 935.3	3 019.8	3 210.8	3 485.7	3 553.4	47.2%
Greece	133.1	157.7	193.4	194.7	207.1	220.3	263.5	318.9	313.7	256.8	256.2	23.7%
Hungary	100.4	128.7	153.4	167.3	171.8	152.4	176.5	218.1	215.8	237.3	242.6	41.2%
Iceland	3.3	4.0	5.5	6.1	7.2	7.3	9.5	11.6	12.3	14.1	15.1	111.2%
Ireland	33.8	41.6	51.9	58.9	74.1	93.0	145.4	190.7	197.4	281.2	295.7	298.8%
Italy	946.5	1 086.0	1 350.0	1 467.6	1 711.4	1 825.9	2 015.8	2 112.1	2 079.2	2 016.5	2 033.8	18.8%
Latvia	..	..	..	..	35.1	19.8	25.5	37.8	36.9	43.8	44.8	27.7%
Luxembourg	9.7	10.9	12.2	13.7	19.7	25.0	33.3	38.5	43.5	50.1	51.7	162.0%
Netherlands	289.3	327.4	376.9	398.6	469.9	526.3	650.7	695.4	740.8	771.4	788.4	67.8%
Norway	87.4	105.0	131.2	155.5	169.1	203.2	242.8	270.7	284.0	309.5	312.8	84.9%
Poland	286.4	366.3	382.0	385.3	379.4	422.5	545.5	635.0	802.3	930.1	957.7	152.4%
Portugal	98.5	114.4	146.7	153.3	202.0	219.9	268.5	280.3	289.0	276.6	281.1	39.1%
Slovak Republic	52.3	59.7	66.5	71.8	77.0	70.3	83.6	106.9	134.8	152.6	157.7	104.8%
Slovenia	..	..	..	..	36.6	35.5	43.8	52.3	56.9	58.1	59.9	63.7%
Spain	498.7	617.3	680.4	729.2	908.6	979.1	1 196.2	1 413.2	1 489.8	1 475.7	1 524.0	67.7%
Sweden	171.9	193.5	206.8	228.2	256.9	266.2	317.3	361.2	390.8	434.3	448.4	74.5%
Switzerland	227.3	227.4	247.2	266.4	308.0	310.0	347.2	373.5	416.1	451.4	457.6	48.6%
Turkey	253.9	318.8	358.3	454.3	595.4	697.4	852.2	1 076.7	1 262.8	1 779.7	1 836.4	208.4%
United Kingdom	953.8	1 018.2	1 136.9	1 278.1	1 516.5	1 643.2	1 934.5	2 216.3	2 253.9	2 497.8	2 543.7	67.7%
OECD Europe ¹	7 255.8	8 258.2	9 588.3	10 432.0	12 314.3	13 307.9	15 468.9	17 143.7	18 128.6	19 622.0	20 019.6	62.6%
<i>IEA/Accession/Association</i>	17 829.2	20 727.3	25 233.0	29 212.3	35 245.4	41 035.3	49 648.3	58 671.9	69 271.4	82 719.4	85 438.9	142.4%
<i>European Union - 28</i>	..	..	..	..	11 703.0	12 502.9	14 453.3	15 983.5	16 797.8	17 776.8	18 135.6	55.0%
<i>G20</i>	..	..	..	..	37 744.8	42 302.2	50 740.2	60 435.4	71 500.1	85 120.9	87 761.6	132.5%
<i>Africa</i>	1 247.0	1 415.5	1 771.4	1 904.6	2 110.0	2 244.7	2 702.0	3 495.7	4 533.0	5 358.6	5 475.3	159.5%
<i>Americas</i>	7 610.0	8 830.7	10 848.2	12 271.6	14 143.9	16 173.0	19 595.6	22 248.1	24 219.1	27 052.6	27 238.4	92.6%
<i>Asia</i>	5 265.4	6 583.0	8 266.0	9 952.2	13 628.4	17 259.9	21 314.1	27 940.5	38 113.5	49 770.7	52 412.8	284.6%
<i>Europe</i>	7 155.8	8 165.0	9 550.1	10 351.1	15 624.2	15 101.5	17 295.7	19 695.9	21 124.2	22 410.5	22 781.9	45.8%
<i>Oceania</i>	354.0	397.6	450.0	519.3	590.7	694.7	831.2	983.7	1 120.3	1 294.5	1 322.2	123.8%

1. Please refer to the chapter Geographical coverage.

GDP using purchasing power parities

billion 2010 US dollars

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Non-OECD Total	8 496.9	10 636.0	13 376.4	14 930.5	17 841.1	20 089.8	24 567.7	32 831.7	45 316.8	57 715.6	60 196.6	237.4%
Albania	7.7	9.7	12.8	14.2	15.1	13.2	17.0	22.6	28.1	30.7	31.7	110.5%
Armenia	..	..	..	..	13.0	6.9	8.8	15.6	18.9	23.4	23.5	80.9%
Azerbaijan	..	..	..	..	59.7	25.0	35.2	66.2	141.5	157.9	153.0	156.2%
Belarus	..	..	..	..	83.4	54.5	73.9	106.2	151.0	160.2	156.0	87.0%
Bosnia and Herzegovina	..	..	..	..	6.9	6.7	22.8	30.1	34.7	37.0	38.2	456.5%
Bulgaria	34.0	46.3	62.4	73.6	79.3	69.4	71.6	95.0	110.6	119.4	124.1	56.5%
Croatia	..	..	..	..	68.4	56.2	66.5	82.8	84.8	83.2	85.7	25.4%
Cyprus ¹	3.5	4.1	7.2	9.5	13.2	16.9	20.5	24.4	27.6	25.4	26.1	97.5%
FYR of Macedonia	..	..	..	..	19.1	15.1	17.4	19.2	23.4	26.4	27.0	41.3%
Georgia	..	..	..	..	37.7	10.6	14.1	20.1	25.9	32.9	33.8	-10.3%
Gibraltar	0.4	0.4	0.4	0.5	0.6	0.6	0.8	0.9	0.9	1.0	1.1	85.9%
Kazakhstan	..	..	..	..	209.0	128.4	145.1	237.7	321.4	404.3	408.8	95.6%
Kosovo	..	..	..	..	..	..	7.7	11.2	13.7	16.1	16.6	..
Kyrgyzstan	..	..	..	..	14.9	7.6	10.0	12.0	14.9	18.9	19.6	31.2%
Lithuania	..	..	..	..	45.3	32.4	40.7	58.8	62.3	74.8	76.5	68.8%
Malta	1.5	2.2	3.8	4.2	5.6	7.3	9.4	10.4	11.5	14.5	15.3	173.0%
Republic of Moldova	..	..	..	..	23.4	9.4	8.3	11.7	13.6	16.5	17.2	-26.5%
Montenegro	..	..	..	..	..	..	..	7.0	8.5	9.3	9.5	..
Romania	110.3	167.0	240.7	281.0	256.6	230.4	227.5	301.0	347.5	392.2	410.2	59.9%
Russian Federation	..	..	..	..	2 714.9	1 686.5	1 827.2	2 460.4	2 928.1	3 184.0	3 176.8	17.0%
Serbia	..	..	..	..	54.8	53.7	57.2	77.3	88.1	89.7	92.3	68.3%
Tajikistan	..	..	..	..	18.9	7.2	7.2	11.5	15.8	22.1	23.6	25.3%
Turkmenistan	..	..	..	..	30.0	19.0	23.6	30.3	49.6	81.7	86.8	189.2%
Ukraine	..	..	..	..	532.0	255.4	231.1	334.4	351.7	313.4	320.6	-39.7%
Uzbekistan	..	..	..	..	61.7	50.1	60.5	78.7	118.6	174.8	188.4	205.3%
Former Soviet Union	2 016.2	2 521.1	3 079.7	3 427.1	..	..	..	..	..	..	..	..
Former Yugoslavia	126.0	154.7	208.1	211.9	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia	2 299.6	2 905.6	3 615.3	4 021.8	4 363.5	2 762.4	3 004.0	4 125.3	4 992.5	5 509.7	5 562.4	27.5%
Algeria	98.1	146.6	197.8	250.2	259.9	263.2	312.0	401.9	455.5	536.2	553.8	113.1%
Angola	40.4	40.8	40.9	44.7	52.4	41.5	56.5	75.7	135.0	170.1	169.0	222.4%
Benin	3.9	4.3	5.2	6.5	7.1	8.8	11.2	13.6	16.4	20.6	21.4	200.1%
Botswana	..	..	..	6.3	10.9	13.7	17.6	21.1	26.3	33.2	34.7	216.6%
Cameroon	14.3	19.1	26.0	40.7	34.7	31.4	39.0	48.3	57.3	73.6	76.9	121.7%
Congo	4.5	6.1	7.7	12.5	12.3	12.6	14.2	17.3	22.3	27.1	26.6	116.6%
Côte d'Ivoire	23.4	29.2	35.8	36.2	38.4	41.3	48.2	48.2	53.8	73.4	79.5	107.1%
Dem. Rep. of the Congo	40.4	42.9	39.8	43.6	43.4	29.8	24.4	29.4	38.5	56.0	57.4	32.1%
Egypt	106.6	122.3	195.2	270.3	332.4	392.8	506.0	601.9	812.3	927.6	967.5	191.1%
Eritrea	..	..	..	..	..	4.8	5.6	6.3	6.1	8.0	8.3	..
Ethiopia	24.2	24.8	25.4	23.9	30.7	32.3	40.3	55.1	92.3	150.0	161.4	425.3%
Gabon	8.0	16.4	15.2	17.2	18.2	21.2	21.5	23.1	24.7	31.8	32.6	79.0%
Ghana	22.6	21.2	22.2	21.8	27.5	33.9	41.9	53.6	73.5	106.2	110.0	299.8%
Kenya	20.7	27.0	36.6	41.5	54.6	59.1	65.7	78.5	100.3	131.2	138.9	154.5%
Libya	136.7	110.4	174.1	124.3	112.4	108.7	115.0	147.8	179.1	47.0	45.0	-60.0%
Mauritius	2.5	3.4	4.3	5.4	7.7	9.7	12.9	15.0	19.5	23.3	24.2	216.1%
Morocco	38.6	46.5	60.6	74.2	96.2	104.8	128.1	162.6	207.6	252.6	255.7	165.8%
Mozambique	5.6	4.7	4.8	3.8	4.9	5.8	9.9	15.2	21.8	30.7	31.9	548.7%
Namibia	..	..	..	..	..	9.6	11.4	14.5	18.0	23.7	23.9	..
Niger	..	..	..	..	..	..	8.4	10.2	13.1	17.6	18.5	..
Nigeria	224.1	257.2	311.7	270.0	283.9	291.0	341.4	564.8	800.2	1 006.6	990.4	248.8%
Senegal	8.9	10.0	10.6	12.2	13.7	15.1	18.5	23.2	27.6	33.7	35.9	163.1%
South Africa	229.9	263.8	307.2	328.5	356.8	372.5	427.4	515.8	600.8	669.7	671.6	88.2%
South Sudan	..	..	..	..	..	..	..	..	..	21.1	22.0	..
Sudan	25.0	30.8	34.6	35.8	44.3	56.8	76.1	103.7	146.6	162.5	170.1	284.2%
United Rep. of Tanzania	17.7	21.1	24.4	27.3	35.7	39.0	48.2	68.3	91.7	127.7	136.6	282.4%
Togo	3.0	3.6	4.5	4.4	5.0	5.0	6.2	6.6	7.7	9.8	10.3	105.6%
Tunisia	17.3	23.5	31.9	39.2	45.3	54.8	72.0	87.1	108.8	118.7	120.1	165.2%
Zambia	14.5	16.3	16.6	17.0	18.4	18.2	21.7	29.3	44.5	57.2	59.3	221.9%
Zimbabwe	13.6	15.8	17.0	20.9	26.0	27.6	30.9	21.1	20.4	29.6	29.7	14.4%
Other Africa	102.4	108.0	121.3	126.2	137.2	139.8	169.8	236.5	311.4	382.0	392.3	185.9%
Africa	1 247.0	1 415.5	1 771.4	1 904.6	2 110.0	2 244.7	2 702.0	3 495.7	4 533.0	5 358.6	5 475.3	159.5%

1. Please refer to the chapter Geographical coverage.

GDP using purchasing power parities

billion 2010 US dollars

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Bangladesh	78.9	73.7	90.4	111.4	134.0	167.2	211.7	271.2	364.1	494.8	530.0	295.5%
Brunei Darussalam	13.0	15.9	25.8	21.4	21.5	25.1	26.8	29.7	30.7	30.5	29.8	38.6%
Cambodia	..	..	..	..	..	11.5	16.4	25.6	35.4	50.0	53.5	..
DPR of Korea	31.1	48.7	84.0	134.5	160.2	125.8	111.7	108.4	100.6	100.8	101.9	-36.4%
India	658.7	747.3	871.3	1 120.5	1 496.1	1 916.7	2 574.3	3 563.4	5 312.4	7 380.0	7 904.5	428.4%
Indonesia	251.8	329.2	481.8	607.2	822.2	1 160.3	1 203.3	1 515.9	2 004.0	2 622.4	2 753.9	234.9%
Malaysia	51.9	69.3	104.4	133.8	186.5	293.2	370.5	467.0	581.4	752.6	784.3	320.6%
Mongolia	..	..	..	9.1	11.0	9.6	10.9	15.0	20.5	33.3	33.7	207.4%
Myanmar	17.2	19.2	26.0	32.9	29.6	39.3	59.0	108.1	182.9	259.6	274.9	829.5%
Nepal	11.1	12.3	13.9	17.6	22.0	28.3	35.8	42.3	52.6	65.0	65.2	196.5%
Pakistan	111.4	129.7	175.2	243.2	322.3	404.1	474.3	605.2	715.8	871.3	919.0	185.1%
Philippines	122.2	153.4	205.9	193.1	243.4	270.9	322.8	404.0	514.0	685.1	732.5	201.0%
Singapore	23.0	32.2	48.7	67.8	102.5	155.1	204.0	259.0	358.7	438.7	447.4	336.4%
Sri Lanka	26.8	31.5	40.7	51.8	61.3	79.8	102.0	123.9	168.8	227.2	237.2	286.7%
Chinese Taipei	61.4	93.4	160.9	193.9	302.4	433.9	578.6	705.1	870.0	986.9	1 000.8	230.9%
Thailand	93.6	118.0	173.2	225.8	368.7	546.8	566.8	738.8	888.1	1 025.0	1 058.1	187.0%
Viet Nam	52.2	52.8	55.8	76.9	97.1	144.0	201.5	281.3	382.1	509.3	540.9	457.1%
Other non-OECD Asia	45.5	52.4	60.9	64.4	70.3	79.9	86.0	118.6	176.0	222.7	228.3	224.6%
Asia (excl. China)	1 649.7	1 979.0	2 618.8	3 305.3	4 451.1	5 891.6	7 156.5	9 382.5	12 757.9	16 755.3	17 695.9	297.6%
People's Rep. of China	409.4	509.4	698.6	1 158.7	1 697.7	3 026.8	4 578.2	7 305.7	12 485.0	18 230.9	19 450.4	+
Hong Kong, China	35.7	45.6	78.7	103.9	150.8	195.2	222.1	273.2	331.1	382.9	390.7	159.2%
China	445.0	554.9	777.2	1 262.6	1 848.5	3 222.0	4 800.3	7 578.9	12 816.1	18 613.8	19 841.1	973.4%
Argentina	318.9	351.5	403.8	355.1	346.8	476.4	541.0	595.2	755.8	812.6	794.3	129.0%
Bolivia	17.6	22.2	24.6	22.3	24.9	30.4	36.1	42.0	52.5	68.6	71.6	187.3%
Brazil	633.7	928.4	1 282.3	1 353.4	1 513.7	1 760.7	1 952.8	2 252.5	2 803.4	2 959.5	2 853.2	88.5%
Colombia	110.2	137.0	177.9	198.8	253.0	309.7	328.9	392.9	490.4	613.6	625.6	147.3%
Costa Rica	11.4	14.3	18.4	18.4	23.6	30.8	38.0	45.9	57.9	70.3	73.3	210.3%
Cuba	66.1	79.2	93.1	140.3	138.9	96.3	120.3	153.7	199.8	229.5	239.4	72.3%
Curaçao ¹	0.9	1.1	1.2	1.3	1.5	1.7	2.1	2.2	2.4	1.7	1.7	8.0%
Dominican Republic	16.3	22.7	29.3	32.3	37.1	47.9	66.8	79.5	107.9	137.9	147.1	296.8%
Ecuador	31.6	46.6	57.9	65.4	74.8	86.6	91.4	115.8	136.8	170.0	167.3	123.7%
El Salvador	20.1	24.3	24.2	21.1	23.3	31.5	36.6	41.1	44.1	48.5	49.7	113.0%
Guatemala	25.9	32.1	42.4	40.1	46.3	57.1	69.3	80.4	96.2	116.1	119.7	158.5%
Haiti	10.4	11.1	14.6	14.2	14.1	12.9	14.6	14.2	14.7	17.3	17.6	24.9%
Honduras	7.4	8.6	12.1	13.2	15.4	18.3	21.3	26.7	31.9	37.9	39.2	154.7%
Jamaica	14.7	15.7	13.3	13.6	17.3	21.0	20.6	22.6	22.1	22.8	23.1	33.4%
Nicaragua	13.9	17.3	14.0	14.4	12.2	13.3	17.0	19.9	22.6	29.6	31.0	153.8%
Panama	10.8	12.4	16.5	19.6	18.9	24.7	31.4	38.8	55.0	80.4	84.3	345.7%
Paraguay	7.5	9.9	16.7	18.7	24.9	31.0	31.6	34.8	44.4	56.2	58.5	134.6%
Peru	91.7	115.0	125.7	125.4	113.6	146.6	166.6	205.5	286.5	361.8	375.8	230.8%
Suriname	..	..	..	..	..	..	4.5	5.9	7.3	8.0	7.6	..
Trinidad and Tobago	12.6	14.3	18.7	16.4	14.7	15.8	22.8	33.6	40.7	41.7	40.7	177.7%
Uruguay	22.3	24.1	30.1	24.8	30.0	36.4	41.9	42.3	56.5	66.7	67.6	125.6%
Venezuela	201.7	229.8	259.3	247.4	281.2	333.1	345.8	392.3	470.6	472.9	387.8	37.9%
Other non-OECD Americas	17.7	18.4	23.5	24.2	30.6	32.9	34.9	38.8	40.5	44.0	44.6	46.1%
Non-OECD Americas	1 663.5	2 136.0	2 699.7	2 780.5	3 056.9	3 615.2	4 036.3	4 676.4	5 840.0	6 467.5	6 320.6	106.8%
Bahrain	4.8	9.0	14.6	13.6	17.1	23.7	29.3	37.6	49.3	59.0	60.8	256.1%
Islamic Republic of Iran	516.0	669.4	462.7	564.8	606.8	700.7	832.4	1 077.5	1 310.9	1 283.0	1 454.9	139.8%
Iraq	42.4	60.0	126.4	112.8	197.2	129.9	281.1	288.3	383.3	528.3	586.4	197.3%
Jordan	8.8	8.7	18.0	23.2	21.9	30.9	36.2	49.3	66.7	76.2	77.7	254.6%
Kuwait	116.5	96.4	102.0	79.3	77.8	127.9	140.5	208.5	220.9	264.1	273.4	251.4%
Lebanon	31.7	31.1	26.4	37.0	20.8	37.0	39.7	47.9	69.9	76.6	78.1	275.2%
Oman	15.5	20.3	26.3	53.4	62.2	82.8	97.7	102.0	135.1	165.2	170.2	173.6%
Qatar	33.7	34.2	39.7	33.5	33.0	37.0	62.9	93.0	218.2	291.2	297.6	803.1%
Saudi Arabia	359.7	581.2	821.9	479.5	679.2	807.4	876.3	1 066.6	1 220.5	1 568.3	1 595.6	134.9%
Syrian Arab Republic	17.8	30.2	41.8	47.4	53.4	80.0	85.3	104.1	132.3	37.5	33.9	-36.6%
United Arab Emirates	35.5	91.4	190.7	177.9	202.4	243.7	319.1	414.3	466.6	591.7	609.7	201.2%
Yemen	9.4	13.3	23.3	33.3	39.3	53.0	68.2	83.8	103.6	69.6	62.8	59.9%
Middle East	1 192.0	1 645.1	1 893.9	1 655.7	2 011.1	2 353.9	2 868.6	3 573.0	4 377.3	5 010.7	5 301.2	163.6%

1. Please refer to the chapter Geographical coverage.

Population

millions

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
World	3 757.8	4 061.7	4 434.8	4 840.8	5 280.1	5 705.1	6 111.0	6 509.0	6 921.3	7 343.3	7 429.3	40.7%
<i>Annex I Parties</i>	..	..	..	..	1 176.9	1 208.1	1 232.2	1 256.8	1 286.5	1 312.5	1 318.2	12.0%
<i>Annex II Parties</i>	705.6	729.7	755.3	776.2	799.7	827.7	852.7	880.6	908.9	931.4	936.3	17.1%
<i>North America</i>	229.7	239.1	252.2	264.3	277.9	295.9	313.1	328.2	343.8	357.0	359.7	29.4%
<i>Europe</i>	354.9	361.7	368.0	371.6	377.6	384.4	389.6	400.0	410.4	418.5	420.5	11.3%
<i>Asia Oceania</i>	121.0	128.8	135.0	140.2	144.3	147.4	150.0	152.4	154.7	155.9	156.2	8.3%
<i>Annex I EIT</i>	..	..	..	..	321.1	319.7	314.2	306.5	303.3	302.5	302.3	-5.8%
<i>Non-Annex I Parties</i>	..	..	..	..	4 103.2	4 496.9	4 878.8	5 252.2	5 634.8	6 030.8	6 111.1	48.9%
<i>Annex B Kyoto Parties</i>	..	..	..	..	585.0	590.8	592.5	599.7	610.8	619.8	622.0	6.3%
Non-OECD Total	2 859.4	3 122.6	3 449.9	3 815.1	4 207.1	4 587.9	4 954.5	5 311.8	5 680.9	6 066.4	6 144.8	46.1%
OECD Total	898.4	939.0	984.9	1 025.7	1 072.9	1 117.2	1 156.5	1 197.2	1 240.4	1 276.9	1 284.5	19.7%
Canada	22.0	23.1	24.5	25.8	27.7	29.3	30.7	32.2	34.0	35.8	36.3	31.0%
Chile	9.7	10.4	11.2	12.1	13.2	14.4	15.4	16.3	17.1	18.0	18.3	38.7%
Mexico	53.4	60.8	70.4	78.8	87.1	94.5	100.9	107.2	114.3	121.0	122.3	40.4%
United States	207.7	216.0	227.7	238.5	250.2	266.6	282.4	296.0	309.8	321.2	323.4	29.3%
OECD Americas	292.8	310.3	333.8	355.2	378.1	404.8	429.4	451.7	475.2	496.1	500.2	32.3%
Australia	13.2	14.0	14.8	15.9	17.3	18.2	19.3	20.5	22.3	24.1	24.5	41.9%
Israel ¹	3.0	3.5	3.9	4.2	4.7	5.5	6.3	7.0	7.6	8.4	8.5	83.3%
Japan	105.0	111.8	117.1	121.0	123.6	125.4	126.8	127.8	128.0	127.1	127.0	2.7%
Korea	32.9	35.3	38.1	40.8	42.9	45.1	47.0	48.2	49.6	51.0	51.2	19.5%
New Zealand	2.9	3.1	3.1	3.3	3.4	3.7	3.9	4.1	4.4	4.6	4.7	39.9%
OECD Asia Oceania	157.0	167.6	177.0	185.3	191.8	198.0	203.3	207.5	211.9	215.3	216.0	12.6%
Austria	7.5	7.6	7.5	7.6	7.7	7.9	8.0	8.2	8.4	8.6	8.7	13.8%
Belgium	9.7	9.8	9.9	9.9	10.0	10.1	10.3	10.5	10.9	11.2	11.3	13.3%
Czech Republic	9.8	10.1	10.3	10.3	10.4	10.3	10.3	10.2	10.5	10.5	10.6	1.9%
Denmark	5.0	5.1	5.1	5.1	5.1	5.2	5.3	5.4	5.5	5.7	5.7	11.5%
Estonia	..	..	..	..	1.6	1.4	1.4	1.4	1.3	1.3	1.3	-17.1%
Finland	4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.2	5.4	5.5	5.5	10.2%
France	52.4	53.9	55.2	56.6	58.2	59.5	60.9	63.1	65.0	66.6	66.9	14.8%
Germany	78.3	78.7	78.3	77.7	79.4	81.3	81.5	81.3	80.3	81.7	82.3	3.8%
Greece	8.9	9.1	9.7	10.0	10.3	10.6	10.8	11.0	11.1	10.8	10.8	5.0%
Hungary	10.4	10.5	10.7	10.6	10.4	10.3	10.2	10.1	10.0	9.8	9.8	-5.3%
Iceland	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	31.4%
Ireland	3.0	3.2	3.4	3.5	3.5	3.6	3.8	4.2	4.6	4.6	4.7	33.6%
Italy	54.1	55.4	56.4	56.6	56.7	56.8	56.9	58.2	59.8	60.7	60.6	6.9%
Latvia	..	..	..	..	2.7	2.5	2.4	2.2	2.1	2.0	2.0	-26.5%
Luxembourg	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.6	52.9%
Netherlands	13.2	13.7	14.1	14.5	14.9	15.5	15.9	16.3	16.6	16.9	17.0	13.9%
Norway	3.9	4.0	4.1	4.2	4.2	4.4	4.5	4.6	4.9	5.2	5.2	23.5%
Poland	32.8	34.0	35.6	37.2	38.0	38.3	38.3	38.2	38.5	38.5	38.4	1.0%
Portugal	8.7	9.2	9.9	10.1	10.0	10.0	10.3	10.5	10.6	10.4	10.3	3.3%
Slovak Republic	4.6	4.7	5.0	5.2	5.3	5.4	5.4	5.4	5.4	5.4	5.4	2.5%
Slovenia	..	..	..	..	2.0	2.0	2.0	2.0	2.0	2.1	2.1	3.4%
Spain	34.6	36.0	38.0	38.9	39.3	39.7	40.6	43.7	46.6	46.4	46.5	18.1%
Sweden	8.1	8.2	8.3	8.4	8.6	8.8	8.9	9.0	9.4	9.8	9.9	16.1%
Switzerland	6.3	6.4	6.4	6.5	6.8	7.1	7.2	7.5	7.9	8.3	8.4	23.2%
Turkey	36.2	40.1	44.4	50.3	55.1	59.8	64.3	68.6	73.0	77.4	78.2	42.0%
United Kingdom	55.9	56.2	56.3	56.6	57.2	58.0	58.9	60.4	62.8	65.1	65.6	14.7%
OECD Europe ¹	448.6	461.1	474.1	485.2	503.0	514.4	523.8	538.0	553.3	565.5	568.3	13.0%
<i>IEA/Accession/Association</i>	2 628.0	2 834.6	3 067.7	3 310.7	3 571.1	3 816.1	4 044.8	4 254.5	4 455.3	4 638.5	4 675.2	30.9%
<i>European Union - 28</i>	..	..	..	..	477.9	483.3	487.1	494.9	503.7	509.7	511.3	7.0%
<i>G20</i>	..	..	..	..	3 657.7	3 896.5	4 117.0	4 317.7	4 512.2	4 693.2	4 729.5	29.3%
<i>Africa</i>	373.7	415.2	476.7	549.0	630.4	721.9	816.3	922.9	1 048.1	1 193.7	1 224.6	94.3%
<i>Americas</i>	521.6	561.0	613.9	667.0	721.5	779.2	834.0	884.5	934.2	980.6	989.7	37.2%
<i>Asia</i>	2 135.4	2 337.0	2 571.8	2 831.5	3 178.8	3 447.7	3 703.2	3 939.2	4 166.5	4 386.5	4 430.1	39.4%
<i>Europe</i>	443.9	453.8	463.8	470.0	472.6	472.5	472.6	472.9	473.1	474.0	474.8	3.1%
<i>Oceania</i>	20.0	21.4	22.8	24.7	26.9	28.9	30.9	33.3	36.4	39.4	40.1	49.3%

1. Please refer to the chapter Geographical coverage.

Population

millions

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Non-OECD Total	2 859.4	3 122.6	3 449.9	3 815.1	4 207.1	4 587.9	4 954.5	5 311.8	5 680.9	6 066.4	6 144.8	46.1%
Albania	2.2	2.4	2.7	3.0	3.3	3.2	3.1	3.0	2.9	2.9	2.9	-12.5%
Armenia	..	..	..	..	3.5	3.2	3.1	3.0	2.9	2.9	2.9	-17.3%
Azerbaijan	..	..	..	..	7.2	7.7	8.0	8.4	9.1	9.6	9.8	36.4%
Belarus	..	..	..	..	10.2	10.2	10.0	9.7	9.5	9.5	9.5	-6.7%
Bosnia and Herzegovina	..	..	..	..	4.5	3.8	3.8	3.8	3.7	3.5	3.5	-21.2%
Bulgaria	8.5	8.7	8.9	9.0	8.7	8.4	8.2	7.7	7.4	7.2	7.1	-18.2%
Croatia	..	..	..	..	4.8	4.7	4.4	4.4	4.4	4.2	4.2	-12.7%
Cyprus ¹	0.6	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.8	48.0%
FYR of Macedonia	..	..	..	..	2.0	2.0	2.0	2.1	2.1	2.1	2.1	4.3%
Georgia	..	..	..	..	4.8	4.7	4.4	4.2	3.9	3.7	3.7	-22.6%
Gibraltar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.4%
Kazakhstan	..	..	..	..	16.3	15.8	14.9	15.1	16.3	17.5	17.8	8.9%
Kosovo	..	..	..	..	..	..	1.7	1.7	1.8	1.8	1.8	..
Kyrgyzstan	..	..	..	..	4.4	4.6	4.9	5.2	5.4	6.0	6.1	38.5%
Lithuania	..	..	..	..	3.7	3.6	3.5	3.3	3.1	2.9	2.9	-22.3%
Malta	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	23.4%
Republic of Moldova	..	..	..	..	3.7	3.7	3.6	3.6	3.6	3.6	3.6	-3.9%
Montenegro	..	..	..	..	..	..	..	0.6	0.6	0.6	0.6	..
Romania	20.5	21.3	22.2	22.8	23.2	22.7	22.4	21.3	20.2	19.8	19.7	-15.1%
Russian Federation	..	..	..	..	148.3	148.4	146.6	143.5	142.8	144.1	144.3	-2.7%
Serbia	..	..	..	..	10.1	10.3	8.1	7.4	7.3	7.1	7.1	-29.8%
Tajikistan	..	..	..	..	5.3	5.8	6.2	6.9	7.6	8.5	8.7	65.3%
Turkmenistan	..	..	..	..	3.7	4.2	4.5	4.8	5.1	5.6	5.7	53.7%
Ukraine	..	..	..	..	51.9	51.5	49.2	47.1	45.9	45.2	45.0	-13.3%
Uzbekistan	..	..	..	..	20.5	22.8	24.7	26.2	28.6	31.3	31.8	55.3%
Former Soviet Union	243.2	252.6	264.0	276.0	..	..	..	..	..	..	..	..
Former Yugoslavia	20.0	20.8	21.8	22.6	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia	295.4	306.6	320.4	334.2	340.9	342.2	338.5	334.1	335.5	340.9	342.1	0.3%
Algeria	15.0	16.7	19.3	22.6	25.9	28.9	31.2	33.3	36.1	39.9	40.6	56.7%
Angola	6.9	7.7	8.9	10.6	12.2	14.3	16.4	19.6	23.4	27.9	28.8	136.7%
Benin	3.0	3.3	3.7	4.3	5.0	5.9	6.9	8.0	9.2	10.6	10.9	118.4%
Botswana	..	..	..	1.2	1.4	1.6	1.7	1.9	2.0	2.2	2.3	63.3%
Cameroon	6.7	7.5	8.6	10.1	11.7	13.5	15.3	17.4	20.0	22.8	23.4	100.1%
Congo	1.4	1.6	1.8	2.1	2.4	2.8	3.2	3.7	4.4	5.0	5.1	110.1%
Côte d'Ivoire	5.5	6.6	8.3	10.2	12.3	14.5	16.7	18.3	20.4	23.1	23.7	93.2%
Dem. Rep. of the Congo	20.6	22.9	26.4	29.9	34.6	41.6	47.1	54.8	64.5	76.2	78.7	127.5%
Egypt	35.9	39.2	44.1	50.2	57.4	63.7	69.9	76.8	84.1	93.8	95.7	66.7%
Eritrea	..	..	..	..	..	3.1	3.4	4.0	4.4	5.3	5.5	..
Ethiopia	29.2	32.6	35.3	40.8	48.1	57.3	66.5	76.7	87.7	99.9	102.4	113.0%
Gabon	0.6	0.7	0.7	0.8	1.0	1.1	1.2	1.4	1.6	1.9	2.0	108.0%
Ghana	8.8	9.8	10.8	12.7	14.6	16.8	18.9	21.5	24.5	27.6	28.2	92.8%
Kenya	11.7	13.5	16.3	19.7	23.4	27.3	31.5	36.0	41.4	47.2	48.5	107.1%
Libya	2.2	2.6	3.2	3.9	4.4	4.9	5.4	5.8	6.2	6.2	6.3	41.8%
Mauritius	0.8	0.9	1.0	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.3	19.3%
Morocco	16.3	17.8	20.0	22.5	24.9	27.1	28.9	30.5	32.4	34.8	35.3	41.8%
Mozambique	9.4	10.3	11.8	13.0	13.2	15.8	18.1	20.9	24.2	28.0	28.8	117.6%
Namibia	..	..	..	..	..	1.7	1.9	2.0	2.2	2.4	2.5	..
Niger	..	..	..	..	..	..	11.4	13.6	16.4	19.9	20.7	..
Nigeria	57.3	63.4	73.5	83.6	95.3	108.0	122.4	138.9	158.6	181.2	186.0	95.2%
Senegal	4.4	4.9	5.6	6.5	7.6	8.7	9.9	11.3	12.9	15.0	15.4	104.0%
South Africa	23.1	25.7	29.1	33.0	36.8	41.4	44.9	47.6	51.0	55.0	55.9	52.0%
South Sudan	..	..	..	..	..	..	..	..	..	11.9	12.2	..
Sudan	14.4	16.3	19.2	22.7	25.9	29.6	34.0	39.0	44.5	38.6	39.6	52.7%
United Rep. of Tanzania	14.0	16.0	18.7	21.8	25.5	30.0	34.2	39.4	46.1	53.9	55.6	118.3%
Togo	2.2	2.4	2.7	3.3	3.8	4.3	5.0	5.7	6.5	7.4	7.6	100.8%
Tunisia	5.2	5.7	6.4	7.3	8.2	9.1	9.7	10.1	10.6	11.3	11.4	38.5%
Zambia	4.3	5.0	5.9	7.0	8.0	9.1	10.5	12.1	13.9	16.1	16.6	106.7%
Zimbabwe	5.4	6.1	7.2	8.7	10.2	11.3	12.2	12.9	14.1	15.8	16.2	58.6%
Other Africa	69.5	76.2	88.2	99.7	115.6	127.4	136.9	158.4	183.7	211.6	217.7	88.4%
Africa	373.7	415.2	476.7	549.0	630.4	721.9	816.3	922.9	1 048.1	1 193.7	1 224.6	94.3%

1. Please refer to the chapter Geographical coverage.

Population

millions

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Bangladesh	66.4	71.3	81.5	93.2	106.2	118.7	131.6	143.4	152.1	161.2	163.0	53.5%
Brunei Darussalam	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	63.3%
Cambodia	..	..	..	..	..	10.7	12.2	13.3	14.3	15.5	15.8	..
DPR of Korea	14.8	16.3	17.5	18.9	20.3	21.9	22.9	23.9	24.6	25.2	25.4	25.0%
India	566.2	621.3	696.8	781.7	870.1	960.5	1 053.1	1 144.1	1 231.0	1 309.1	1 324.2	52.2%
Indonesia	117.9	130.7	147.5	165.0	181.4	197.0	211.5	226.7	242.5	258.2	261.1	43.9%
Malaysia	11.1	12.2	13.8	15.6	18.0	20.5	23.2	25.7	28.1	30.7	31.2	72.9%
Mongolia	..	..	..	1.9	2.2	2.3	2.4	2.5	2.7	3.0	3.0	38.6%
Myanmar	27.0	29.7	33.4	37.2	40.6	43.2	46.1	48.5	50.2	52.4	52.9	30.2%
Nepal	12.2	13.3	14.9	16.7	18.7	21.4	23.7	25.6	27.0	28.7	29.0	54.6%
Pakistan	59.7	66.8	78.1	92.2	107.7	122.8	138.5	153.9	170.6	189.4	193.2	79.4%
Philippines	36.9	41.3	47.4	54.3	61.9	69.8	78.0	86.3	93.7	101.7	103.3	66.8%
Singapore	2.1	2.3	2.4	2.7	3.0	3.5	4.0	4.3	5.1	5.5	5.6	84.0%
Sri Lanka	12.7	13.5	14.7	15.8	17.1	18.1	18.7	19.4	20.1	21.0	21.2	24.2%
Chinese Taipei	14.9	16.1	17.8	19.2	20.2	21.2	21.9	22.7	23.2	23.4	23.5	16.0%
Thailand	38.0	42.3	47.4	52.0	56.6	59.5	63.0	65.4	67.2	68.7	68.9	21.7%
Viet Nam	43.7	48.0	53.7	58.9	66.0	72.0	77.6	82.4	86.9	91.7	92.7	40.4%
Other non-OECD Asia	27.8	30.3	31.2	30.3	33.5	30.9	35.4	42.0	47.5	54.1	55.4	65.1%
Asia (excl. China)	1 051.6	1 155.6	1 298.2	1 456.0	1 624.0	1 794.2	1 964.1	2 130.5	2 287.2	2 439.8	2 469.6	52.1%
People's Rep. of China	841.1	916.4	981.2	1 051.0	1 135.2	1 204.9	1 262.6	1 303.7	1 337.7	1 371.2	1 378.7	21.4%
Hong Kong, China	4.0	4.5	5.1	5.5	5.7	6.2	6.7	6.8	7.0	7.3	7.3	28.8%
China	845.2	920.9	986.3	1 056.5	1 140.9	1 211.0	1 269.3	1 310.5	1 344.7	1 378.5	1 386.0	21.5%
Argentina	24.4	26.1	28.1	30.4	32.7	35.0	37.1	39.1	41.2	43.4	43.8	34.0%
Bolivia	4.6	5.0	5.6	6.2	6.9	7.6	8.3	9.1	9.9	10.7	10.9	58.8%
Brazil	97.7	107.6	121.2	135.7	149.4	162.3	175.3	186.9	196.8	206.0	207.7	39.0%
Colombia	22.6	24.8	27.7	31.0	34.3	37.4	40.4	43.3	45.9	48.2	48.7	42.0%
Costa Rica	1.9	2.1	2.4	2.7	3.1	3.5	3.9	4.2	4.5	4.8	4.9	56.9%
Cuba	8.9	9.4	9.8	10.1	10.6	10.9	11.2	11.3	11.3	11.5	11.5	8.4%
Curaçao ¹	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	-15.3%
Dominican Republic	4.6	5.2	5.8	6.5	7.2	7.9	8.6	9.2	9.9	10.5	10.6	48.2%
Ecuador	6.2	7.0	8.0	9.0	10.2	11.4	12.6	13.7	14.9	16.1	16.4	60.4%
El Salvador	3.8	4.1	4.6	4.9	5.3	5.6	5.9	6.0	6.2	6.3	6.3	20.7%
Guatemala	5.8	6.4	7.3	8.2	9.3	10.4	11.7	13.1	14.6	16.3	16.6	79.0%
Haiti	4.8	5.1	5.7	6.4	7.1	7.8	8.5	9.3	10.0	10.7	10.8	52.8%
Honduras	2.8	3.2	3.7	4.3	5.0	5.7	6.5	7.4	8.2	9.0	9.1	83.9%
Jamaica	1.9	2.0	2.2	2.3	2.4	2.5	2.7	2.7	2.8	2.9	2.9	18.9%
Nicaragua	2.5	2.8	3.3	3.7	4.1	4.6	5.0	5.4	5.7	6.1	6.2	48.4%
Panama	1.6	1.7	2.0	2.2	2.5	2.7	3.0	3.3	3.6	4.0	4.0	63.3%
Paraguay	2.5	2.8	3.2	3.7	4.2	4.8	5.3	5.8	6.2	6.6	6.7	59.6%
Peru	13.7	15.2	17.4	19.5	21.8	24.0	25.9	27.6	29.4	31.4	31.8	45.6%
Suriname	..	..	..	..	..	..	0.5	0.5	0.5	0.6	0.6	..
Trinidad and Tobago	1.0	1.0	1.1	1.2	1.2	1.3	1.3	1.3	1.3	1.4	1.4	11.7%
Uruguay	2.8	2.8	2.9	3.0	3.1	3.2	3.3	3.3	3.4	3.4	3.4	10.7%
Venezuela	11.9	13.4	15.3	17.5	19.9	22.2	24.5	26.8	29.0	31.2	31.6	58.9%
Other non-OECD Americas	2.6	2.7	2.8	2.9	3.0	3.2	3.0	3.1	3.3	3.5	3.5	15.7%
Non-OECD Americas	228.8	250.7	280.1	311.7	343.4	374.4	404.6	432.8	459.1	484.6	489.5	42.6%
Bahrain	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.9	1.2	1.4	1.4	187.3%
Islamic Republic of Iran	29.3	32.7	38.7	47.3	56.2	60.6	66.1	70.4	74.6	79.4	80.3	42.8%
Iraq	10.3	11.7	13.7	15.6	17.5	20.2	23.6	27.0	30.8	36.1	37.2	113.0%
Jordan	1.8	2.1	2.4	2.9	3.6	4.6	5.1	5.7	7.2	9.2	9.5	165.5%
Kuwait	0.8	1.0	1.4	1.7	2.1	1.6	2.1	2.3	3.0	3.9	4.1	93.0%
Lebanon	2.4	2.6	2.6	2.7	2.7	3.0	3.2	4.0	4.3	5.9	6.0	122.2%
Oman	0.7	0.9	1.2	1.5	1.8	2.2	2.3	2.5	3.0	4.2	4.4	144.2%
Qatar	0.1	0.2	0.2	0.4	0.5	0.5	0.6	0.9	1.8	2.5	2.6	439.9%
Saudi Arabia	6.1	7.4	9.7	13.2	16.3	18.7	20.8	23.9	27.4	31.6	32.3	97.7%
Syrian Arab Republic	6.6	7.5	8.9	10.6	12.4	14.3	16.4	18.3	21.0	18.7	18.4	48.1%
United Arab Emirates	0.3	0.6	1.0	1.4	1.9	2.4	3.2	4.6	8.3	9.2	9.3	398.4%
Yemen	6.3	6.8	8.1	9.8	12.1	15.3	17.9	20.6	23.6	26.9	27.6	128.8%
Middle East	64.8	73.7	88.2	107.6	127.5	144.1	161.8	181.0	206.2	228.8	233.0	82.7%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions / TPEStonnes CO₂ / terajoule

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
World ¹	70.4	70.9	69.7	67.7	55.9	55.4	55.3	56.2	56.6	56.4	56.1	0.4%
<i>Annex I Parties</i>	..	..	..	..	58.7	56.5	56.3	55.2	53.8	52.1	51.6	-12.1%
<i>Annex II Parties</i>	65.8	63.9	61.5	58.9	57.5	55.6	55.9	55.0	53.6	52.1	51.8	-9.9%
<i>North America</i>	64.0	62.1	60.0	59.6	58.7	57.3	59.0	57.5	56.6	52.8	52.5	-10.6%
<i>Europe</i>	68.7	65.8	63.7	57.7	55.1	52.4	50.7	49.8	47.3	45.6	45.1	-18.1%
<i>Asia Oceania</i>	66.5	66.8	61.7	59.1	58.6	56.5	55.3	57.5	56.4	64.8	65.1	11.0%
<i>Annex I EIT</i>	..	..	..	..	61.8	60.0	57.9	55.4	54.1	51.2	49.8	-19.4%
<i>Non-Annex I Parties</i>	..	..	..	..	49.3	52.2	52.4	56.4	58.0	58.6	58.5	18.4%
<i>Annex B Kyoto Parties</i>	..	..	..	..	59.8	56.4	54.2	53.3	51.5	50.0	49.8	-16.7%
Non-OECD Total	81.6	86.7	86.3	82.1	52.5	53.1	52.7	56.1	57.4	57.9	57.5	9.7%
OECD Total	66.2	64.4	62.1	59.9	58.0	56.3	56.4	55.3	54.3	52.8	52.5	-9.6%
Canada	57.5	54.3	52.5	48.7	47.4	45.9	48.6	47.2	48.1	46.1	46.1	-2.8%
Chile	57.7	53.5	53.9	48.9	50.2	48.3	46.1	45.8	53.1	54.6	53.9	7.4%
Mexico	52.1	54.3	51.4	53.0	49.6	52.8	57.0	54.5	58.9	57.2	57.5	15.8%
United States	64.5	62.9	60.8	60.8	59.9	58.6	60.2	58.7	57.7	53.7	53.3	-11.1%
OECD Americas	63.6	61.8	59.6	59.2	58.1	57.0	58.8	57.2	56.8	53.2	52.8	-9.1%
Australia	66.3	71.0	70.9	72.1	72.0	73.7	73.9	78.3	73.0	72.4	72.2	0.3%
Israel ²	57.3	55.8	57.6	76.7	68.4	69.1	71.8	76.1	70.4	67.8	66.4	-2.9%
Japan	67.0	66.5	60.4	57.0	56.5	53.8	51.9	53.3	52.8	63.9	64.4	13.9%
Korea	74.5	75.9	72.7	70.0	59.6	59.0	54.8	52.0	52.6	51.0	49.8	-16.4%
New Zealand	47.2	45.9	43.8	40.3	40.5	38.4	40.5	47.6	39.5	36.2	34.6	-14.5%
OECD Asia Oceania	66.8	67.2	62.6	60.5	58.9	57.2	55.6	56.6	55.8	60.5	60.2	2.2%
Austria	61.7	58.7	56.1	54.5	54.0	53.0	51.6	53.1	48.5	45.3	45.1	-16.5%
Belgium	71.1	65.2	64.1	54.7	53.0	49.9	46.8	44.1	41.2	41.5	38.7	-26.9%
Czech Republic	80.8	84.8	85.4	85.0	72.0	70.5	70.2	62.5	59.6	56.6	58.3	-19.1%
Denmark	71.5	72.0	78.7	75.5	70.1	71.9	65.1	61.3	57.9	47.2	48.3	-31.1%
Estonia	..	..	..	..	87.2	73.4	73.2	76.7	78.8	66.0	70.8	-18.8%
Finland	52.4	53.6	53.3	44.6	45.3	46.0	40.3	38.1	40.5	31.1	32.0	-29.4%
France	63.8	61.3	56.7	41.2	36.9	34.7	34.6	32.6	30.9	28.1	28.6	-22.3%
Germany	76.6	74.2	70.1	67.2	63.9	60.8	57.6	55.7	55.5	56.6	56.3	-11.9%
Greece	68.9	69.3	72.0	74.1	77.8	80.5	77.5	75.1	72.1	66.5	66.5	-14.6%
Hungary	75.6	73.2	69.6	64.0	54.5	52.0	50.9	46.6	42.5	40.5	40.9	-24.9%
Iceland	37.2	34.9	27.9	22.0	19.9	21.2	16.5	17.1	8.6	8.8	9.3	-53.2%
Ireland	76.9	76.0	75.1	73.2	72.6	73.2	70.8	72.9	65.6	63.6	63.2	-12.9%
Italy	65.6	64.9	64.9	63.2	63.5	60.2	58.5	58.5	53.9	51.6	51.5	-18.8%
Latvia	..	..	..	..	56.8	46.3	42.6	40.0	42.9	38.4	38.2	-32.8%
Luxembourg	96.9	80.7	83.5	80.6	75.7	62.4	57.5	62.5	60.2	56.4	54.9	-27.6%
Netherlands	59.9	53.4	54.0	54.5	52.5	52.9	51.2	49.0	48.2	50.7	50.3	-4.2%
Norway	41.2	38.5	35.4	31.6	31.1	31.9	29.1	30.7	31.2	30.3	31.1	0.0%
Poland	79.7	78.6	78.5	80.9	79.9	80.0	77.9	76.8	73.1	71.1	70.5	-11.7%
Portugal	54.8	56.0	56.8	52.1	53.9	55.9	56.2	55.4	48.3	51.0	51.1	-5.2%
Slovak Republic	65.1	61.4	67.2	62.7	61.4	55.4	49.6	47.3	46.3	42.9	43.7	-28.7%
Slovenia	..	..	..	..	56.6	55.4	52.3	50.6	50.4	46.6	47.8	-15.6%
Spain	66.8	64.7	65.7	58.3	53.7	54.1	54.6	56.2	49.0	49.6	47.6	-11.5%
Sweden	54.4	48.4	43.1	29.5	26.4	27.0	26.1	22.7	21.6	19.5	18.4	-30.0%
Switzerland	56.7	51.1	46.8	45.2	40.0	41.1	40.1	40.5	39.4	36.3	37.9	-5.1%
Turkey	51.0	53.2	54.3	57.9	59.8	60.4	63.0	61.4	60.5	59.2	59.2	-1.0%
United Kingdom	71.1	69.0	68.7	64.7	63.7	56.7	55.8	57.0	55.9	51.7	49.6	-22.2%
OECD Europe	69.7	67.3	65.6	60.7	57.6	54.8	53.1	51.9	49.8	48.3	48.0	-16.6%
<i>IEA/Accession/Association</i>	61.7	60.4	58.8	57.0	55.8	56.2	56.4	57.7	58.5	58.6	58.4	4.6%
<i>European Union - 28</i>	..	..	..	..	58.4	55.2	53.3	52.1	49.9	48.2	47.7	-18.4%
<i>G20</i>	..	..	..	..	56.8	56.7	56.7	58.0	58.5	58.4	58.1	2.4%
<i>Africa</i>	31.0	34.8	34.5	32.7	32.3	31.1	31.6	34.5	34.0	34.2	33.8	4.8%
<i>Americas</i>	61.6	59.8	57.7	56.7	55.9	55.1	56.8	55.2	54.1	51.3	50.9	-8.9%
<i>Asia</i>	48.8	50.9	51.9	52.4	54.1	56.8	56.3	60.5	62.1	63.5	63.4	17.2%
<i>Europe</i>	69.9	67.6	65.8	61.0	58.9	55.9	53.9	52.3	50.4	48.4	47.5	-19.3%
<i>Oceania</i>	63.3	67.0	66.9	67.0	66.9	67.7	68.5	73.5	68.2	66.7	66.5	-0.5%

1. The ratio for the world has been calculated to include international marine bunkers and international aviation bunkers.

2. Please refer to the chapter Geographical coverage.

CO₂ emissions / TPEStonnes CO₂ / terajoule

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Non-OECD Total	81.6	86.7	86.3	82.1	52.5	53.1	52.7	56.1	57.4	57.9	57.5	9.7%
Albania	53.7	52.1	53.0	60.9	50.7	33.2	41.1	42.2	44.2	41.7	39.0	-23.2%
Armenia	..	..	..	..	61.5	48.9	40.6	39.3	38.9	36.6	38.5	-37.5%
Azerbaijan	..	..	..	..	56.4	55.6	57.7	51.6	48.5	51.2	52.7	-6.4%
Belarus	..	..	..	..	52.4	54.8	50.4	48.9	51.7	49.9	50.6	-3.3%
Bosnia and Herzegovina	..	..	..	..	81.6	52.4	75.4	75.1	75.5	74.4	77.7	-4.8%
Bulgaria	80.1	75.3	71.5	64.1	63.1	54.5	54.1	55.8	59.3	56.2	53.3	-15.6%
Croatia	..	..	..	..	51.3	45.2	47.8	48.8	46.4	44.1	44.7	-12.8%
Cyprus ¹	71.0	70.1	71.1	71.8	68.1	71.1	70.5	75.9	71.0	70.0	69.6	2.3%
FYR of Macedonia	..	..	..	..	82.8	79.4	76.3	74.7	69.2	64.4	62.0	-25.2%
Georgia	..	..	..	..	64.4	52.2	38.6	34.2	38.2	43.2	43.9	-31.9%
Gibraltar	55.4	47.4	68.8	59.3	59.3	64.0	63.5	64.2	65.5	66.4	66.5	12.2%
Kazakhstan	..	..	..	..	77.1	78.0	75.0	73.7	76.4	68.8	67.3	-12.8%
Kosovo	..	..	..	..	..	..	78.9	81.5	83.2	81.7	80.5	..
Kyrgyzstan	..	..	..	..	72.6	44.7	45.8	45.4	52.4	59.3	57.5	-20.8%
Lithuania	..	..	..	..	47.9	36.8	34.2	33.6	41.7	35.7	35.5	-25.9%
Malta	74.3	74.3	74.5	80.3	79.6	80.1	75.3	73.9	73.6	61.2	53.8	-32.4%
Republic of Moldova	..	..	..	..	73.7	60.2	54.1	52.9	49.2	48.8	48.5	-34.3%
Montenegro	..	..	..	..	..	..	..	46.9	54.7	55.8	52.1	..
Romania	65.0	64.8	64.9	64.3	64.6	60.3	56.8	57.3	50.9	52.1	51.1	-20.9%
Russian Federation	..	..	..	..	58.8	58.1	56.9	54.3	53.0	49.3	46.9	-20.2%
Serbia	..	..	..	..	75.0	77.1	74.7	73.6	70.1	72.0	71.1	-5.2%
Tajikistan	..	..	..	..	49.6	26.4	24.2	24.0	25.3	36.5	39.5	-20.3%
Turkmenistan	..	..	..	..	60.9	58.0	58.8	59.9	59.9	59.7	59.7	-1.9%
Ukraine	..	..	..	..	65.3	57.8	52.7	49.1	48.0	48.2	50.0	-23.3%
Uzbekistan	..	..	..	..	59.2	52.8	53.5	54.3	53.9	54.3	54.2	-8.4%
Former Soviet Union	..	..	..	..	..	..	..	..	..	..	..	..
Former Yugoslavia	..	..	..	..	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia	820.4	851.3	803.2	831.1	61.2	58.6	56.6	54.7	54.3	51.7	50.1	-18.1%
Algeria	59.3	58.6	59.1	56.6	55.1	54.5	54.4	57.1	56.9	57.4	56.7	3.0%
Angola	10.0	11.3	13.9	13.5	15.9	14.7	15.4	17.7	28.2	27.6	28.6	79.6%
Benin	6.6	8.9	7.0	7.3	3.7	2.9	17.2	25.6	29.5	29.7	30.5	728.8%
Botswana	..	..	..	41.6	55.0	52.6	53.7	54.8	36.4	62.4	63.7	15.7%
Cameroon	6.5	8.0	10.9	12.7	12.7	10.6	10.6	9.6	17.3	15.6	15.7	24.2%
Congo	26.9	26.2	26.7	23.7	19.4	15.9	16.7	18.5	26.1	24.1	23.5	21.3%
Côte d'Ivoire	23.4	24.5	22.7	19.7	14.9	15.1	22.3	14.4	14.7	17.8	19.7	32.4%
Dem. Rep. of the Congo	9.2	8.4	8.9	7.8	6.1	2.1	1.5	1.8	2.2	2.3	1.6	-73.6%
Egypt	61.4	62.4	64.5	60.0	57.7	55.5	59.4	56.1	57.7	60.1	56.8	-1.6%
Eritrea	..	..	..	..	..	18.6	20.7	18.1	15.5	16.3	16.3	..
Ethiopia	2.2	1.8	1.9	1.7	2.3	2.0	2.4	2.9	3.4	4.9	5.1	123.8%
Gabon	10.6	13.9	22.4	29.5	18.4	23.4	23.8	13.8	12.5	14.8	15.0	-18.4%
Ghana	15.3	15.0	13.0	11.5	11.5	11.8	18.8	26.0	32.9	35.6	32.6	184.1%
Kenya	14.7	13.8	14.4	12.8	12.4	11.4	13.3	11.1	13.6	13.3	14.4	16.0%
Libya	56.6	56.5	59.6	50.1	55.3	56.3	55.5	57.5	56.1	68.8	68.6	24.1%
Mauritius	17.1	25.2	31.7	33.0	41.7	47.4	58.6	60.4	66.6	63.8	62.6	50.0%
Morocco	53.2	58.3	60.5	62.9	61.6	66.7	64.1	63.2	64.9	67.7	67.7	9.9%
Mozambique	10.2	8.5	8.3	5.6	4.4	4.4	4.4	4.3	5.7	9.3	13.1	199.5%
Namibia	..	..	..	..	..	45.5	43.0	43.6	46.3	47.4	48.1	..
Niger	..	..	..	..	..	..	10.5	10.1	14.5	16.0	15.9	..
Nigeria	4.1	6.7	12.4	13.3	10.1	10.7	12.0	12.8	10.3	13.6	13.7	35.7%
Senegal	23.4	27.7	31.2	32.5	30.2	31.7	35.1	39.6	32.9	41.5	45.2	49.5%
South Africa	82.6	89.3	73.2	60.2	64.9	59.9	60.6	72.7	70.5	72.0	70.5	8.6%
South Sudan	..	..	..	..	..	..	..	..	..	56.3	54.3	..
Sudan	10.9	10.3	10.5	10.0	11.9	8.6	9.8	15.7	21.3	20.2	24.4	105.1%
United Rep. of Tanzania	4.4	4.4	4.4	4.0	4.1	5.4	4.6	7.0	7.1	10.7	9.5	132.9%
Togo	11.3	9.7	9.9	7.2	10.9	8.8	10.7	9.7	15.9	13.1	13.3	22.4%
Tunisia	53.7	53.3	57.9	55.4	58.9	57.8	57.7	55.9	54.1	56.3	54.7	-7.2%
Zambia	22.8	26.3	17.2	12.9	11.3	8.2	6.3	6.7	4.5	7.3	7.8	-30.8%
Zimbabwe	31.8	28.9	29.3	31.4	41.7	36.6	31.7	25.5	23.1	25.0	22.2	-46.9%
Other Africa	8.9	9.3	11.3	8.3	7.2	7.4	8.2	8.5	9.6	10.2	10.0	39.8%
Africa	31.0	34.8	34.5	32.7	32.3	31.1	31.6	34.5	34.0	34.2	33.8	4.8%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions / TPEStonnes CO₂ / terajoule

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Bangladesh	12.1	15.7	18.7	18.5	21.4	24.9	27.0	32.8	39.7	44.8	44.3	107.0%
Brunei Darussalam	53.6	45.4	46.7	39.5	45.1	47.8	44.3	51.9	50.6	52.5	51.0	13.2%
Cambodia	..	..	..	..	..	12.4	13.7	18.4	20.7	27.2	29.3	..
DPR of Korea	85.2	84.3	85.1	85.9	84.0	83.1	84.8	84.3	79.5	68.7	68.8	-18.1%
India	28.5	30.2	31.4	36.4	41.3	45.3	47.9	49.8	53.9	57.8	57.5	39.2%
Indonesia	17.2	22.0	29.0	30.6	32.5	37.3	39.2	42.5	41.8	48.2	47.2	45.3%
Malaysia	50.5	53.7	47.6	50.6	54.3	55.0	56.2	56.6	61.8	61.3	58.1	7.0%
Mongolia	..	..	..	90.0	90.0	90.7	89.3	87.6	85.6	87.9	86.5	-3.9%
Myanmar	13.6	11.2	12.9	12.5	8.8	13.6	17.3	17.0	14.0	25.1	26.1	198.1%
Nepal	1.2	1.9	2.7	2.6	3.7	6.3	9.1	8.0	9.6	11.6	15.8	328.3%
Pakistan	22.2	23.4	23.5	27.0	31.2	35.4	35.5	36.2	36.7	38.5	38.3	22.9%
Philippines	37.1	38.3	34.8	29.4	31.7	40.7	40.7	44.0	45.6	48.2	50.0	58.0%
Singapore	53.0	54.3	58.9	58.6	60.0	47.6	53.9	41.9	41.6	39.5	39.5	-34.2%
Sri Lanka	17.3	15.3	19.1	16.7	15.9	21.7	30.2	35.5	30.4	40.7	42.7	168.0%
Chinese Taipei	71.1	68.0	61.1	49.7	55.6	57.9	60.3	59.3	55.3	54.9	56.2	1.0%
Thailand	28.3	29.1	36.6	40.6	46.1	54.0	50.3	48.3	45.3	44.0	42.2	-8.4%
Viet Nam	29.4	29.1	24.7	26.1	23.2	30.0	36.8	45.8	51.1	52.9	55.2	137.4%
Other non-OECD Asia	44.6	46.8	51.4	37.8	35.5	32.3	32.9	39.1	43.1	51.3	61.3	72.5%
Asia (excl. China)	32.0	33.9	36.4	38.5	41.4	44.5	46.3	47.9	49.6	52.6	52.4	26.5%
People's Rep. of China	47.6	50.9	54.5	56.2	57.1	66.3	65.5	72.5	73.4	72.7	73.1	28.1%
Hong Kong, China	73.4	71.7	75.4	81.0	92.3	82.4	70.9	78.6	73.4	75.5	73.5	-20.3%
China	47.8	51.0	54.6	56.4	57.5	66.5	65.6	72.5	73.4	72.7	73.1	27.3%
Argentina	58.6	56.6	54.4	50.7	51.5	51.8	54.1	53.3	52.8	53.1	52.8	2.4%
Bolivia	51.1	52.0	41.1	40.9	47.1	43.7	34.5	41.6	52.0	52.2	54.7	16.0%
Brazil	29.9	34.0	35.2	28.8	31.4	33.8	37.3	34.4	33.3	36.5	35.0	11.4%
Colombia	46.0	43.8	46.9	47.2	45.1	47.1	50.1	47.3	46.1	48.7	51.2	13.5%
Costa Rica	37.6	41.7	41.0	36.8	37.1	45.0	37.4	33.5	34.1	33.6	35.1	-5.3%
Cuba	47.4	49.3	49.7	50.3	46.8	49.4	51.3	56.1	62.3	58.2	57.9	23.7%
Curaçao ¹	63.4	63.4	52.8	60.2	43.6	47.9	63.7	68.3	51.2	55.2	56.4	29.3%
Dominican Republic	35.6	40.4	44.0	44.0	44.1	51.1	57.1	57.2	59.9	61.4	61.0	38.5%
Ecuador	37.3	45.1	49.8	49.6	50.3	50.7	49.1	61.2	65.1	58.2	58.4	16.3%
El Salvador	17.8	20.3	15.1	14.9	20.4	32.5	31.2	33.1	31.9	36.0	36.9	80.9%
Guatemala	19.8	21.6	26.5	20.2	17.4	26.3	29.1	32.5	22.3	28.7	27.6	58.7%
Haiti	6.0	5.8	7.1	10.1	14.3	12.7	16.4	13.9	13.2	17.9	17.9	25.3%
Honduras	19.3	20.6	21.7	19.9	21.9	30.2	35.7	41.5	38.9	37.8	37.3	70.7%
Jamaica	65.8	66.3	68.6	64.7	66.0	66.8	66.9	68.7	66.5	61.5	59.1	-10.4%
Nicaragua	29.2	30.0	28.1	22.3	21.8	26.6	33.6	33.4	34.5	31.7	32.3	48.4%
Panama	35.9	43.7	49.2	40.8	41.1	48.9	45.3	55.5	58.5	59.9	54.2	32.0%
Paraguay	10.0	11.4	15.4	15.0	15.0	21.2	20.4	20.9	23.1	25.1	25.9	72.7%
Peru	40.3	42.1	43.3	40.8	47.0	50.7	51.6	50.1	50.7	49.6	50.8	8.2%
Suriname	..	..	..	..	..	..	56.9	64.3	57.7	76.5	77.4	..
Trinidad and Tobago	48.6	47.1	39.7	31.2	31.5	31.7	24.5	26.0	26.6	27.3	27.6	-12.3%
Uruguay	50.4	52.1	48.2	36.0	38.2	40.8	39.3	41.6	34.8	30.4	28.9	-24.2%
Venezuela	61.5	58.2	61.1	56.1	56.6	54.2	54.2	60.3	56.6	56.0	54.2	-4.3%
Other non-OECD Americas	40.3	43.1	42.4	61.2	58.1	63.5	65.4	67.2	65.1	63.3	64.1	10.3%
Non-OECD Americas	42.4	43.0	43.6	39.1	40.5	42.1	44.0	43.1	42.0	43.3	42.5	5.1%
Bahrain	49.1	58.6	61.6	52.2	48.8	50.1	47.5	47.3	48.1	50.2	49.7	1.8%
Islamic Republic of Iran	56.0	61.0	55.5	64.4	59.0	57.7	60.6	57.8	58.3	56.2	54.3	-7.9%
Iraq	61.4	60.9	64.4	61.6	62.5	67.7	64.9	66.1	66.3	65.1	60.1	-3.8%
Jordan	65.6	68.2	67.7	68.2	66.9	67.7	69.9	64.1	63.2	65.9	63.5	-5.1%
Kuwait	54.8	55.7	60.4	62.6	72.9	52.2	59.1	58.8	57.3	64.2	60.1	-17.5%
Lebanon	59.2	63.0	64.2	67.8	67.4	69.3	68.1	68.5	68.2	71.0	71.2	5.7%
Oman	72.1	72.2	46.7	63.8	57.5	57.5	64.4	60.7	54.0	60.5	62.5	8.7%
Qatar	57.8	57.7	50.3	45.2	45.5	49.3	46.5	47.6	47.9	42.3	44.7	-1.8%
Saudi Arabia	41.2	61.3	76.4	61.2	62.2	54.2	57.3	58.1	54.0	57.3	59.8	-3.8%
Syrian Arab Republic	54.6	64.6	65.9	59.6	62.1	61.5	57.3	61.4	62.4	58.9	62.7	0.9%
United Arab Emirates	58.1	60.6	63.5	62.0	60.7	60.1	60.5	59.6	60.5	57.9	61.7	1.7%
Yemen	39.1	60.6	65.3	66.8	59.8	66.0	67.2	68.3	68.5	73.8	74.8	25.0%
Middle East	53.5	60.7	63.7	61.9	60.6	57.9	59.4	58.5	57.3	57.2	57.5	-5.2%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions / TFCtonnes CO₂ / terajoule

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
World ¹	89.4	91.6	92.4	91.5	78.1	78.0	78.8	81.0	82.5	81.8	80.8	3.4%
<i>Annex I Parties</i>	..	..	..	..	85.5	83.0	82.6	81.9	79.4	76.1	74.7	-12.7%
<i>Annex II Parties</i>	86.3	86.0	84.6	82.8	83.7	81.6	81.3	80.8	78.3	75.2	73.9	-11.7%
<i>North America</i>	82.2	83.1	81.7	82.6	85.7	84.8	85.8	84.8	82.5	76.7	75.2	-12.2%
<i>Europe</i>	92.0	88.1	87.1	81.3	78.6	74.6	71.9	71.2	67.1	64.5	62.9	-20.0%
<i>Asia Oceania</i>	90.2	93.8	91.5	88.4	88.8	86.1	86.0	89.6	90.3	95.2	96.2	8.3%
<i>Annex I EIT</i>	..	..	..	..	90.8	88.9	88.8	87.2	83.9	79.3	77.0	-15.2%
<i>Non-Annex I Parties</i>	..	..	..	..	65.8	71.2	74.0	80.6	85.8	86.6	85.8	30.3%
<i>Annex B Kyoto Parties</i>	..	..	..	..	87.3	82.7	79.4	78.2	75.7	73.1	72.2	-17.3%
Non-OECD Total	97.7	104.7	107.5	105.7	71.6	73.4	75.2	81.0	85.3	85.8	84.8	18.5%
OECD Total	87.1	86.9	85.9	84.4	84.6	82.5	82.3	81.6	79.6	76.6	75.5	-10.8%
Canada	69.7	68.3	65.0	62.5	61.9	60.5	64.4	65.8	66.5	67.1	67.5	8.9%
Chile	76.8	68.9	70.1	61.4	63.3	58.1	57.0	59.5	68.7	77.5	76.9	21.4%
Mexico	65.2	69.7	74.1	72.8	73.7	80.0	90.2	92.9	89.7	88.2	87.4	18.6%
United States	83.4	84.7	83.7	84.9	88.7	88.0	88.5	87.1	84.5	77.9	76.2	-14.1%
OECD Americas	81.7	82.6	81.4	81.9	84.9	84.3	85.8	84.9	82.8	77.5	76.0	-10.4%
Australia	94.9	104.3	105.5	106.6	109.5	109.4	114.9	123.0	121.3	112.1	115.3	5.3%
Israel ²	100.0	100.9	99.8	114.8	112.5	109.3	109.4	117.5	110.1	103.4	100.4	-10.7%
Japan	90.0	92.8	89.7	85.8	85.9	82.9	81.2	83.3	84.1	92.6	93.2	8.4%
Korea	92.9	98.5	95.9	97.3	85.3	81.5	81.2	77.8	83.4	80.3	78.7	-7.7%
New Zealand	63.4	60.4	57.0	56.8	53.5	50.2	53.5	64.2	56.1	53.1	49.8	-6.9%
OECD Asia Oceania	90.5	94.2	92.0	89.8	88.7	85.6	85.4	87.3	88.9	91.0	90.9	2.6%
Austria	79.7	74.0	69.6	66.3	68.1	67.0	63.0	65.2	59.4	55.1	53.9	-20.8%
Belgium	96.4	89.7	92.9	79.9	79.0	70.1	65.2	61.3	58.2	52.8	51.8	-34.5%
Czech Republic	112.4	114.9	115.8	112.2	108.8	107.2	110.9	100.7	99.7	93.3	95.4	-12.3%
Denmark	90.3	92.5	102.2	102.4	92.4	96.1	85.2	77.6	75.4	57.1	58.1	-37.1%
Estonia	..	..	..	..	147.5	140.3	133.6	131.2	149.6	127.0	135.3	-8.3%
Finland	58.6	60.7	67.7	60.7	57.4	59.3	53.3	51.7	55.9	40.8	41.8	-27.2%
France	80.5	78.2	77.0	61.4	58.3	54.3	53.7	53.0	50.9	46.4	46.0	-21.1%
Germany	107.1	102.7	100.7	96.6	93.2	87.7	83.8	81.4	79.2	79.2	78.0	-16.3%
Greece	88.6	99.8	100.8	108.9	115.1	119.0	113.8	109.3	102.5	94.1	91.8	-20.3%
Hungary	97.3	94.8	91.5	86.7	75.8	77.9	73.9	63.8	59.4	53.9	54.1	-28.6%
Iceland	39.7	36.8	32.5	27.4	33.4	32.4	29.2	27.8	18.4	17.2	16.5	-50.6%
Ireland	103.0	101.5	97.5	97.8	95.2	96.2	90.7	86.7	82.0	80.4	80.7	-15.3%
Italy	80.1	81.4	83.0	81.2	80.9	79.5	77.9	77.2	70.0	66.3	66.0	-18.5%
Latvia	..	..	..	..	69.9	55.1	49.5	44.6	47.4	43.1	42.8	-38.7%
Luxembourg	160.3	119.5	109.6	101.4	92.4	70.2	59.1	67.1	64.6	58.8	56.7	-38.7%
Netherlands	81.2	68.8	63.9	65.4	64.7	66.9	64.3	61.9	60.8	65.9	64.8	0.2%
Norway	44.2	42.2	40.7	36.5	37.6	40.4	38.5	40.3	43.0	42.3	41.3	9.6%
Poland	122.8	121.4	127.4	130.5	134.0	123.4	119.7	114.4	105.0	101.5	99.1	-26.1%
Portugal	68.2	70.2	71.7	64.5	67.6	74.2	71.4	71.7	60.0	69.0	70.5	4.3%
Slovak Republic	94.8	88.6	102.3	99.9	83.1	89.7	77.1	76.0	72.2	70.1	70.4	-15.3%
Slovenia	..	..	..	..	87.5	80.7	72.2	71.5	70.7	63.9	65.1	-25.6%
Spain	86.7	92.6	92.5	87.1	79.8	79.2	77.8	78.1	67.9	74.0	69.3	-13.2%
Sweden	60.2	54.0	50.5	42.8	38.7	38.0	35.2	33.9	31.6	27.5	27.2	-29.7%
Switzerland	61.3	59.8	56.4	55.9	53.1	52.9	51.8	51.4	49.7	47.1	47.2	-11.2%
Turkey	61.6	64.4	64.9	73.8	76.1	76.5	83.1	78.9	81.5	81.4	82.7	8.6%
United Kingdom	110.4	103.3	103.8	97.5	95.0	85.3	82.5	85.4	82.5	74.6	69.1	-27.2%
OECD Europe	94.2	90.8	90.6	86.1	82.8	78.5	75.6	74.2	70.8	68.4	67.2	-18.8%
<i>IEA/Accession/Association</i>	79.2	79.1	79.1	77.8	79.2	80.3	81.5	84.3	86.6	86.2	85.0	7.4%
<i>European Union - 28</i>	..	..	..	..	84.8	80.4	76.7	75.4	71.5	68.5	67.0	-21.0%
<i>G20</i>	..	..	..	..	80.8	81.3	82.4	85.3	87.3	86.6	85.4	5.7%
<i>Africa</i>	37.3	42.2	43.5	44.7	43.3	42.4	42.7	47.0	46.9	47.1	46.5	7.5%
<i>Americas</i>	79.1	79.5	78.3	78.0	80.5	79.9	81.3	80.1	77.5	73.6	72.2	-10.3%
<i>Asia</i>	59.3	62.8	66.6	68.2	73.2	78.9	81.7	88.3	94.1	95.1	94.5	29.0%
<i>Europe</i>	94.5	91.2	90.5	86.7	85.4	81.2	79.0	77.8	74.4	71.1	69.3	-18.9%
<i>Oceania</i>	88.8	96.1	97.1	97.5	99.1	98.0	103.1	112.1	110.2	101.6	103.4	4.4%

1. The ratio for the world has been calculated to include international marine bunkers and international aviation bunkers.

2. Please refer to the chapter Geographical coverage.

CO₂ emissions / TFCtonnes CO₂ / terajoule

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Non-OECD Total	97.7	104.7	107.5	105.7	71.6	73.4	75.2	81.0	85.3	85.8	84.8	18.5%
Albania	65.2	62.4	60.4	71.8	62.2	45.2	47.9	47.2	47.1	45.1	43.9	-29.4%
Armenia	..	..	..	..	73.2	70.1	73.9	57.5	53.0	54.1	54.9	-25.0%
Azerbaijan	..	..	..	..	76.5	81.1	99.9	86.0	81.3	84.4	83.4	9.1%
Belarus	..	..	..	..	69.1	74.1	69.1	69.1	72.5	69.0	68.8	-0.6%
Bosnia and Herzegovina	..	..	..	..	117.0	63.2	145.1	145.0	152.0	132.8	142.6	21.9%
Bulgaria	103.6	103.6	103.5	104.8	101.9	105.5	105.5	107.0	116.2	104.9	97.1	-4.7%
Croatia	..	..	..	..	69.0	58.7	60.7	60.6	56.4	52.9	53.8	-22.1%
Cyprus ¹	95.2	102.1	100.7	102.1	105.9	100.1	104.5	106.0	101.2	98.5	99.1	-6.5%
FYR of Macedonia	..	..	..	..	136.0	134.0	129.7	119.7	109.4	89.9	83.6	-38.5%
Georgia	..	..	..	..	89.1	86.5	48.2	43.8	44.8	48.9	48.6	-45.5%
Gibraltar	63.7	59.6	88.0	79.3	74.7	75.4	74.9	74.9	77.4	79.2	79.8	6.8%
Kazakhstan	..	..	..	..	95.0	101.0	123.8	122.5	136.2	139.9	145.9	53.5%
Kosovo	..	..	..	..	..	..	158.9	161.6	174.7	148.5	147.8	..
Kyrgyzstan	..	..	..	..	78.7	59.8	62.3	63.5	63.5	70.2	63.9	-18.9%
Lithuania	..	..	..	..	73.9	63.0	55.5	55.6	54.5	42.8	42.6	-42.4%
Malta	123.3	127.7	145.3	211.0	207.4	150.5	160.2	159.0	149.5	84.8	69.1	-66.7%
Republic of Moldova	..	..	..	..	109.2	91.1	97.6	77.9	68.4	68.0	66.1	-39.5%
Montenegro	..	..	..	..	..	..	..	62.7	81.7	81.7	70.1	..
Romania	84.0	83.1	73.2	85.9	93.4	104.7	86.6	85.4	76.5	73.6	70.9	-24.1%
Russian Federation	..	..	..	..	82.7	80.7	84.3	85.9	81.8	76.7	73.1	-11.5%
Serbia	..	..	..	..	122.0	171.9	143.6	121.4	115.6	125.3	120.0	-1.6%
Tajikistan	..	..	..	..	56.2	30.3	28.9	28.8	28.1	40.8	45.8	-18.5%
Turkmenistan	..	..	..	..	85.4	89.2	95.0	95.5	93.6	91.7	91.7	7.4%
Ukraine	..	..	..	..	109.5	101.9	97.4	84.6	86.0	88.2	91.4	-16.5%
Uzbekistan	..	..	..	..	78.5	68.8	72.5	74.9	73.6	79.0	76.0	-3.1%
Former Soviet Union	..	..	..	..	..	..	..	..	..	..	..	..
Former Yugoslavia	..	..	..	..	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia	1 059.6	1 113.4	970.8	1 174.6	87.8	85.6	86.9	86.7	85.1	81.7	79.4	-9.5%
Algeria	96.6	98.7	112.6	111.1	96.1	99.0	95.4	89.8	86.3	83.1	80.7	-16.0%
Angola	13.3	15.2	18.6	17.6	20.7	19.0	20.0	22.3	35.2	38.3	38.0	83.7%
Benin	7.5	10.2	8.0	8.4	4.3	3.3	20.4	28.3	36.1	35.2	36.2	748.6%
Botswana	..	..	..	48.4	75.3	70.6	68.4	68.5	46.8	87.5	84.5	12.1%
Cameroon	6.8	8.4	11.5	13.4	13.3	11.2	11.2	10.3	20.7	19.9	20.0	50.3%
Congo	32.2	31.7	32.4	30.6	24.8	21.5	24.6	26.9	35.1	31.4	30.5	22.8%
Côte d'Ivoire	33.9	35.7	32.7	28.7	22.2	23.7	34.9	27.5	26.1	34.0	34.0	53.2%
Dem. Rep. of the Congo	9.7	8.9	9.3	8.3	6.7	2.3	1.5	1.9	2.3	3.0	2.2	-68.0%
Egypt	70.2	72.7	73.2	80.0	80.2	77.2	75.7	82.1	79.7	85.8	84.3	5.1%
Eritrea	..	..	..	..	..	25.2	27.6	29.0	23.4	25.5	25.5	..
Ethiopia	2.8	2.3	2.4	2.1	2.8	2.5	3.0	3.6	4.1	6.0	6.2	120.1%
Gabon	18.3	23.7	30.6	32.9	21.5	25.3	25.8	14.8	13.2	16.3	16.5	-23.6%
Ghana	17.7	17.9	15.3	14.4	14.0	14.8	22.1	32.0	46.5	48.4	44.7	218.5%
Kenya	20.9	19.6	20.2	17.7	17.9	16.4	19.7	16.8	20.5	21.3	22.7	26.9%
Libya	114.3	107.0	105.3	102.3	112.4	100.6	93.5	98.7	86.7	124.5	103.8	-7.7%
Mauritius	18.1	27.1	35.4	38.4	52.5	61.8	89.6	98.7	117.7	117.0	115.9	120.6%
Morocco	58.1	70.1	73.6	81.5	83.2	88.4	82.6	83.5	83.8	87.6	85.9	3.4%
Mozambique	12.9	10.8	10.6	7.2	5.4	5.5	4.8	4.7	6.2	11.5	16.2	196.8%
Namibia	..	..	..	..	..	48.4	45.9	47.6	50.5	51.5	52.5	..
Niger	..	..	..	..	..	..	11.3	10.8	15.7	17.4	16.7	..
Nigeria	4.3	7.0	13.2	14.5	11.3	11.6	13.3	14.4	12.4	15.6	15.9	40.3%
Senegal	35.6	43.9	46.4	47.8	47.1	49.4	57.2	64.2	51.0	62.0	64.7	37.3%
South Africa	113.0	121.7	113.8	116.5	114.1	118.7	120.3	140.8	146.5	139.4	141.4	23.9%
South Sudan	..	..	..	..	..	..	..	..	..	81.1	77.0	..
Sudan	20.2	18.8	18.8	18.0	20.8	16.0	17.5	25.4	30.5	31.5	36.4	74.8%
United Rep. of Tanzania	5.0	4.9	5.0	4.5	4.6	6.1	5.2	8.1	8.2	12.3	10.9	138.7%
Togo	17.3	14.8	14.8	11.0	16.2	14.2	17.7	15.8	24.4	20.2	20.4	25.9%
Tunisia	69.3	70.7	80.0	78.3	80.0	76.4	76.4	69.5	74.9	77.6	75.2	-6.0%
Zambia	27.7	29.4	21.4	16.3	14.2	10.3	7.9	8.4	5.7	9.1	9.8	-30.7%
Zimbabwe	35.0	31.1	31.2	34.6	48.8	44.9	36.7	30.3	26.3	29.6	25.6	-47.6%
Other Africa	9.0	9.4	11.5	8.7	7.6	7.8	9.1	9.8	11.2	12.5	12.3	61.5%
Africa	37.3	42.2	43.5	44.7	43.3	42.4	42.7	47.0	46.9	47.1	46.5	7.5%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions / TFCtonnes CO₂ / terajoule

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Bangladesh	12.8	16.5	20.2	21.3	25.1	29.3	33.0	41.7	52.2	60.4	60.9	142.7%
Brunei Darussalam	97.6	328.2	297.1	250.3	221.8	202.0	183.8	183.2	124.9	145.4	113.5	-48.8%
Cambodia	..	..	..	..	..	13.8	15.9	22.0	24.2	32.3	34.9	..
DPR of Korea	101.6	103.5	102.7	103.3	102.6	98.3	99.3	98.7	92.2	81.8	82.2	-19.9%
India	31.5	34.0	36.2	44.0	52.0	60.6	67.3	71.6	78.1	87.6	86.7	66.6%
Indonesia	18.8	24.0	32.5	35.0	40.1	49.0	50.7	57.3	60.5	65.3	66.0	64.5%
Malaysia	66.1	71.9	79.1	83.1	85.2	84.3	92.3	97.9	106.8	102.1	92.3	8.3%
Mongolia	..	..	..	117.0	109.6	136.1	146.1	131.1	126.3	131.1	129.1	17.7%
Myanmar	15.1	12.5	14.5	14.5	9.9	15.2	19.3	19.4	15.1	28.2	30.5	207.0%
Nepal	1.2	1.9	2.7	2.6	3.7	6.3	9.2	8.1	9.7	11.7	16.0	331.7%
Pakistan	24.2	25.8	25.8	30.2	36.9	42.6	44.2	44.0	44.1	44.8	44.9	21.5%
Philippines	44.0	46.0	47.8	43.4	46.2	59.3	68.0	74.9	77.7	85.6	86.6	87.3%
Singapore	132.2	135.5	142.1	109.0	138.2	148.1	121.1	67.2	68.4	58.1	58.7	-57.5%
Sri Lanka	18.2	16.0	20.2	17.3	16.6	22.9	34.1	39.7	33.7	46.8	50.9	207.7%
Chinese Taipei	97.4	93.7	92.1	79.7	90.2	94.1	105.2	99.4	89.9	86.3	87.6	-2.9%
Thailand	40.5	39.6	53.1	57.1	66.9	75.3	71.9	68.4	62.9	59.9	59.9	-10.5%
Viet Nam	31.2	31.0	27.3	29.2	25.9	32.8	42.1	53.8	62.4	69.1	68.8	166.1%
Other non-OECD Asia	46.5	50.3	56.9	43.2	41.5	37.3	38.4	47.5	50.1	63.9	87.7	111.4%
Asia (excl. China)	36.3	39.1	43.7	47.7	53.5	60.1	64.7	67.6	70.8	75.8	75.7	41.5%
People's Rep. of China	55.3	60.0	66.8	69.0	75.9	88.3	94.8	105.3	114.4	111.1	109.8	44.8%
Hong Kong, China	104.1	109.0	120.1	144.5	152.4	126.9	102.7	132.3	122.4	117.1	117.2	-23.1%
China	55.6	60.3	67.2	69.5	76.5	88.7	94.9	105.4	114.4	111.1	109.9	43.7%
Argentina	84.9	81.5	77.6	72.1	79.0	67.8	70.5	70.3	73.2	73.3	73.4	-7.0%
Bolivia	61.0	61.9	51.2	49.0	57.0	60.4	58.5	63.1	66.5	65.8	69.2	21.4%
Brazil	33.5	38.9	41.8	36.8	39.5	42.1	45.5	43.2	42.0	47.4	44.4	12.2%
Colombia	54.7	54.4	57.8	59.4	57.8	57.7	61.3	59.0	64.1	64.2	69.0	19.4%
Costa Rica	44.2	47.9	45.1	39.2	42.4	54.5	47.4	43.7	45.3	44.6	46.2	9.0%
Cuba	56.0	60.8	65.3	65.1	58.5	70.1	67.4	86.6	100.3	90.1	86.7	48.2%
Curaçao ¹	163.1	155.9	189.9	122.4	101.5	81.4	154.5	153.7	105.4	162.3	142.9	40.7%
Dominican Republic	46.5	60.5	64.5	70.3	74.4	84.1	88.7	84.9	84.0	90.2	88.8	19.3%
Ecuador	39.4	52.5	62.5	56.4	57.0	67.8	64.5	70.9	75.9	73.6	71.9	26.2%
El Salvador	18.9	23.7	18.5	17.9	24.8	41.8	41.2	45.2	57.6	62.8	64.0	157.8%
Guatemala	22.5	23.4	30.6	22.5	19.0	29.2	34.3	40.0	28.8	35.5	35.8	88.5%
Haiti	7.2	6.9	8.7	12.4	18.1	15.9	19.3	17.7	17.2	23.4	23.4	29.6%
Honduras	20.4	21.4	22.7	20.5	22.3	33.4	39.3	51.6	47.4	44.6	44.5	99.6%
Jamaica	92.4	81.0	87.2	90.5	91.3	127.4	116.2	92.2	93.8	87.3	89.1	-2.5%
Nicaragua	33.0	34.2	32.1	28.4	29.9	37.2	44.3	48.3	49.9	48.9	49.1	64.2%
Panama	74.5	78.1	61.7	53.3	49.6	61.8	58.6	65.5	73.8	72.8	68.3	37.7%
Paraguay	10.6	12.1	16.3	15.7	15.7	22.3	21.5	22.6	25.7	27.5	29.2	85.4%
Peru	46.6	49.3	53.2	47.7	53.4	58.4	59.5	62.3	65.0	65.5	67.2	25.8%
Suriname	..	..	..	..	..	..	66.4	86.0	74.6	84.5	87.3	..
Trinidad and Tobago	145.3	95.0	86.6	54.0	50.8	48.0	33.5	36.9	38.1	38.9	39.1	-23.0%
Uruguay	63.5	67.0	60.2	41.0	44.5	46.6	48.5	51.6	39.2	34.0	32.2	-27.7%
Venezuela	115.9	94.0	92.4	86.4	86.6	80.0	84.5	80.8	83.4	89.4	92.9	7.4%
Other non-OECD Americas	64.6	69.2	67.0	62.9	62.3	64.0	63.0	63.6	69.9	85.2	84.9	36.2%
Non-OECD Americas	54.4	54.6	56.4	51.3	53.2	54.2	56.4	55.4	55.5	58.1	56.9	6.9%
Bahrain	235.9	112.7	136.0	151.0	121.8	123.2	123.9	116.1	119.3	114.2	111.3	-8.6%
Islamic Republic of Iran	74.8	74.8	76.7	78.3	74.8	74.9	78.7	78.7	75.6	73.2	71.4	-4.5%
Iraq	95.9	86.6	80.6	80.7	82.1	131.0	88.9	95.0	129.5	178.4	180.2	119.5%
Jordan	84.2	85.6	88.5	97.6	94.1	98.3	96.1	93.5	98.9	102.4	93.7	-0.4%
Kuwait	98.4	103.3	100.9	108.2	168.0	109.7	135.7	127.0	122.2	119.2	112.3	-33.2%
Lebanon	77.2	83.7	107.3	97.0	116.0	84.9	101.4	97.8	112.7	111.3	111.1	-4.2%
Oman	75.0	84.9	97.4	97.3	131.7	138.7	160.4	120.9	82.6	74.8	74.2	-43.7%
Qatar	117.1	111.6	87.1	70.6	78.7	93.9	87.3	93.7	104.3	100.3	104.9	33.4%
Saudi Arabia	145.6	136.3	112.3	105.1	91.4	89.6	88.2	85.3	83.0	88.0	90.2	-1.3%
Syrian Arab Republic	77.9	71.8	76.4	78.3	85.5	89.7	86.4	92.2	98.4	95.5	96.9	13.4%
United Arab Emirates	61.0	72.9	82.5	79.9	76.5	77.2	82.8	95.8	82.3	79.6	87.1	13.9%
Yemen	89.3	81.7	83.6	87.3	83.0	88.5	96.1	90.7	99.7	98.9	90.5	9.0%
Middle East	88.3	86.2	91.0	88.3	85.2	88.0	87.3	87.6	85.9	86.7	87.4	2.5%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions / GDP using exchange rateskilogrammes CO₂ / US dollar using 2010 prices

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
World ¹	0.69	0.66	0.62	0.57	0.54	0.51	0.47	0.47	0.46	0.43	0.42	-22.7%
<i>Annex I Parties</i>	..	..	..	..	0.46	0.40	0.36	0.33	0.30	0.26	0.25	-45.1%
<i>Annex II Parties</i>	0.57	0.52	0.47	0.40	0.35	0.33	0.31	0.29	0.26	0.22	0.22	-39.3%
<i>North America</i>	0.84	0.78	0.69	0.57	0.52	0.48	0.44	0.39	0.36	0.30	0.29	-44.6%
<i>Europe</i>	0.43	0.39	0.36	0.31	0.27	0.24	0.22	0.20	0.18	0.15	0.15	-44.9%
<i>Asia Oceania</i>	0.36	0.36	0.31	0.25	0.24	0.24	0.23	0.23	0.21	0.20	0.20	-15.8%
<i>Annex I EIT</i>	..	..	..	..	1.60	1.57	1.26	0.98	0.84	0.71	0.70	-56.3%
<i>Non-Annex I Parties</i>	..	..	..	..	0.79	0.78	0.71	0.77	0.74	0.68	0.66	-16.2%
<i>Annex B Kyoto Parties</i>	..	..	..	..	0.40	0.33	0.28	0.26	0.24	0.20	0.19	-51.0%
Non-OECD Total	0.96	0.97	0.97	0.99	1.04	0.95	0.85	0.86	0.80	0.73	0.71	-31.9%
OECD Total	0.59	0.54	0.49	0.42	0.38	0.35	0.33	0.30	0.28	0.24	0.23	-37.9%
Canada	0.62	0.58	0.54	0.44	0.41	0.41	0.38	0.35	0.33	0.30	0.30	-28.5%
Chile	0.49	0.47	0.41	0.36	0.39	0.32	0.34	0.30	0.31	0.31	0.32	-18.5%
Mexico	0.32	0.35	0.38	0.41	0.40	0.41	0.39	0.42	0.42	0.36	0.35	-11.3%
United States	0.87	0.80	0.70	0.59	0.53	0.49	0.45	0.40	0.36	0.30	0.29	-46.0%
OECD Americas	0.82	0.75	0.66	0.56	0.51	0.48	0.44	0.39	0.36	0.30	0.29	-42.9%
Australia	0.37	0.41	0.41	0.38	0.39	0.36	0.35	0.33	0.30	0.25	0.26	-33.0%
Israel ²	0.31	0.29	0.29	0.32	0.34	0.34	0.32	0.31	0.29	0.23	0.22	-35.8%
Japan	0.37	0.35	0.29	0.23	0.22	0.22	0.21	0.21	0.19	0.19	0.19	-13.6%
Korea	0.82	0.83	0.89	0.71	0.64	0.66	0.61	0.51	0.50	0.46	0.45	-29.4%
New Zealand	0.23	0.24	0.24	0.23	0.26	0.25	0.26	0.25	0.21	0.18	0.17	-34.2%
OECD Asia Oceania	0.38	0.37	0.33	0.28	0.27	0.28	0.27	0.26	0.25	0.24	0.24	-10.9%
Austria	0.32	0.28	0.26	0.24	0.22	0.21	0.18	0.20	0.17	0.15	0.15	-30.6%
Belgium	0.59	0.50	0.46	0.36	0.32	0.31	0.28	0.24	0.21	0.18	0.18	-44.7%
Czech Republic	1.53	1.36	1.32	1.31	1.04	0.89	0.80	0.64	0.54	0.44	0.44	-57.8%
Denmark	0.36	0.32	0.34	0.29	0.22	0.23	0.17	0.15	0.15	0.09	0.10	-57.0%
Estonia	..	..	..	..	2.34	1.51	1.02	0.84	0.95	0.65	0.69	-70.7%
Finland	0.46	0.42	0.45	0.34	0.32	0.34	0.26	0.23	0.25	0.17	0.18	-44.1%
France	0.38	0.34	0.31	0.22	0.18	0.17	0.16	0.15	0.13	0.11	0.10	-42.5%
Germany	0.62	0.56	0.51	0.46	0.37	0.30	0.26	0.25	0.22	0.20	0.19	-47.3%
Greece	0.20	0.23	0.25	0.29	0.35	0.36	0.35	0.31	0.28	0.26	0.26	-26.9%
Hungary	0.99	0.90	0.89	0.79	0.63	0.61	0.50	0.41	0.36	0.30	0.30	-52.7%
Iceland	0.39	0.37	0.29	0.25	0.24	0.25	0.21	0.18	0.15	0.14	0.13	-48.4%
Ireland	0.57	0.45	0.44	0.40	0.36	0.31	0.25	0.21	0.18	0.11	0.11	-69.3%
Italy	0.30	0.29	0.26	0.23	0.22	0.22	0.20	0.21	0.18	0.16	0.16	-29.6%
Latvia	..	..	..	..	..	0.70	0.42	0.31	0.34	0.24	0.24	..
Luxembourg	1.39	0.96	0.84	0.61	0.45	0.27	0.20	0.24	0.20	0.14	0.13	-69.9%
Netherlands	0.39	0.36	0.34	0.31	0.28	0.28	0.22	0.21	0.20	0.18	0.18	-36.9%
Norway	0.17	0.15	0.14	0.11	0.11	0.10	0.09	0.08	0.09	0.08	0.08	-29.9%
Poland	1.68	1.55	1.82	1.84	1.52	1.32	0.89	0.78	0.64	0.51	0.51	-66.3%
Portugal	0.18	0.19	0.20	0.19	0.23	0.26	0.26	0.27	0.20	0.21	0.20	-10.1%
Slovak Republic	1.12	1.09	1.26	1.14	1.07	0.88	0.67	0.53	0.39	0.29	0.29	-73.1%
Slovenia	..	..	..	..	0.44	0.47	0.38	0.35	0.32	0.26	0.27	-38.6%
Spain	0.25	0.26	0.29	0.25	0.23	0.24	0.24	0.25	0.18	0.17	0.16	-29.7%
Sweden	0.38	0.33	0.28	0.21	0.16	0.17	0.13	0.11	0.09	0.07	0.07	-58.0%
Switzerland	0.12	0.12	0.11	0.11	0.09	0.10	0.09	0.08	0.07	0.06	0.06	-37.2%
Turkey	0.27	0.31	0.33	0.34	0.35	0.36	0.39	0.33	0.35	0.29	0.30	-14.7%
United Kingdom	0.60	0.52	0.46	0.39	0.33	0.29	0.25	0.22	0.20	0.15	0.14	-59.6%
OECD Europe	0.48	0.44	0.41	0.36	0.31	0.28	0.25	0.23	0.21	0.18	0.17	-44.3%
<i>IEA/Accession/Association</i>	0.61	0.57	0.53	0.47	0.43	0.43	0.40	0.40	0.41	0.37	0.36	-15.9%
<i>European Union - 28</i>	..	..	..	..	0.34	0.30	0.26	0.24	0.21	0.18	0.17	-48.7%
<i>G20</i>	..	..	..	..	0.50	0.47	0.43	0.44	0.44	0.40	0.39	-21.9%
<i>Africa</i>	0.44	0.50	0.50	0.56	0.57	0.59	0.57	0.57	0.51	0.50	0.49	-13.5%
<i>Americas</i>	0.73	0.66	0.59	0.51	0.47	0.44	0.42	0.37	0.34	0.29	0.29	-39.1%
<i>Asia</i>	0.60	0.61	0.62	0.60	0.64	0.66	0.62	0.70	0.71	0.66	0.63	-1.2%
<i>Europe</i>	0.51	0.46	0.44	0.38	0.50	0.41	0.34	0.32	0.29	0.24	0.24	-52.9%
<i>Oceania</i>	0.35	0.39	0.39	0.36	0.37	0.35	0.34	0.32	0.29	0.25	0.25	-31.6%

1. The ratio for the world has been calculated to include international marine bunkers and international aviation bunkers.

2. Please refer to the chapter Geographical coverage.

CO₂ emissions / GDP using exchange rateskilogrammes CO₂ / US dollar using 2010 prices

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Non-OECD Total	0.96	0.97	0.97	0.99	1.04	0.95	0.85	0.86	0.80	0.73	0.71	-31.9%
Albania	1.17	1.05	1.25	1.15	0.92	0.34	0.44	0.41	0.33	0.29	0.27	-70.5%
Armenia	..	..	..	..	3.12	1.00	0.79	0.54	0.44	0.41	0.42	-86.4%
Azerbaijan	..	..	..	..	2.40	3.46	2.08	1.17	0.45	0.52	0.55	-77.1%
Belarus	..	..	..	..	3.16	2.76	1.86	1.37	1.04	0.87	0.90	-71.6%
Bosnia and Herzegovina	..	..	..	..	7.06	0.98	1.21	1.06	1.19	1.05	1.18	-83.3%
Bulgaria	4.11	3.46	2.98	2.44	2.05	1.66	1.29	1.07	0.88	0.80	0.72	-65.1%
Croatia	..	..	..	..	0.42	0.37	0.36	0.34	0.31	0.27	0.27	-37.2%
Cyprus ¹	0.54	0.43	0.38	0.32	0.32	0.32	0.33	0.31	0.28	0.25	0.26	-17.7%
FYR of Macedonia	..	..	..	..	1.12	1.37	1.21	1.15	0.88	0.67	0.64	-43.1%
Georgia	..	..	..	..	1.98	1.70	0.73	0.45	0.43	0.57	0.58	-70.6%
Gibraltar	0.15	0.13	0.17	0.15	0.20	0.36	0.37	0.39	0.45	0.51	0.52	156.7%
Kazakhstan	..	..	..	..	2.46	2.88	1.68	1.43	1.49	1.21	1.22	-50.4%
Kosovo	..	..	..	..	..	..	1.56	1.40	1.49	1.26	1.29	..
Kyrgyzstan	..	..	..	..	4.73	1.83	1.39	1.27	1.26	1.62	1.47	-68.9%
Lithuania	..	..	..	..	1.19	0.70	0.42	0.36	0.33	0.24	0.24	-80.2%
Malta	0.56	0.39	0.34	0.37	0.54	0.43	0.30	0.33	0.30	0.15	0.12	-78.5%
Republic of Moldova	..	..	..	..	3.06	2.98	1.86	1.57	1.36	1.08	1.05	-65.6%
Montenegro	..	..	..	..	..	..	..	0.60	0.62	0.52	0.46	..
Romania	2.15	1.74	1.52	1.29	1.36	1.06	0.78	0.64	0.45	0.37	0.34	-74.8%
Russian Federation	..	..	..	..	1.53	1.76	1.55	1.16	1.00	0.90	0.88	-42.2%
Serbia	..	..	..	..	2.52	1.85	1.68	1.43	1.16	1.11	1.10	-56.3%
Tajikistan	..	..	..	..	1.63	0.96	0.85	0.57	0.41	0.53	0.56	-65.4%
Turkmenistan	..	..	..	..	3.26	3.85	3.41	3.49	2.52	1.86	1.74	-46.6%
Ukraine	..	..	..	..	3.35	4.01	3.30	2.24	1.96	1.55	1.60	-52.3%
Uzbekistan	..	..	..	..	5.62	5.70	5.69	4.11	2.48	1.53	1.37	-75.7%
Former Soviet Union	1.74	1.77	1.72	1.62	..	..	..	..	..	..	..	..
Former Yugoslavia	0.79	0.77	0.65	0.91	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia	1.72	1.73	1.65	1.56	1.83	1.92	1.59	1.20	1.03	0.89	0.88	-52.0%
Algeria	0.25	0.26	0.40	0.48	0.56	0.59	0.56	0.55	0.59	0.69	0.65	16.7%
Angola	0.07	0.08	0.11	0.10	0.12	0.15	0.13	0.13	0.18	0.19	0.19	52.8%
Benin	0.18	0.26	0.18	0.17	0.09	0.06	0.30	0.46	0.66	0.61	0.63	636.5%
Botswana	..	..	..	0.49	0.53	0.48	0.47	0.42	0.26	0.44	0.42	-20.6%
Cameroon	0.12	0.13	0.16	0.14	0.18	0.18	0.16	0.14	0.21	0.20	0.19	7.9%
Congo	0.24	0.19	0.17	0.11	0.10	0.08	0.07	0.09	0.15	0.19	0.19	92.7%
Côte d'Ivoire	0.22	0.23	0.21	0.18	0.15	0.17	0.28	0.26	0.25	0.28	0.28	82.9%
Dem. Rep. of the Congo	0.12	0.12	0.15	0.14	0.13	0.07	0.07	0.08	0.09	0.09	0.07	-49.6%
Egypt	0.70	0.78	0.78	0.89	0.87	0.77	0.73	0.89	0.81	0.80	0.79	-9.6%
Eritrea	..	..	..	..	..	0.47	0.32	0.26	0.23	0.22	0.22	..
Ethiopia	0.17	0.15	0.16	0.18	0.22	0.22	0.25	0.25	0.20	0.21	0.21	-4.1%
Gabon	0.10	0.08	0.15	0.17	0.09	0.11	0.12	0.13	0.19	0.18	0.18	105.8%
Ghana	0.19	0.25	0.23	0.22	0.21	0.22	0.27	0.27	0.33	0.30	0.27	25.6%
Kenya	0.39	0.32	0.30	0.28	0.25	0.24	0.30	0.24	0.28	0.27	0.28	11.9%
Libya	0.07	0.19	0.24	0.41	0.55	0.73	0.77	0.70	0.64	2.14	2.31	318.5%
Mauritius	0.20	0.25	0.26	0.22	0.30	0.31	0.37	0.39	0.37	0.33	0.33	9.8%
Morocco	0.38	0.46	0.50	0.49	0.46	0.55	0.51	0.54	0.50	0.49	0.48	6.2%
Mozambique	1.12	1.08	1.04	0.86	0.47	0.43	0.28	0.21	0.23	0.35	0.49	2.7%
Namibia	..	..	..	..	..	0.30	0.27	0.28	0.27	0.26	0.27	..
Niger	..	..	..	..	..	..	0.18	0.17	0.24	0.26	0.24	..
Nigeria	0.06	0.09	0.18	0.26	0.21	0.24	0.28	0.22	0.15	0.18	0.19	-12.1%
Senegal	0.29	0.34	0.41	0.37	0.33	0.35	0.41	0.43	0.42	0.48	0.48	44.9%
South Africa	1.09	1.23	1.09	1.09	1.09	1.12	1.05	1.16	1.08	0.98	0.99	-9.7%
South Sudan	..	..	..	..	..	..	..	..	..	0.23	0.19	..
Sudan	0.29	0.23	0.24	0.25	0.27	0.17	0.16	0.21	0.23	0.21	0.25	-7.1%
United Rep. of Tanzania	0.23	0.19	0.18	0.16	0.14	0.19	0.16	0.22	0.20	0.27	0.23	65.0%
Togo	0.28	0.22	0.20	0.16	0.28	0.28	0.37	0.36	0.65	0.46	0.46	64.9%
Tunisia	0.53	0.51	0.61	0.61	0.67	0.63	0.61	0.55	0.53	0.53	0.52	-22.3%
Zambia	0.51	0.58	0.43	0.35	0.31	0.24	0.17	0.16	0.08	0.13	0.14	-55.7%
Zimbabwe	1.08	0.92	0.95	0.94	1.26	1.10	0.87	0.98	0.93	0.81	0.70	-44.1%
Other Africa	0.20	0.22	0.27	0.21	0.22	0.25	0.23	0.19	0.19	0.20	0.20	-10.6%
Africa	0.44	0.50	0.50	0.56	0.57	0.59	0.57	0.57	0.51	0.50	0.49	-13.5%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions / GDP using exchange rateskilogrammes CO₂ / US dollar using 2010 prices

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Bangladesh	0.12	0.19	0.23	0.22	0.27	0.31	0.31	0.37	0.43	0.45	0.44	62.5%
Brunei Darussalam	0.07	0.20	0.23	0.31	0.34	0.40	0.37	0.36	0.50	0.44	0.48	39.7%
Cambodia	..	..	..	..	..	0.40	0.38	0.32	0.41	0.50	0.55	..
DPR of Korea	8.35	6.05	4.83	3.61	2.74	2.28	2.35	2.61	1.84	0.84	0.94	-65.8%
India	0.88	0.93	0.97	1.08	1.13	1.18	1.10	0.97	0.95	0.88	0.84	-25.7%
Indonesia	0.27	0.31	0.37	0.37	0.43	0.47	0.56	0.56	0.48	0.46	0.44	1.2%
Malaysia	0.56	0.53	0.52	0.56	0.61	0.62	0.71	0.76	0.75	0.67	0.63	3.6%
Mongolia	..	..	..	3.67	3.34	3.05	2.34	2.09	1.97	1.46	1.52	-54.4%
Myanmar	0.97	0.76	0.72	0.64	0.49	0.63	0.58	0.36	0.16	0.27	0.28	-42.5%
Nepal	0.06	0.09	0.12	0.10	0.13	0.20	0.28	0.24	0.26	0.29	0.43	220.9%
Pakistan	0.58	0.62	0.56	0.61	0.70	0.79	0.80	0.77	0.73	0.70	0.67	-4.1%
Philippines	0.50	0.49	0.41	0.39	0.40	0.54	0.54	0.46	0.39	0.39	0.40	x
Singapore	0.40	0.40	0.39	0.37	0.43	0.37	0.31	0.22	0.19	0.15	0.15	-64.3%
Sri Lanka	0.31	0.25	0.27	0.20	0.18	0.20	0.31	0.32	0.22	0.26	0.26	47.2%
Chinese Taipei	0.95	0.85	0.87	0.70	0.72	0.69	0.72	0.70	0.58	0.50	0.50	-29.9%
Thailand	0.45	0.47	0.51	0.49	0.57	0.67	0.70	0.71	0.66	0.63	0.60	5.4%
Viet Nam	1.03	1.06	0.88	0.75	0.59	0.63	0.72	0.93	1.09	1.09	1.14	93.2%
Other non-OECD Asia	0.50	0.52	0.58	0.33	0.29	0.23	0.26	0.27	0.27	0.36	0.49	68.6%
Asia (excl. China)	0.73	0.73	0.73	0.75	0.76	0.76	0.78	0.73	0.69	0.65	0.64	-16.0%
People's Rep. of China	3.90	4.14	4.00	2.87	2.52	1.96	1.39	1.51	1.28	1.02	0.95	-62.2%
Hong Kong, China	0.38	0.35	0.27	0.31	0.32	0.27	0.26	0.22	0.18	0.17	0.17	-48.1%
China	3.51	3.71	3.48	2.58	2.27	1.82	1.31	1.45	1.24	1.00	0.93	-59.0%
Argentina	0.46	0.43	0.42	0.44	0.51	0.44	0.46	0.45	0.41	0.42	0.43	-16.2%
Bolivia	0.33	0.39	0.46	0.52	0.55	0.61	0.53	0.58	0.70	0.71	0.76	36.5%
Brazil	0.18	0.18	0.17	0.15	0.16	0.16	0.19	0.18	0.17	0.19	0.19	19.4%
Colombia	0.41	0.35	0.33	0.34	0.31	0.30	0.28	0.23	0.21	0.22	0.24	-23.9%
Costa Rica	0.17	0.19	0.18	0.16	0.17	0.22	0.18	0.18	0.18	0.15	0.16	-7.0%
Cuba	0.98	0.95	1.02	0.71	0.76	0.72	0.71	0.51	0.46	0.36	0.30	-60.4%
Curacao ¹	13.75	8.53	6.31	3.09	1.55	1.37	2.40	2.39	1.63	2.52	2.24	44.1%
Dominican Republic	0.43	0.46	0.43	0.39	0.40	0.47	0.53	0.44	0.35	0.31	0.30	-23.8%
Ecuador	0.22	0.25	0.35	0.35	0.35	0.38	0.39	0.41	0.46	0.42	0.41	17.1%
El Salvador	0.13	0.16	0.14	0.16	0.19	0.30	0.29	0.31	0.27	0.27	0.28	50.5%
Guatemala	0.20	0.22	0.23	0.19	0.16	0.24	0.29	0.31	0.25	0.30	0.32	96.3%
Haiti	0.08	0.08	0.10	0.12	0.15	0.16	0.21	0.31	0.32	0.41	0.41	179.6%
Honduras	0.30	0.31	0.28	0.26	0.29	0.39	0.43	0.54	0.47	0.49	0.47	64.6%
Jamaica	0.63	0.79	0.82	0.58	0.70	0.67	0.79	0.76	0.53	0.51	0.52	-25.3%
Nicaragua	0.28	0.28	0.33	0.32	0.39	0.49	0.54	0.52	0.49	0.45	0.44	13.6%
Panama	0.44	0.48	0.34	0.26	0.26	0.32	0.30	0.33	0.31	0.25	0.23	-11.2%
Paraguay	0.17	0.16	0.18	0.17	0.17	0.25	0.23	0.22	0.23	0.22	0.24	42.1%
Peru	0.33	0.31	0.32	0.28	0.33	0.31	0.31	0.27	0.28	0.26	0.27	-19.0%
Suriname	..	..	..	..	..	..	0.54	0.47	0.39	0.43	0.45	..
Trinidad and Tobago	0.78	0.59	0.62	0.74	0.99	0.95	0.82	0.96	1.01	0.95	0.98	-0.9%
Uruguay	0.32	0.31	0.25	0.17	0.17	0.17	0.17	0.17	0.15	0.13	0.13	-22.0%
Venezuela	0.27	0.29	0.39	0.41	0.40	0.38	0.40	0.42	0.44	0.36	0.39	-1.3%
Other non-OECD Americas	0.50	0.63	0.46	0.40	0.42	0.43	0.40	0.38	0.42	0.47	0.47	11.5%
Non-OECD Americas	0.30	0.28	0.28	0.26	0.26	0.26	0.28	0.27	0.26	0.26	0.26	-1.1%
Bahrain	1.15	1.12	0.95	1.28	1.20	1.09	1.04	1.05	0.99	0.98	0.94	-22.1%
Islamic Republic of Iran	0.21	0.29	0.54	0.72	0.83	1.03	1.11	1.13	1.07	1.21	1.16	38.9%
Iraq	0.67	0.72	0.57	0.93	0.74	2.03	0.69	0.70	0.75	0.68	0.66	-10.2%
Jordan	0.39	0.63	0.60	0.81	1.06	1.00	0.99	0.92	0.71	0.79	0.77	-26.7%
Kuwait	0.23	0.30	0.50	0.89	0.68	0.48	0.63	0.59	0.67	0.65	0.63	-7.9%
Lebanon	0.27	0.34	0.46	0.33	0.48	0.63	0.64	0.55	0.48	0.55	0.55	14.7%
Oman	0.04	0.08	0.20	0.24	0.38	0.41	0.48	0.57	0.72	0.89	0.86	127.4%
Qatar	0.12	0.25	0.31	0.56	0.66	0.79	0.59	0.62	0.44	0.47	0.46	-29.6%
Saudi Arabia	0.08	0.09	0.28	0.57	0.51	0.55	0.62	0.65	0.79	0.78	0.76	48.6%
Syrian Arab Republic	0.67	0.60	0.65	0.91	1.13	0.86	0.96	1.13	0.95	1.53	1.70	51.1%
United Arab Emirates	0.11	0.09	0.16	0.32	0.41	0.46	0.40	0.43	0.53	0.51	0.51	22.5%
Yemen	0.43	0.44	0.50	0.49	0.54	0.60	0.66	0.75	0.72	0.55	0.49	-8.4%
Middle East	0.19	0.22	0.37	0.61	0.63	0.74	0.72	0.75	0.78	0.79	0.77	21.8%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions / GDP using purchasing power paritieskilogrammes CO₂ / US dollar using 2010 prices

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
World ¹	0.59	0.55	0.52	0.47	0.45	0.42	0.38	0.36	0.34	0.31	0.30	-33.5%
<i>Annex I Parties</i>	..	..	..	..	0.45	0.41	0.37	0.33	0.30	0.26	0.25	-44.8%
<i>Annex II Parties</i>	0.62	0.57	0.51	0.43	0.39	0.36	0.34	0.31	0.28	0.24	0.23	-39.4%
<i>North America</i>	0.86	0.79	0.70	0.58	0.53	0.49	0.45	0.40	0.36	0.30	0.29	-44.7%
<i>Europe</i>	0.47	0.42	0.39	0.33	0.29	0.26	0.23	0.22	0.20	0.17	0.16	-44.4%
<i>Asia Oceania</i>	0.47	0.46	0.39	0.32	0.31	0.31	0.30	0.29	0.27	0.26	0.26	-15.9%
<i>Annex I EIT</i>	..	..	..	..	0.84	0.85	0.69	0.53	0.46	0.38	0.38	-54.7%
<i>Non-Annex I Parties</i>	..	..	..	..	0.39	0.39	0.35	0.37	0.36	0.33	0.31	-20.0%
<i>Annex B Kyoto Parties</i>	..	..	..	..	0.40	0.34	0.29	0.27	0.24	0.20	0.20	-50.4%
Non-OECD Total	0.48	0.49	0.49	0.49	0.50	0.46	0.40	0.40	0.38	0.34	0.32	-34.8%
OECD Total	0.61	0.56	0.51	0.44	0.39	0.37	0.34	0.31	0.28	0.24	0.24	-39.5%
Canada	0.74	0.69	0.64	0.52	0.49	0.48	0.46	0.42	0.39	0.36	0.35	-28.4%
Chile	0.35	0.33	0.29	0.25	0.28	0.23	0.24	0.21	0.22	0.22	0.22	-18.5%
Mexico	0.19	0.21	0.23	0.25	0.24	0.25	0.24	0.26	0.25	0.22	0.22	-11.2%
United States	0.87	0.80	0.70	0.59	0.53	0.49	0.45	0.40	0.36	0.30	0.29	-46.0%
OECD Americas	0.80	0.73	0.64	0.55	0.50	0.47	0.43	0.38	0.35	0.29	0.28	-43.3%
Australia	0.51	0.57	0.57	0.52	0.53	0.50	0.48	0.45	0.41	0.35	0.36	-33.0%
Israel ²	0.33	0.31	0.30	0.34	0.37	0.36	0.34	0.33	0.31	0.25	0.23	-35.9%
Japan	0.47	0.44	0.37	0.30	0.28	0.28	0.27	0.26	0.25	0.24	0.24	-13.9%
Korea	0.60	0.60	0.65	0.51	0.46	0.48	0.44	0.37	0.37	0.33	0.33	-29.3%
New Zealand	0.25	0.26	0.25	0.25	0.28	0.27	0.28	0.27	0.22	0.20	0.19	-34.3%
OECD Asia Oceania	0.47	0.46	0.41	0.34	0.33	0.33	0.32	0.31	0.29	0.28	0.28	-15.6%
Austria	0.35	0.31	0.29	0.26	0.24	0.23	0.21	0.23	0.19	0.17	0.17	-30.7%
Belgium	0.65	0.55	0.51	0.39	0.36	0.35	0.31	0.26	0.24	0.20	0.20	-44.7%
Czech Republic	1.10	0.97	0.94	0.94	0.74	0.63	0.57	0.46	0.39	0.32	0.31	-57.8%
Denmark	0.48	0.43	0.46	0.39	0.30	0.31	0.23	0.21	0.20	0.13	0.13	-56.7%
Estonia	..	..	..	..	1.59	1.02	0.69	0.57	0.65	0.44	0.47	-70.7%
Finland	0.55	0.50	0.53	0.41	0.38	0.41	0.31	0.28	0.30	0.20	0.22	-43.9%
France	0.43	0.38	0.35	0.25	0.21	0.19	0.18	0.17	0.15	0.12	0.12	-42.4%
Germany	0.66	0.60	0.55	0.49	0.39	0.32	0.28	0.26	0.24	0.21	0.21	-47.0%
Greece	0.19	0.22	0.23	0.28	0.34	0.35	0.33	0.30	0.27	0.25	0.25	-27.0%
Hungary	0.60	0.55	0.54	0.48	0.38	0.37	0.30	0.25	0.22	0.18	0.18	-52.6%
Iceland	0.42	0.40	0.32	0.27	0.27	0.27	0.23	0.19	0.16	0.15	0.14	-48.7%
Ireland	0.64	0.51	0.50	0.45	0.41	0.35	0.28	0.23	0.20	0.13	0.13	-69.2%
Italy	0.31	0.29	0.26	0.23	0.23	0.22	0.21	0.22	0.19	0.16	0.16	-29.8%
Latvia	..	..	..	..	0.54	0.45	0.27	0.20	0.22	0.16	0.15	-71.6%
Luxembourg	1.70	1.17	1.02	0.75	0.55	0.33	0.24	0.30	0.25	0.18	0.16	-69.9%
Netherlands	0.44	0.40	0.39	0.35	0.31	0.31	0.25	0.24	0.23	0.20	0.20	-36.6%
Norway	0.26	0.23	0.21	0.17	0.16	0.16	0.13	0.13	0.14	0.12	0.11	-29.6%
Poland	1.00	0.93	1.09	1.10	0.91	0.79	0.53	0.47	0.38	0.30	0.31	-66.3%
Portugal	0.15	0.16	0.16	0.16	0.19	0.22	0.22	0.22	0.17	0.17	0.17	-10.1%
Slovak Republic	0.74	0.72	0.84	0.76	0.71	0.59	0.44	0.35	0.26	0.19	0.19	-73.0%
Slovenia	..	..	..	..	0.37	0.40	0.32	0.30	0.27	0.22	0.23	-38.6%
Spain	0.24	0.25	0.27	0.24	0.22	0.23	0.23	0.24	0.18	0.17	0.16	-29.6%
Sweden	0.48	0.41	0.35	0.26	0.20	0.21	0.16	0.14	0.12	0.09	0.09	-58.1%
Switzerland	0.17	0.16	0.16	0.16	0.13	0.13	0.12	0.12	0.10	0.08	0.08	-37.1%
Turkey	0.16	0.19	0.20	0.21	0.22	0.22	0.24	0.20	0.21	0.18	0.18	-14.8%
United Kingdom	0.65	0.57	0.50	0.43	0.36	0.31	0.27	0.24	0.21	0.16	0.15	-59.7%
OECD Europe	0.50	0.45	0.43	0.37	0.32	0.29	0.25	0.24	0.21	0.18	0.17	-45.8%
<i>IEA/Accession/Association</i>	0.59	0.55	0.50	0.44	0.41	0.39	0.35	0.35	0.33	0.30	0.28	-29.9%
<i>European Union - 28</i>	..	..	..	..	0.34	0.31	0.26	0.25	0.22	0.18	0.18	-48.8%
<i>G20</i>	..	..	..	..	0.45	0.42	0.38	0.37	0.35	0.31	0.30	-33.3%
<i>Africa</i>	0.20	0.23	0.23	0.25	0.25	0.26	0.24	0.25	0.22	0.21	0.21	-15.9%
<i>Americas</i>	0.67	0.60	0.53	0.46	0.43	0.40	0.38	0.34	0.31	0.26	0.26	-40.1%
<i>Asia</i>	0.41	0.41	0.42	0.41	0.43	0.42	0.38	0.41	0.39	0.35	0.33	-22.4%
<i>Europe</i>	0.53	0.48	0.45	0.39	0.46	0.39	0.33	0.30	0.27	0.23	0.22	-51.6%
<i>Oceania</i>	0.46	0.51	0.51	0.47	0.49	0.45	0.45	0.42	0.38	0.33	0.33	-31.9%

1. The ratio for the world has been calculated to include international marine bunkers and international aviation bunkers.

2. Please refer to the chapter Geographical coverage.

CO₂ emissions / GDP using purchasing power paritieskilogrammes CO₂ / US dollar using 2010 prices

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Non-OECD Total	0.48	0.49	0.49	0.49	0.50	0.46	0.40	0.40	0.38	0.34	0.32	-34.8%
Albania	0.50	0.45	0.53	0.49	0.38	0.14	0.18	0.17	0.14	0.13	0.12	-69.1%
Armenia	..	..	..	..	1.53	0.49	0.39	0.26	0.21	0.20	0.21	-86.4%
Azerbaijan	..	..	..	..	0.90	1.30	0.78	0.44	0.17	0.20	0.21	-77.1%
Belarus	..	..	..	..	1.20	1.05	0.71	0.52	0.39	0.33	0.34	-71.6%
Bosnia and Herzegovina	..	..	..	..	3.49	0.49	0.60	0.53	0.59	0.52	0.58	-83.5%
Bulgaria	1.88	1.58	1.36	1.12	0.94	0.76	0.59	0.49	0.40	0.37	0.33	-65.2%
Croatia	..	..	..	..	0.30	0.26	0.25	0.24	0.22	0.19	0.19	-37.7%
Cyprus ¹	0.50	0.40	0.36	0.29	0.29	0.30	0.31	0.29	0.26	0.23	0.24	-18.4%
FYR of Macedonia	..	..	..	..	0.45	0.55	0.49	0.46	0.36	0.27	0.26	-43.1%
Georgia	..	..	..	..	0.89	0.76	0.33	0.20	0.19	0.26	0.26	-70.6%
Gibraltar	0.18	0.15	0.21	0.18	0.25	0.45	0.44	0.46	0.52	0.59	0.60	143.1%
Kazakhstan	..	..	..	..	1.14	1.33	0.77	0.66	0.69	0.56	0.56	-50.4%
Kosovo	..	..	..	..	..	..	0.67	0.60	0.64	0.54	0.55	..
Kyrgyzstan	..	..	..	..	1.52	0.59	0.45	0.41	0.41	0.52	0.47	-68.9%
Lithuania	..	..	..	..	0.71	0.41	0.25	0.21	0.20	0.14	0.14	-80.2%
Malta	0.43	0.29	0.26	0.28	0.41	0.32	0.23	0.25	0.22	0.11	0.09	-78.6%
Republic of Moldova	..	..	..	..	1.30	1.27	0.79	0.67	0.58	0.46	0.45	-65.6%
Montenegro	..	..	..	..	..	..	0.29	0.31	0.26	0.22	0.22	..
Romania	1.04	0.84	0.74	0.62	0.66	0.51	0.38	0.31	0.22	0.18	0.17	-74.7%
Russian Federation	..	..	..	..	0.80	0.92	0.81	0.60	0.52	0.46	0.45	-43.2%
Serbia	..	..	..	..	1.13	0.83	0.75	0.64	0.52	0.50	0.49	-56.3%
Tajikistan	..	..	..	..	0.58	0.34	0.30	0.21	0.15	0.19	0.20	-65.4%
Turkmenistan	..	..	..	..	1.49	1.75	1.55	1.59	1.15	0.85	0.79	-46.6%
Ukraine	..	..	..	..	1.29	1.55	1.28	0.87	0.76	0.60	0.62	-52.3%
Uzbekistan	..	..	..	..	1.86	1.89	1.89	1.36	0.82	0.51	0.45	-75.7%
Former Soviet Union	0.96	0.98	0.95	0.90	..	..	..	..	..	..	..	..
Former Yugoslavia	0.49	0.48	0.40	0.56	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia	0.95	0.96	0.91	0.86	0.90	0.95	0.79	0.60	0.51	0.43	0.43	-52.5%
Algeria	0.09	0.09	0.14	0.17	0.20	0.21	0.20	0.19	0.21	0.24	0.23	16.8%
Angola	0.04	0.05	0.07	0.06	0.08	0.09	0.08	0.08	0.11	0.12	0.12	54.7%
Benin	0.08	0.11	0.08	0.07	0.04	0.03	0.13	0.20	0.28	0.26	0.27	638.9%
Botswana	..	..	..	0.24	0.26	0.23	0.23	0.20	0.12	0.21	0.20	-21.5%
Cameroon	0.05	0.05	0.06	0.06	0.08	0.08	0.07	0.06	0.09	0.08	0.08	5.3%
Congo	0.13	0.10	0.09	0.06	0.05	0.04	0.04	0.05	0.08	0.10	0.10	92.3%
Côte d'Ivoire	0.10	0.10	0.10	0.08	0.07	0.08	0.13	0.12	0.12	0.13	0.13	85.7%
Dem. Rep. of the Congo	0.06	0.06	0.08	0.08	0.07	0.04	0.04	0.04	0.05	0.05	0.03	-50.7%
Egypt	0.19	0.21	0.21	0.24	0.23	0.21	0.20	0.24	0.22	0.22	0.21	-9.4%
Eritrea	..	..	..	..	..	0.16	0.11	0.09	0.08	0.08	0.08	..
Ethiopia	0.05	0.05	0.05	0.06	0.07	0.07	0.08	0.08	0.07	0.07	0.07	-4.2%
Gabon	0.06	0.05	0.09	0.10	0.05	0.06	0.07	0.08	0.11	0.10	0.10	106.0%
Ghana	0.09	0.11	0.10	0.10	0.09	0.10	0.12	0.12	0.14	0.13	0.12	26.1%
Kenya	0.16	0.13	0.12	0.11	0.10	0.10	0.12	0.10	0.11	0.11	0.11	11.9%
Libya	0.03	0.08	0.10	0.17	0.23	0.30	0.32	0.29	0.27	0.89	0.96	318.7%
Mauritius	0.10	0.13	0.13	0.11	0.15	0.16	0.19	0.20	0.19	0.17	0.17	9.9%
Morocco	0.17	0.21	0.23	0.22	0.20	0.25	0.23	0.24	0.22	0.22	0.22	5.9%
Mozambique	0.52	0.50	0.48	0.40	0.22	0.20	0.13	0.10	0.11	0.17	0.23	2.7%
Namibia	..	..	..	..	..	0.19	0.17	0.17	0.17	0.16	0.17	..
Niger	..	..	..	..	..	..	0.08	0.07	0.10	0.11	0.11	..
Nigeria	0.03	0.04	0.08	0.12	0.10	0.11	0.13	0.10	0.07	0.08	0.09	-12.1%
Senegal	0.14	0.16	0.19	0.18	0.16	0.16	0.19	0.20	0.20	0.22	0.23	45.5%
South Africa	0.68	0.77	0.68	0.68	0.68	0.70	0.66	0.72	0.68	0.61	0.62	-9.7%
South Sudan	..	..	..	..	..	..	..	..	..	0.10	0.08	..
Sudan	0.13	0.10	0.11	0.11	0.12	0.08	0.07	0.10	0.10	0.10	0.11	-7.5%
United Rep. of Tanzania	0.08	0.07	0.06	0.05	0.05	0.06	0.05	0.07	0.07	0.09	0.08	66.0%
Togo	0.12	0.09	0.08	0.07	0.12	0.12	0.15	0.15	0.27	0.19	0.19	65.2%
Tunisia	0.22	0.21	0.25	0.25	0.27	0.26	0.25	0.22	0.21	0.22	0.21	-21.9%
Zambia	0.23	0.27	0.20	0.16	0.14	0.11	0.08	0.07	0.04	0.06	0.06	-56.1%
Zimbabwe	0.53	0.45	0.47	0.47	0.63	0.55	0.43	0.49	0.46	0.40	0.35	-44.5%
Other Africa	0.08	0.09	0.11	0.09	0.09	0.10	0.10	0.08	0.08	0.08	0.08	-12.0%
Africa	0.20	0.23	0.23	0.25	0.25	0.26	0.24	0.25	0.22	0.21	0.21	-15.9%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions / GDP using purchasing power paritieskilogrammes CO₂ / US dollar using 2010 prices

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Bangladesh	0.04	0.06	0.07	0.07	0.09	0.10	0.10	0.12	0.14	0.14	0.14	62.4%
Brunei Darussalam	0.03	0.09	0.10	0.14	0.15	0.18	0.17	0.16	0.22	0.20	0.21	39.5%
Cambodia	..	..	..	..	..	0.13	0.12	0.10	0.13	0.16	0.17	..
DPR of Korea	2.23	1.61	1.29	0.96	0.73	0.61	0.63	0.70	0.49	0.22	0.25	-65.7%
India	0.28	0.29	0.30	0.34	0.35	0.37	0.34	0.30	0.30	0.28	0.26	-25.7%
Indonesia	0.10	0.12	0.14	0.14	0.16	0.18	0.21	0.21	0.18	0.17	0.17	1.2%
Malaysia	0.25	0.23	0.23	0.25	0.27	0.27	0.31	0.33	0.33	0.29	0.28	3.8%
Mongolia	..	..	..	1.29	1.17	1.07	0.82	0.73	0.69	0.51	0.53	-54.5%
Myanmar	0.26	0.21	0.20	0.17	0.13	0.17	0.16	0.10	0.04	0.07	0.08	-41.7%
Nepal	0.02	0.03	0.04	0.03	0.04	0.06	0.09	0.07	0.08	0.09	0.13	217.1%
Pakistan	0.14	0.15	0.14	0.15	0.17	0.20	0.20	0.19	0.18	0.17	0.17	-4.0%
Philippines	0.20	0.19	0.16	0.15	0.16	0.21	0.21	0.18	0.15	0.15	0.16	0.6%
Singapore	0.26	0.26	0.26	0.25	0.28	0.24	0.21	0.15	0.12	0.10	0.10	-64.3%
Sri Lanka	0.10	0.08	0.09	0.07	0.06	0.07	0.10	0.11	0.07	0.09	0.09	46.7%
Chinese Taipei	0.49	0.44	0.44	0.36	0.37	0.36	0.37	0.36	0.30	0.25	0.26	-29.7%
Thailand	0.17	0.18	0.20	0.19	0.22	0.26	0.27	0.27	0.25	0.24	0.23	5.5%
Viet Nam	0.31	0.32	0.27	0.23	0.18	0.19	0.22	0.28	0.33	0.33	0.35	93.3%
Other non-OECD Asia	0.23	0.24	0.27	0.16	0.15	0.12	0.13	0.13	0.13	0.17	0.23	54.1%
Asia (excl. China)	0.25	0.26	0.26	0.27	0.27	0.27	0.28	0.26	0.25	0.23	0.23	-17.0%
People's Rep. of China	1.91	2.02	1.95	1.40	1.23	0.96	0.68	0.74	0.62	0.50	0.47	-62.1%
Hong Kong, China	0.26	0.24	0.19	0.22	0.22	0.19	0.18	0.15	0.13	0.12	0.11	-48.4%
China	1.77	1.88	1.77	1.31	1.15	0.91	0.65	0.72	0.61	0.49	0.46	-60.0%
Argentina	0.26	0.24	0.24	0.25	0.29	0.25	0.26	0.25	0.23	0.23	0.24	-16.4%
Bolivia	0.12	0.15	0.17	0.19	0.21	0.23	0.20	0.22	0.26	0.27	0.28	36.2%
Brazil	0.14	0.14	0.13	0.12	0.12	0.13	0.15	0.14	0.13	0.15	0.15	19.7%
Colombia	0.24	0.21	0.20	0.20	0.18	0.18	0.17	0.14	0.12	0.13	0.14	-24.3%
Costa Rica	0.11	0.12	0.12	0.11	0.11	0.14	0.12	0.12	0.11	0.10	0.10	-7.3%
Cuba	0.32	0.31	0.33	0.23	0.25	0.23	0.23	0.16	0.15	0.12	0.10	-60.6%
Curacao ¹	15.33	9.51	7.03	3.45	1.73	1.53	2.68	2.66	1.82	2.80	2.50	44.2%
Dominican Republic	0.21	0.23	0.22	0.19	0.20	0.23	0.26	0.22	0.18	0.16	0.15	-24.0%
Ecuador	0.11	0.13	0.18	0.18	0.18	0.19	0.20	0.21	0.23	0.22	0.21	17.4%
El Salvador	0.07	0.08	0.07	0.08	0.09	0.15	0.14	0.15	0.13	0.13	0.14	51.1%
Guatemala	0.09	0.09	0.10	0.08	0.07	0.10	0.12	0.13	0.11	0.13	0.14	97.1%
Haiti	0.04	0.04	0.04	0.06	0.07	0.07	0.10	0.14	0.14	0.19	0.19	180.3%
Honduras	0.15	0.16	0.14	0.13	0.14	0.20	0.21	0.27	0.24	0.24	0.23	65.2%
Jamaica	0.38	0.48	0.49	0.34	0.42	0.40	0.47	0.46	0.31	0.31	0.31	-25.3%
Nicaragua	0.11	0.11	0.13	0.13	0.15	0.19	0.21	0.20	0.19	0.17	0.17	13.2%
Panama	0.23	0.25	0.18	0.14	0.14	0.17	0.16	0.18	0.16	0.13	0.12	-11.1%
Paraguay	0.08	0.07	0.08	0.08	0.08	0.11	0.10	0.10	0.11	0.10	0.11	42.9%
Peru	0.17	0.16	0.16	0.14	0.17	0.16	0.16	0.14	0.14	0.14	0.14	-18.9%
Suriname	..	..	..	..	..	..	0.32	0.28	0.23	0.26	0.25	..
Trinidad and Tobago	0.43	0.32	0.34	0.41	0.54	0.52	0.44	0.52	0.55	0.52	0.52	-3.9%
Uruguay	0.23	0.22	0.18	0.12	0.12	0.12	0.12	0.12	0.11	0.10	0.09	-21.7%
Venezuela	0.23	0.24	0.32	0.34	0.33	0.32	0.34	0.35	0.36	0.30	0.33	-1.5%
Other non-OECD Americas	0.46	0.59	0.44	0.38	0.41	0.41	0.40	0.38	0.42	0.46	0.46	13.8%
Non-OECD Americas	0.20	0.19	0.19	0.17	0.18	0.18	0.19	0.18	0.18	0.18	0.17	-3.9%
Bahrain	0.60	0.58	0.50	0.67	0.63	0.57	0.54	0.55	0.52	0.51	0.49	-22.0%
Islamic Republic of Iran	0.08	0.10	0.19	0.26	0.28	0.35	0.38	0.39	0.38	0.43	0.39	37.2%
Iraq	0.24	0.26	0.21	0.34	0.27	0.73	0.25	0.25	0.27	0.25	0.24	-10.2%
Jordan	0.15	0.25	0.24	0.32	0.42	0.40	0.39	0.36	0.28	0.31	0.31	-26.7%
Kuwait	0.12	0.16	0.26	0.46	0.36	0.25	0.33	0.31	0.35	0.34	0.33	-7.6%
Lebanon	0.14	0.18	0.25	0.18	0.27	0.35	0.35	0.30	0.26	0.30	0.30	12.1%
Oman	0.02	0.04	0.09	0.11	0.16	0.18	0.21	0.25	0.31	0.39	0.37	127.6%
Qatar	0.07	0.14	0.18	0.32	0.38	0.46	0.34	0.36	0.25	0.27	0.27	-29.4%
Saudi Arabia	0.04	0.04	0.12	0.25	0.22	0.24	0.27	0.28	0.34	0.34	0.33	48.6%
Syrian Arab Republic	0.31	0.27	0.30	0.41	0.51	0.39	0.43	0.51	0.43	0.69	0.77	51.0%
United Arab Emirates	0.07	0.05	0.10	0.20	0.26	0.29	0.25	0.27	0.33	0.32	0.32	23.0%
Yemen	0.13	0.13	0.15	0.15	0.16	0.18	0.20	0.23	0.22	0.16	0.15	-8.1%
Middle East	0.08	0.09	0.16	0.26	0.27	0.32	0.31	0.32	0.34	0.35	0.33	25.2%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions / populationtonnes CO₂ / capita

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
World ¹	3.71	3.81	3.99	3.77	3.89	3.75	3.80	4.16	4.41	4.40	4.35	11.9%
<i>Annex I Parties</i>	..	..	..	..	11.66	10.75	11.05	11.03	10.28	9.40	9.29	-20.3%
<i>Annex II Parties</i>	12.16	12.12	12.47	11.69	12.07	12.12	12.78	12.59	11.44	10.38	10.21	-15.4%
<i>North America</i>	20.16	19.79	19.89	18.57	18.80	18.67	19.95	19.02	17.11	15.30	14.94	-20.5%
<i>Europe</i>	8.58	8.48	8.99	8.23	8.24	8.03	8.12	8.19	7.29	6.32	6.23	-24.4%
<i>Asia Oceania</i>	7.50	8.12	8.10	7.88	9.14	9.65	9.92	10.30	9.85	10.03	10.05	10.0%
<i>Annex I EIT</i>	..	..	..	..	12.24	8.74	8.00	8.30	8.40	7.72	7.71	-37.0%
<i>Non-Annex I Parties</i>	..	..	..	..	1.50	1.71	1.79	2.33	2.87	3.11	3.08	105.1%
<i>Annex B Kyoto Parties</i>	..	..	..	..	9.20	8.12	7.86	8.13	7.58	6.66	6.66	-27.7%
Non-OECD Total	1.43	1.67	1.90	1.93	2.11	2.00	1.99	2.49	3.00	3.20	3.17	50.4%
OECD Total	10.40	10.39	10.75	10.08	10.27	10.30	10.83	10.72	9.95	9.12	9.02	-12.1%
Canada	15.49	16.30	17.22	15.24	15.15	15.32	16.82	16.75	15.57	15.12	14.91	-1.6%
Chile	2.16	1.64	1.92	1.62	2.23	2.58	3.16	3.34	4.01	4.50	4.67	109.0%
Mexico	1.75	2.21	2.91	3.06	2.95	3.08	3.57	3.85	3.86	3.66	3.64	23.4%
United States	20.65	20.17	20.18	18.93	19.20	19.03	20.29	19.27	17.28	15.32	14.95	-22.2%
OECD Americas	16.20	15.74	15.71	14.55	14.57	14.46	15.50	14.86	13.45	12.07	11.80	-19.0%
Australia	10.86	12.85	13.96	13.84	15.03	15.66	17.36	18.18	17.42	15.72	16.00	6.5%
Israel ²	4.52	4.75	4.86	5.74	7.04	8.09	8.70	8.45	8.98	7.69	7.46	6.0%
Japan	7.15	7.60	7.44	7.16	8.39	8.86	8.87	9.11	8.62	9.07	9.04	7.7%
Korea	1.61	2.20	3.30	3.82	5.41	7.92	9.19	9.50	11.12	11.41	11.50	112.6%
New Zealand	4.71	5.32	5.24	5.78	6.45	6.48	7.50	8.13	6.97	6.76	6.45	0.1%
OECD Asia Oceania	6.21	6.80	7.00	6.94	8.25	9.21	9.72	10.05	10.11	10.27	10.29	24.7%
Austria	6.48	6.53	7.20	6.96	7.33	7.49	7.72	9.04	8.17	7.24	7.20	-1.8%
Belgium	12.21	11.81	12.74	10.25	10.66	10.99	11.10	10.25	9.51	8.24	8.11	-24.0%
Czech Republic	15.61	15.40	16.27	16.95	14.49	11.92	11.80	11.57	10.70	9.45	9.60	-33.8%
Denmark	11.17	10.40	12.31	11.94	9.92	11.16	9.52	8.95	8.52	5.62	5.84	-41.1%
Estonia	..	..	..	..	22.06	10.97	10.31	12.32	13.93	11.51	12.44	-43.6%
Finland	8.64	9.38	11.48	9.85	10.80	10.91	10.55	10.47	11.56	7.74	8.28	-23.3%
France	8.07	7.85	8.25	6.21	5.94	5.78	5.99	5.89	5.25	4.39	4.38	-26.2%
Germany	12.49	12.37	13.39	12.93	11.84	10.54	9.97	9.67	9.45	8.93	8.88	-25.0%
Greece	2.81	3.73	4.64	5.43	6.81	7.24	8.14	8.66	7.50	5.97	5.85	-14.0%
Hungary	5.81	6.66	7.72	7.54	6.34	5.45	5.22	5.43	4.72	4.34	4.48	-29.4%
Iceland	6.82	7.40	7.66	6.76	7.44	7.36	7.69	7.55	6.13	6.22	6.16	-17.1%
Ireland	7.27	6.66	7.61	7.47	8.59	9.06	10.76	10.67	8.67	7.62	7.87	-8.3%
Italy	5.35	5.72	6.30	6.04	6.87	7.06	7.38	7.84	6.55	5.43	5.37	-21.8%
Latvia	..	..	..	..	7.05	3.58	2.89	3.39	3.86	3.46	3.47	-50.8%
Luxembourg	48.16	35.49	34.20	28.16	28.13	20.06	18.44	24.64	20.96	15.49	14.51	-48.4%
Netherlands	9.68	9.66	10.28	9.55	9.89	10.58	10.15	10.25	10.24	9.22	9.23	-6.7%
Norway	5.89	5.89	6.67	6.36	6.48	7.21	7.10	7.46	7.85	6.95	6.78	4.7%
Poland	8.76	9.96	11.69	11.35	9.07	8.71	7.57	7.76	7.98	7.35	7.63	-15.9%
Portugal	1.65	1.96	2.41	2.37	3.79	4.71	5.62	5.85	4.50	4.54	4.59	21.0%
Slovak Republic	8.53	9.11	11.20	10.54	10.35	7.69	6.83	6.92	6.37	5.43	5.56	-46.2%
Slovenia	..	..	..	..	6.77	7.07	7.06	7.72	7.54	6.21	6.58	-2.8%
Spain	3.44	4.33	4.90	4.45	5.15	5.75	6.87	7.64	5.63	5.32	5.14	-0.3%
Sweden	10.13	9.65	8.80	6.99	6.09	6.45	5.86	5.44	4.91	3.79	3.83	-37.1%
Switzerland	6.14	5.74	6.15	6.39	6.00	5.84	5.79	5.88	5.51	4.51	4.53	-24.4%
Turkey	1.15	1.49	1.61	1.90	2.34	2.58	3.13	3.15	3.67	4.12	4.33	85.3%
United Kingdom	11.11	10.25	10.13	9.61	9.60	8.86	8.84	8.80	7.60	6.04	5.65	-41.1%
OECD Europe	8.08	8.10	8.65	8.01	7.80	7.46	7.45	7.50	6.88	6.11	6.10	-21.9%
<i>IEA/Accession/Association</i>	4.01	4.00	4.14	3.89	4.00	4.19	4.34	4.83	5.19	5.26	5.20	30.0%
<i>European Union - 28</i>	..	..	..	..	8.43	7.89	7.77	7.92	7.17	6.29	6.24	-25.9%
<i>G20</i>	..	..	..	..	4.59	4.55	4.66	5.15	5.52	5.59	5.52	20.2%
<i>Africa</i>	0.67	0.78	0.83	0.85	0.84	0.80	0.81	0.93	0.95	0.96	0.95	12.6%
<i>Americas</i>	9.74	9.44	9.37	8.48	8.40	8.35	8.92	8.56	7.93	7.26	7.08	-15.8%
<i>Asia</i>	1.01	1.16	1.34	1.45	1.84	2.12	2.20	2.87	3.57	3.95	3.93	114.4%
<i>Europe</i>	8.49	8.58	9.27	8.63	9.93	8.18	7.92	8.12	7.67	6.83	6.78	-31.7%
<i>Oceania</i>	8.07	9.42	10.00	9.89	10.68	10.91	11.99	12.50	11.82	10.79	10.92	2.2%

1. The ratio for the world has been calculated to include international marine bunkers and international aviation bunkers.

2. Please refer to the chapter Geographical coverage.

CO₂ emissions / populationtonnes CO₂ / capita

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Non-OECD Total	1.43	1.67	1.90	1.93	2.11	2.00	1.99	2.49	3.00	3.20	3.17	50.4%
Albania	1.77	1.80	2.55	2.34	1.73	0.58	1.00	1.27	1.35	1.33	1.28	-26.0%
Armenia	..	..	..	..	5.61	1.05	1.12	1.39	1.41	1.61	1.67	-70.3%
Azerbaijan	..	..	..	..	7.47	4.21	3.39	3.46	2.60	3.19	3.22	-56.9%
Belarus	..	..	..	..	9.80	5.59	5.22	5.69	6.27	5.55	5.59	-43.0%
Bosnia and Herzegovina	..	..	..	..	5.37	0.85	3.64	4.19	5.50	5.44	6.24	16.3%
Bulgaria	7.48	8.41	9.60	9.17	8.55	6.27	5.16	6.07	6.00	6.10	5.68	-33.5%
Croatia	..	..	..	..	4.25	3.17	3.79	4.48	4.13	3.69	3.80	-10.6%
Cyprus ¹	2.83	3.28	5.09	5.14	6.79	7.83	9.14	9.62	8.87	6.97	7.39	8.9%
FYR of Macedonia	..	..	..	..	4.30	4.19	4.19	4.33	4.02	3.43	3.32	-22.9%
Georgia	..	..	..	..	6.97	1.72	1.05	0.97	1.27	2.26	2.37	-66.0%
Gibraltar	2.64	2.39	3.34	3.22	5.10	9.68	11.73	13.09	15.30	17.34	18.99	272.4%
Kazakhstan	..	..	..	..	14.51	10.78	7.53	10.36	13.55	12.83	12.92	-11.0%
Kosovo	..	..	..	..	..	..	3.00	3.89	4.90	4.78	5.00	..
Kyrgyzstan	..	..	..	..	5.18	0.98	0.91	0.95	1.11	1.66	1.53	-70.5%
Lithuania	..	..	..	..	8.71	3.70	2.92	3.75	3.98	3.63	3.75	-57.0%
Malta	2.16	2.14	3.13	3.45	6.54	6.31	5.46	6.49	6.22	3.81	3.10	-52.6%
Republic of Moldova	..	..	..	..	8.26	3.24	1.80	2.17	2.22	2.13	2.17	-73.7%
Montenegro	..	..	..	..	..	..	..	3.27	4.18	3.79	3.39	..
Romania	5.60	6.60	7.97	7.69	7.25	5.18	3.84	4.35	3.69	3.51	3.45	-52.5%
Russian Federation	..	..	..	..	14.59	10.44	10.06	10.33	10.71	10.18	9.97	-31.7%
Serbia	..	..	..	..	6.16	4.34	5.29	6.65	6.29	6.27	6.44	4.7%
Tajikistan	..	..	..	..	2.09	0.43	0.35	0.34	0.30	0.49	0.55	-73.8%
Turkmenistan	..	..	..	..	12.12	7.90	8.12	10.12	11.19	12.42	12.18	0.5%
Ukraine	..	..	..	..	13.27	7.68	6.00	6.16	5.81	4.16	4.39	-66.9%
Uzbekistan	..	..	..	..	5.60	4.15	4.62	4.10	3.42	2.83	2.68	-52.2%
Former Soviet Union	7.98	9.82	11.12	11.15	..	..	..	..	..	..	..	..
Former Yugoslavia	3.09	3.54	3.87	5.28	..	..	..	..	..	..	..	..
Non-OECD Europe and Eurasia	7.41	9.05	10.28	10.37	11.50	7.67	7.00	7.36	7.54	7.00	6.94	-39.7%
Algeria	0.58	0.81	1.43	1.86	1.98	1.92	1.97	2.33	2.65	3.27	3.14	59.1%
Angola	0.23	0.26	0.30	0.27	0.32	0.27	0.28	0.31	0.65	0.71	0.68	110.9%
Benin	0.10	0.14	0.11	0.11	0.05	0.04	0.21	0.34	0.50	0.50	0.52	907.7%
Botswana	..	..	..	1.26	2.04	2.03	2.33	2.31	1.62	3.20	3.09	51.7%
Cameroon	0.11	0.14	0.19	0.24	0.23	0.18	0.18	0.17	0.25	0.26	0.26	15.5%
Congo	0.41	0.38	0.38	0.36	0.26	0.19	0.15	0.23	0.42	0.54	0.52	97.3%
Côte d'Ivoire	0.44	0.46	0.41	0.30	0.22	0.22	0.38	0.32	0.31	0.42	0.44	96.8%
Dem. Rep. of the Congo	0.13	0.11	0.12	0.11	0.09	0.03	0.02	0.02	0.03	0.04	0.03	-70.9%
Egypt	0.56	0.65	0.92	1.28	1.36	1.28	1.43	1.88	2.10	2.13	2.14	57.8%
Eritrea	..	..	..	..	..	0.25	0.18	0.15	0.11	0.12	0.12	..
Ethiopia	0.05	0.04	0.04	0.03	0.05	0.04	0.05	0.06	0.07	0.10	0.11	137.8%
Gabon	0.79	1.17	1.77	2.03	0.96	1.21	1.19	1.24	1.62	1.68	1.69	77.1%
Ghana	0.22	0.24	0.20	0.17	0.17	0.19	0.26	0.30	0.43	0.51	0.45	160.3%
Kenya	0.28	0.26	0.27	0.23	0.24	0.21	0.25	0.21	0.27	0.30	0.32	37.3%
Libya	1.67	3.28	5.46	5.48	5.83	6.66	6.86	7.42	7.79	6.73	6.88	18.1%
Mauritius	0.31	0.47	0.59	0.60	1.10	1.38	2.05	2.41	2.93	3.14	3.20	190.7%
Morocco	0.40	0.54	0.68	0.72	0.79	0.96	1.02	1.29	1.43	1.59	1.57	98.5%
Mozambique	0.31	0.23	0.20	0.12	0.08	0.07	0.07	0.07	0.10	0.18	0.25	206.1%
Namibia	..	..	..	..	..	1.08	1.00	1.23	1.41	1.57	1.64	..
Niger	..	..	..	..	..	..	0.06	0.05	0.08	0.10	0.09	..
Nigeria	0.10	0.17	0.35	0.38	0.30	0.30	0.36	0.41	0.35	0.46	0.46	56.6%
Senegal	0.28	0.33	0.37	0.33	0.28	0.28	0.36	0.41	0.42	0.50	0.53	87.6%
South Africa	6.80	7.90	7.17	6.76	6.63	6.27	6.25	7.82	7.98	7.46	7.41	11.8%
South Sudan	..	..	..	..	..	..	..	..	..	0.17	0.14	..
Sudan	0.22	0.20	0.19	0.18	0.20	0.15	0.16	0.25	0.34	0.40	0.48	133.8%
United Rep. of Tanzania	0.10	0.09	0.08	0.07	0.07	0.08	0.08	0.13	0.13	0.22	0.19	189.4%
Togo	0.16	0.13	0.14	0.09	0.15	0.14	0.19	0.17	0.32	0.25	0.26	69.1%
Tunisia	0.72	0.86	1.24	1.32	1.48	1.54	1.82	1.93	2.19	2.27	2.21	49.0%
Zambia	0.78	0.87	0.56	0.39	0.32	0.22	0.16	0.18	0.12	0.21	0.22	-31.0%
Zimbabwe	1.35	1.17	1.11	1.12	1.60	1.33	1.09	0.79	0.66	0.75	0.64	-59.9%
Other Africa	0.12	0.13	0.15	0.11	0.11	0.11	0.12	0.12	0.14	0.15	0.15	33.9%
Africa	0.67	0.78	0.83	0.85	0.84	0.80	0.81	0.93	0.95	0.96	0.95	12.6%

1. Please refer to the chapter Geographical coverage.

CO₂ emissions / populationtonnes CO₂ / capita

	1971	1975	1980	1985	1990	1995	2000	2005	2010	2015	2016	% change 90-16
Bangladesh	0.04	0.06	0.08	0.08	0.11	0.14	0.16	0.22	0.33	0.44	0.45	316.7%
Brunei Darussalam	2.93	8.69	13.60	13.09	12.59	15.16	13.29	13.21	17.64	14.30	14.94	18.7%
Cambodia	..	..	..	..	..	0.14	0.16	0.20	0.32	0.52	0.59	..
DPR of Korea	4.67	4.83	6.19	6.86	5.76	3.50	3.05	3.15	2.00	0.89	1.00	-82.6%
India	0.32	0.35	0.38	0.48	0.61	0.73	0.84	0.94	1.28	1.55	1.57	157.9%
Indonesia	0.21	0.29	0.46	0.51	0.74	1.04	1.21	1.41	1.49	1.76	1.74	135.4%
Malaysia	1.16	1.33	1.72	2.11	2.75	3.88	4.96	6.07	6.75	7.18	6.93	152.0%
Mongolia	..	..	..	6.12	5.88	4.45	3.74	4.35	5.21	5.74	5.93	0.9%
Myanmar	0.17	0.13	0.15	0.15	0.10	0.16	0.20	0.22	0.16	0.36	0.40	315.6%
Nepal	0.02	0.02	0.04	0.03	0.05	0.08	0.13	0.12	0.15	0.20	0.29	510.4%
Pakistan	0.27	0.30	0.31	0.40	0.52	0.65	0.68	0.75	0.76	0.80	0.79	52.7%
Philippines	0.65	0.71	0.69	0.54	0.61	0.82	0.87	0.83	0.82	1.02	1.11	80.9%
Singapore	2.87	3.73	5.24	6.07	9.51	10.66	10.46	8.88	8.72	7.98	8.07	-15.1%
Sri Lanka	0.22	0.20	0.25	0.22	0.22	0.30	0.56	0.69	0.62	0.93	0.99	358.6%
Chinese Taipei	2.00	2.53	4.01	3.59	5.49	7.28	9.77	11.19	11.05	10.71	10.98	100.0%
Thailand	0.43	0.50	0.71	0.81	1.43	2.35	2.42	3.06	3.32	3.61	3.55	148.5%
Viet Nam	0.37	0.35	0.28	0.30	0.26	0.38	0.57	0.96	1.45	1.84	2.02	667.3%
Other non-OECD Asia	0.38	0.42	0.54	0.34	0.31	0.30	0.32	0.37	0.47	0.68	0.93	203.6%
Asia (excl. China)	0.40	0.44	0.53	0.60	0.74	0.90	1.02	1.16	1.38	1.59	1.61	116.9%
People's Rep. of China	0.93	1.12	1.39	1.55	1.84	2.41	2.46	4.15	5.83	6.64	6.57	257.0%
Hong Kong, China	2.28	2.44	2.89	4.09	5.84	5.93	6.05	6.07	5.98	6.01	6.09	4.3%
China	0.93	1.13	1.40	1.56	1.86	2.43	2.47	4.16	5.83	6.64	6.57	253.1%
Argentina	3.39	3.27	3.39	2.89	3.04	3.35	3.76	3.82	4.22	4.39	4.35	43.1%
Bolivia	0.47	0.64	0.75	0.69	0.75	0.91	0.85	0.99	1.38	1.70	1.86	146.7%
Brazil	0.90	1.20	1.39	1.15	1.23	1.40	1.67	1.66	1.88	2.19	2.01	62.6%
Colombia	1.18	1.14	1.26	1.27	1.34	1.45	1.34	1.24	1.31	1.62	1.77	32.1%
Costa Rica	0.67	0.83	0.90	0.71	0.84	1.27	1.15	1.28	1.46	1.44	1.54	83.1%
Cuba	2.35	2.56	3.10	3.19	3.22	2.06	2.45	2.22	2.60	2.34	2.03	-37.1%
Curaçao ¹	90.15	60.33	50.15	24.58	14.10	13.23	26.77	27.16	19.11	29.59	25.92	83.9%
Dominican Republic	0.75	1.01	1.09	0.96	1.03	1.42	2.06	1.88	1.92	2.04	2.10	103.8%
Ecuador	0.56	0.85	1.31	1.29	1.30	1.46	1.44	1.74	2.15	2.28	2.14	63.9%
El Salvador	0.35	0.46	0.35	0.33	0.40	0.82	0.88	1.04	0.95	1.02	1.07	165.6%
Guatemala	0.39	0.47	0.58	0.39	0.35	0.56	0.74	0.81	0.70	0.93	0.98	183.2%
Haiti	0.08	0.08	0.11	0.13	0.13	0.12	0.16	0.21	0.21	0.30	0.30	127.3%
Honduras	0.40	0.42	0.46	0.39	0.44	0.63	0.69	0.97	0.92	1.03	1.00	128.2%
Jamaica	2.91	3.67	3.03	2.00	2.99	3.32	3.69	3.75	2.46	2.44	2.51	-16.1%
Nicaragua	0.60	0.66	0.56	0.49	0.44	0.55	0.71	0.75	0.75	0.84	0.86	94.1%
Panama	1.59	1.78	1.47	1.20	1.04	1.49	1.61	2.03	2.43	2.69	2.52	142.8%
Paraguay	0.23	0.25	0.42	0.39	0.46	0.73	0.62	0.60	0.75	0.86	0.95	108.1%
Peru	1.12	1.20	1.18	0.92	0.88	0.97	1.02	1.04	1.40	1.56	1.62	84.3%
Suriname	..	..	..	..	..	..	3.08	3.31	3.22	3.74	3.42	..
Trinidad and Tobago	5.62	4.53	5.87	5.68	6.47	6.51	7.97	13.53	16.83	15.92	15.47	139.2%
Uruguay	1.81	1.89	1.83	1.00	1.16	1.36	1.53	1.55	1.77	1.86	1.84	58.8%
Venezuela	3.85	4.20	5.43	4.86	4.71	4.78	4.75	5.14	5.91	4.51	4.03	-14.4%
Other non-OECD Americas	3.13	4.03	3.66	3.17	4.09	4.13	4.77	4.73	5.22	5.83	5.87	43.6%
Non-OECD Americas	1.48	1.63	1.81	1.55	1.61	1.74	1.93	1.98	2.22	2.35	2.25	39.3%
Bahrain	13.15	19.59	20.11	21.72	21.53	23.86	23.82	23.13	20.59	21.92	20.80	-3.4%
Islamic Republic of Iran	1.33	2.08	2.29	3.06	3.05	4.04	4.72	5.93	6.69	6.97	7.02	130.4%
Iraq	1.01	1.33	1.92	2.44	3.00	4.71	2.99	2.71	3.38	3.61	3.76	25.4%
Jordan	0.75	1.04	1.82	2.58	2.58	2.67	2.79	3.14	2.62	2.60	2.52	-2.0%
Kuwait	17.53	14.74	19.27	21.13	13.24	20.08	22.58	28.44	25.69	23.01	22.25	68.1%
Lebanon	1.95	2.22	2.55	2.47	2.04	4.22	4.33	3.63	4.20	3.89	3.86	89.3%
Oman	0.34	0.82	1.95	3.76	5.61	6.67	9.00	10.03	13.93	15.15	14.27	154.4%
Qatar	18.83	30.05	31.17	28.80	26.12	32.81	35.91	38.40	31.17	31.28	30.77	17.8%
Saudi Arabia	2.08	3.03	10.21	8.93	9.26	10.23	11.30	12.47	15.28	16.84	16.34	76.5%
Syrian Arab Republic	0.83	1.10	1.38	1.84	2.19	2.17	2.26	2.92	2.69	1.39	1.42	-35.3%
United Arab Emirates	8.83	8.88	18.45	25.62	27.90	28.44	25.31	24.27	18.69	20.38	20.69	-25.8%
Yemen	0.19	0.26	0.43	0.49	0.52	0.62	0.75	0.92	0.95	0.42	0.33	-36.0%
Middle East	1.49	2.10	3.43	4.06	4.20	5.16	5.44	6.34	7.24	7.64	7.58	80.5%

1. Please refer to the chapter Geographical coverage.

Per capita emissions by sector in 2016 ¹kilogrammes CO₂ / capita

	Total CO ₂ emissions from fuel combustion	Electricity and heat production	Other energy ind. own use ²	Manufacturing industries and construction	Transport	of which: road	Residential	Commercial and public services
World ³	4 350	1 805	214	822	1 059	788	254	113
<i>Annex I Parties</i>	9 286	3 740	533	1 076	2 652	2 281	740	403
<i>Annex II Parties</i>	10 214	3 836	630	1 133	3 205	2 800	761	500
<i>North America</i>	14 942	5 547	1 012	1 384	5 237	4 406	885	699
<i>Europe</i>	6 231	1 961	345	780	1 900	1 799	783	345
<i>Asia Oceania</i>	10 051	4 942	513	1 509	2 037	1 795	417	456
<i>Annex I EIT</i>	7 707	3 987	319	1 009	1 369	1 025	764	135
<i>Non-Annex I Parties</i>	3 082	1 388	146	768	512	466	149	50
<i>Annex B Kyoto Parties</i>	6 657	2 480	432	868	1 746	1 636	709	290
Non-OECD Total	3 171	1 451	142	779	512	451	168	50
OECD Total	9 024	3 500	562	1 030	2 711	2 399	665	415
Canada	14 912	2 791	3 095	1 766	4 753	3 795	1 006	1 017
Chile	4 666	1 921	111	823	1 443	1 301	206	118
Mexico	3 643	1 217	387	507	1 275	1 235	140	39
United States	14 945	5 856	779	1 341	5 291	4 475	871	664
OECD Americas	11 804	4 356	826	1 149	4 130	3 518	678	517
Australia	16 003	7 935	1 676	1 579	3 919	3 283	378	221
Israel ⁴	7 461	4 439	257	499	2 056	2 047	45	44
Japan	9 035	4 512	294	1 499	1 635	1 469	436	511
Korea	11 497	6 054	905	1 425	1 977	1 870	655	347
New Zealand	6 452	955	362	1 394	3 097	2 822	119	205
OECD Asia Oceania	10 292	5 186	596	1 449	2 024	1 823	459	414
Austria	7 195	1 545	673	1 320	2 693	2 603	700	182
Belgium	8 106	1 433	528	1 696	2 303	2 230	1 387	603
Czech Republic	9 598	5 220	382	1 103	1 704	1 666	778	285
Denmark	5 840	2 064	349	607	2 058	1 896	377	112
Estonia	12 439	9 442	115	484	1 812	1 730	132	207
Finland	8 284	3 339	598	1 360	2 248	2 132	203	156
France	4 381	551	215	562	1 824	1 760	686	356
Germany	8 884	3 908	293	1 083	1 955	1 892	1 082	559
Greece	5 853	2 649	418	601	1 592	1 364	434	80
Hungary	4 476	1 212	158	647	1 243	1 219	740	318
Iceland	6 164	19	-	1 665	2 763	2 614	18	-
Ireland	7 873	2 659	82	844	2 540	2 458	1 249	381
Italy	5 372	1 785	164	572	1 678	1 583	771	279
Latvia	3 471	958	-	325	1 574	1 479	228	180
Luxembourg	14 512	467	-	1 671	9 543	9 521	1 775	959
Netherlands	9 226	3 568	603	1 406	1 769	1 706	986	474
Norway	6 784	347	2 257	1 152	2 543	1 782	184	160
Poland	7 628	3 905	202	732	1 386	1 355	934	220
Portugal	4 588	1 755	377	517	1 561	1 485	169	98
Slovak Republic	5 563	1 211	949	1 344	1 243	1 164	488	280
Slovenia	6 579	2 377	-	797	2 735	2 718	340	204
Spain	5 137	1 436	427	635	1 911	1 731	355	234
Sweden	3 825	715	277	641	2 016	1 947	15	132
Switzerland	4 532	325	45	625	1 916	1 884	1 045	508
Turkey	4 329	1 662	211	653	1 010	933	403	288
United Kingdom	5 653	1 514	393	555	1 835	1 743	1 002	288
OECD Europe ⁴	6 095	2 107	317	766	1 723	1 633	732	325
<i>IEA/Accession/Association</i>	5 198	2 228	250	1 068	1 101	971	295	154
<i>European Union - 28</i>	6 244	2 197	311	766	1 779	1 696	752	314
<i>G20</i>	5 519	2 431	263	1 107	1 134	986	324	156
<i>Africa</i>	945	386	68	115	286	274	59	10
<i>Americas</i>	7 076	2 466	514	779	2 515	2 178	408	273
<i>Asia</i>	3 934	1 852	161	1 017	551	492	188	81
<i>Europe</i>	6 779	2 808	326	863	1 653	1 457	757	253
<i>Oceania</i>	10 921	5 138	1 068	1 212	2 862	2 420	255	160

1. This table shows per capita emissions for the same sectors which are present throughout this publication. In particular, the emissions from electricity and heat production are shown separately and not reallocated. 2. Includes emissions from own use in petroleum refining, the manufacture of solid fuels, coal mining, oil and gas extraction and other energy-producing industries. 3. World includes international bunkers in the transport sector. 4. Please refer to the chapter *Geographical Coverage*.

Per capita emissions by sector in 2016

kilogrammes CO₂ / capita

	Total CO ₂ emissions from fuel combustion	Electricity and heat production	Other energy ind. own use	Manufacturing industries and construction	Transport	of which: road	Residential	Commercial and public services
Non-OECD Total	3 171	1 451	142	779	512	451	168	50
Albania	1 278	-	42	212	797	758	86	50
Armenia	1 665	405	-	149	540	540	387	98
Azerbaijan	3 218	1 273	195	286	671	588	650	39
Belarus	5 585	2 901	343	477	1 137	961	476	37
Bosnia and Herzegovina	6 244	4 048	200	582	1 026	1 026	185	192
Bulgaria	5 684	3 492	170	521	1 278	1 217	113	43
Croatia	3 802	851	306	522	1 455	1 402	364	146
Cyprus ¹	7 393	3 790	-	705	2 256	2 256	413	108
FYR of Macedonia	3 320	1 717	3	477	980	977	18	101
Georgia	2 369	288	1	416	1 105	1 094	430	111
Gibraltar	18 991	5 646	-	-	13 345	13 345	-	-
Kazakhstan	12 921	5 146	2 791	3 114	851	794	552	358
Kosovo	5 001	3 707	-	343	656	652	40	226
Kyrgyzstan	1 527	317	1	146	545	537	358	96
Lithuania	3 746	478	550	396	1 894	1 810	238	111
Malta	3 099	1 276	-	64	1 324	1 217	114	263
Republic of Moldova	2 172	1 003	-	223	576	559	226	79
Montenegro	3 392	1 950	-	272	1 060	1 045	35	55
Romania	3 445	1 356	161	592	837	809	317	105
Russian Federation	9 967	5 382	439	1 301	1 664	1 010	961	122
Serbia	6 444	4 463	96	640	846	837	206	124
Tajikistan	546	61	-	9	147	147	-	-
Turkmenistan	12 179	3 662	920	415	2 078	1 390	82	2 975
Ukraine	4 393	2 254	85	836	542	459	516	51
Uzbekistan	2 679	1 146	79	347	178	99	699	138
Non-OECD Europe and Eurasia¹	6 937	3 488	405	975	1 119	798	652	163
Algeria	3 143	891	285	268	1 110	1 055	510	-
Angola	679	138	13	86	290	269	56	94
Benin	524	22	-	57	438	438	6	1
Botswana	3 091	1 610	-	318	1 097	1 080	16	29
Cameroon	261	88	3	10	136	135	20	-
Congo	517	91	-	14	395	320	16	-
Côte d'Ivoire	435	160	7	66	153	135	20	14
Dem. Rep. of the Congo	25	-	-	1	24	20	-	-
Egypt	2 140	933	116	299	585	556	175	-
Eritrea	116	66	-	3	36	36	9	1
Ethiopia	107	-	-	36	52	49	8	2
Gabon	1 693	482	23	595	411	411	92	63
Ghana	453	92	4	59	258	239	28	3
Kenya	324	38	2	72	183	179	25	-
Libya	6 878	2 980	80	265	3 369	3 368	185	-
Mauritius	3 195	1 899	-	258	877	830	118	38
Morocco	1 568	613	-	202	484	481	184	11
Mozambique	251	44	1	25	134	127	3	4
Namibia	1 636	34	-	137	896	855	3	3
Niger	94	24	-	10	57	57	2	1
Nigeria	462	69	71	36	273	271	9	-
Senegal	529	193	4	113	192	183	25	1
South Africa	7 412	4 217	788	900	991	920	258	121
South Sudan	144	37	18	2	80	76	1	-
Sudan	477	153	4	40	239	237	14	10
United Rep. of Tanzania	191	32	-	24	125	125	8	-
Togo	257	3	-	23	201	201	30	-
Tunisia	2 207	755	46	451	621	568	172	58
Zambia	220	37	2	92	71	68	1	5
Zimbabwe	640	379	5	66	133	126	15	-
Other Africa	146	32	4	27	69	65	7	1
Africa	945	386	68	115	286	274	59	10

1. Please refer to the chapter *Geographical Coverage*.

Per capita emissions by sector in 2016

kilogrammes CO₂ / capita

	Total CO ₂ emissions from fuel combustion	Electricity and heat production	Other energy ind. own use	Manufacturing industries and construction	Transport	of which: road	Residential	Commercial and public services
Bangladesh	450	222	1	93	60	46	52	3
Brunei Darussalam	14 942	6 111	4 603	777	3 162	3 162	205	-
Cambodia	589	190	-	42	318	263	9	21
DPR of Korea	1 002	162	2	597	57	57	5	-
India	1 568	810	29	403	200	186	64	18
Indonesia	1 742	694	97	323	515	452	78	10
Malaysia	6 931	3 290	510	950	2 012	1 954	51	81
Mongolia	5 934	3 870	3	473	577	423	540	-
Myanmar	399	119	20	77	84	59	1	18
Nepal	293	-	-	96	134	134	23	17
Pakistan	794	231	8	216	239	233	78	19
Philippines	1 111	533	9	162	323	280	29	48
Singapore	8 073	3 627	965	2 217	1 151	1 131	36	77
Sri Lanka	986	409	2	76	442	425	30	7
Chinese Taipei	10 982	6 521	623	1 816	1 607	1 570	187	160
Thailand	3 551	1 326	272	719	1 004	952	64	31
Viet Nam	2 018	798	-	673	398	385	84	49
Other non-OECD Asia	929	504	-	129	237	200	9	1
Asia (excl. China)	1 614	767	50	373	301	278	62	21
People's Rep. of China	6 569	3 161	207	2 062	612	506	271	110
Hong Kong, China	6 088	3 826	-	992	1 051	1 049	108	111
China	6 567	3 165	206	2 056	614	509	270	110
Argentina	4 347	1 258	424	684	1 060	939	570	86
Bolivia	1 855	418	100	197	749	714	140	12
Brazil	2 007	335	127	413	956	872	87	11
Colombia	1 765	348	225	302	647	645	76	20
Costa Rica	1 540	27	6	228	1 169	1 166	38	21
Cuba	2 028	968	47	569	131	127	51	2
Curaçao ¹	25 923	2 820	12 848	2 489	6 852	6 852	914	-
Dominican Republic	2 101	1 091	13	285	552	427	124	21
Ecuador	2 137	466	93	193	1 018	968	145	68
El Salvador	1 065	248	-	156	552	552	96	13
Guatemala	980	306	8	123	485	484	57	2
Haiti	300	88	-	56	131	131	24	-
Honduras	1 002	371	-	142	446	425	29	-
Jamaica	2 509	964	-	825	616	615	39	54
Nicaragua	862	258	6	108	384	345	25	74
Panama	2 518	651	-	511	1 157	1 155	146	40
Paraguay	953	-	-	24	897	893	31	-
Peru	1 616	431	124	244	702	697	81	23
Suriname	3 416	1 542	33	109	1 087	684	64	39
Trinidad and Tobago	15 465	4 223	5 090	3 144	2 724	2 470	261	24
Uruguay	1 837	101	140	247	1 048	1 041	137	27
Venezuela	4 034	1 074	719	802	1 267	1 266	128	45
Other non-OECD Americas	5 870	3 387	1	240	1 715	1 600	165	139
Non-OECD Americas	2 245	534	195	400	865	810	131	25
Bahrain	20 799	14 097	2 489	1 487	2 546	2 474	180	-
Islamic Republic of Iran	7 018	1 913	517	1 138	1 627	1 430	1 434	242
Iraq	3 761	2 272	328	238	681	681	242	-
Jordan	2 524	1 036	65	285	877	874	161	42
Kuwait	22 253	10 735	3 438	4 354	3 505	3 505	220	-
Lebanon	3 862	2 198	-	186	943	943	535	-
Oman	14 268	3 642	1 741	5 368	2 788	2 788	127	-
Qatar	30 767	8 008	12 185	5 290	5 128	5 128	156	-
Saudi Arabia	16 335	7 623	888	3 433	4 240	4 152	151	-
Syrian Arab Republic	1 416	623	33	191	350	345	127	30
United Arab Emirates	20 691	9 238	281	7 353	3 736	3 625	83	-
Yemen	334	116	5	37	100	100	65	8
Middle East	7 583	3 038	613	1 479	1 691	1 605	604	88

1. Please refer to the chapter *Geographical Coverage*.

Share of electricity output from non fossil sources ¹

[%]

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	% change 90-16
World	36.6	37.6	35.3	33.3	32.5	31.7	31.9	32.4	33.1	33.5	34.4	-6.0%
<i>Annex I Parties</i>	37.9	40.7	39.1	38.3	39.7	39.2	39.1	40.6	41.5	42.1	43.0	13.5%
<i>Annex II Parties</i>	41.0	42.4	40.2	39.1	40.9	40.5	40.3	41.8	42.9	43.3	44.3	8.0%
<i>North America</i>	36.8	37.3	33.9	33.6	35.2	37.2	37.1	38.3	38.6	38.9	40.6	10.3%
<i>Europe</i>	50.8	52.7	52.2	50.3	53.4	54.5	56.8	59.5	62.2	61.9	61.5	21.1%
<i>Asia Oceania</i>	34.5	38.3	37.2	34.1	33.4	21.8	15.0	15.6	16.7	18.5	19.8	-42.6%
<i>Annex I EIT</i>	25.7	31.5	33.8	35.1	34.9	34.0	34.6	36.0	37.1	37.4	37.5	45.9%
<i>Non-Annex I Parties</i>	32.5	30.3	27.6	25.7	24.5	23.9	24.7	24.8	25.7	26.1	27.2	-16.3%
<i>Annex B Kyoto Parties</i>	41.7	45.6	46.0	44.9	47.1	47.6	49.6	51.9	54.3	54.2	53.8	29.0%
Non-OECD Total	30.0	30.9	29.1	27.2	25.9	25.1	26.0	26.2	26.9	27.3	28.4	-5.3%
OECD Total	40.1	41.3	38.9	37.8	39.0	38.6	38.3	39.6	40.7	41.3	42.0	4.7%
Canada	77.5	78.5	72.6	74.9	76.9	77.8	78.9	79.9	80.0	78.8	80.2	3.5%
Chile	53.8	72.4	48.5	53.9	40.4	39.6	36.4	35.9	43.3	43.6	43.3	-19.5%
Mexico	27.2	29.2	23.8	19.5	18.7	18.2	16.6	17.3	20.8	19.0	18.6	-31.6%
United States	30.6	30.9	28.0	27.6	29.5	31.3	30.9	31.9	32.3	32.7	34.5	12.7%
OECD Americas	36.6	37.3	33.5	33.1	34.4	36.2	35.9	37.1	37.7	37.8	39.3	7.4%
Australia	9.7	9.6	8.4	8.8	8.6	10.4	10.5	13.1	14.6	13.3	14.5	49.5%
Israel ²	-	0.1	0.1	0.1	0.3	0.6	0.8	0.9	1.5	1.9	2.5	x
Japan	37.3	41.6	41.6	38.2	37.4	22.2	13.6	13.9	14.6	17.2	18.5	-50.4%
Korea	56.2	38.7	39.2	38.9	31.2	31.3	29.7	27.6	30.4	32.2	32.1	-42.9%
New Zealand	80.2	84.0	71.7	64.2	73.1	76.0	71.8	74.2	79.2	80.1	84.1	4.9%
OECD Asia Oceania	35.9	37.5	36.6	34.2	31.8	23.7	18.6	18.5	20.1	21.8	22.7	-36.8%
Austria	66.2	70.5	72.6	63.4	66.2	65.6	74.5	78.1	81.1	76.5	77.8	17.5%
Belgium	61.6	57.2	59.4	58.3	58.3	63.7	62.5	66.6	64.8	59.7	69.0	12.0%
Czech Republic	22.1	24.2	21.8	34.0	39.8	41.0	44.4	46.7	46.5	44.0	40.9	85.1%
Denmark	3.2	5.1	15.6	27.1	32.0	40.3	48.3	46.0	55.9	65.5	60.5	+
Estonia	-	0.1	0.2	1.1	8.1	9.1	12.3	9.2	11.2	14.4	12.4	x
Finland	64.8	60.5	65.8	66.6	58.6	64.8	73.7	69.5	73.6	78.7	78.4	21.0%
France	88.7	92.2	90.5	88.9	89.8	90.6	91.0	91.7	94.7	93.3	90.9	2.5%
Germany	31.3	33.6	35.8	37.2	39.5	38.5	39.3	39.7	42.1	43.8	42.7	36.4%
Greece	5.1	8.6	7.8	10.8	18.3	13.8	16.7	25.1	24.2	28.7	27.4	437.3%
Hungary	49.0	41.9	41.0	43.9	50.3	51.1	53.2	60.0	64.1	63.0	60.7	23.9%
Iceland	99.9	99.8	99.9	99.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.1%
Ireland	4.9	4.1	5.0	7.3	13.2	20.0	19.4	22.0	24.8	28.0	24.9	408.2%
Italy	16.4	17.6	19.1	16.7	26.0	27.9	31.3	39.2	43.6	38.9	37.8	130.5%
Latvia	67.6	73.8	68.3	69.6	54.9	50.5	66.6	56.9	54.5	50.2	54.2	-19.8%
Luxembourg	13.3	22.0	41.0	6.3	8.3	9.3	11.2	20.0	20.9	32.3	58.2	337.6%
Netherlands	6.2	7.0	8.0	11.7	12.8	14.6	16.0	14.9	15.4	16.3	16.4	164.5%
Norway	99.9	99.8	99.8	99.6	95.8	96.6	98.0	97.9	97.9	97.9	98.0	-1.9%
Poland	1.1	1.4	1.6	2.7	7.0	8.1	10.5	10.5	12.6	13.9	13.8	+
Portugal	34.7	28.3	29.7	17.9	52.8	46.5	42.5	58.3	60.8	47.5	54.6	57.3%
Slovak Republic	54.6	61.7	68.5	71.5	74.8	72.4	74.3	77.7	80.5	79.9	80.3	47.1%
Slovenia	60.8	62.2	63.6	62.6	64.0	63.4	63.4	65.8	75.6	67.5	66.4	9.2%
Spain	53.1	48.2	43.8	36.2	53.6	49.9	50.6	59.7	60.9	55.6	60.2	13.4%
Sweden	97.7	94.7	96.7	97.0	94.3	96.2	97.5	97.5	98.1	98.1	97.7	x
Switzerland	98.0	97.4	97.0	96.2	96.6	96.6	96.8	97.0	97.3	97.1	96.5	-1.5%
Turkey	40.4	41.6	25.0	24.6	26.4	25.4	27.3	28.9	21.0	32.1	33.1	-18.1%
United Kingdom	22.5	28.8	25.4	24.9	23.3	28.5	30.9	34.8	38.3	45.7	46.1	104.9%
OECD Europe	47.1	49.2	48.2	46.7	49.5	50.2	52.4	54.8	56.6	57.1	56.6	20.2%
<i>IEA/Accession/Association</i>	39.2	39.2	36.3	34.1	33.8	32.7	33.0	33.5	34.5	35.2	36.2	-7.7%
<i>European Union - 28</i>	42.9	45.7	45.4	44.6	48.0	48.6	50.7	53.7	56.4	56.1	55.6	29.6%
<i>G20</i>	36.1	37.1	34.8	33.0	32.8	31.7	31.9	32.6	33.5	34.1	35.1	-2.8%
<i>Africa</i>	20.7	20.0	20.3	18.5	19.1	18.9	18.2	19.1	19.9	19.4	19.2	-7.2%
<i>Americas</i>	41.0	42.1	38.9	38.7	40.3	42.3	41.8	42.4	42.6	42.4	44.3	8.0%
<i>Asia</i>	28.3	26.7	23.8	22.1	21.2	18.8	19.3	19.8	20.9	22.1	23.4	-17.3%
<i>Europe</i>	39.3	44.7	45.6	44.8	46.6	46.6	48.2	50.5	52.5	52.5	52.3	33.1%
<i>Oceania</i>	22.2	22.8	18.7	17.8	18.5	20.3	19.9	22.3	24.3	23.4	24.6	10.8%

1. This indicator was calculated as the ratio between electricity output from non fossil sources and the total electricity output. Both main activity producers and autoproducers have been included in the calculation. 2. Please refer to the chapter Geographical coverage.

Share of electricity output from non fossil sources

[%]

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	% change 90-16
Non-OECD Total	30.0	30.9	29.1	27.2	25.9	25.1	26.0	26.2	26.9	27.3	28.4	-5.3%
Albania	86.4	94.0	96.1	98.7	100.0	98.6	100.0	100.0	100.0	100.0	100.0	15.7%
Armenia	15.0	40.0	54.8	71.1	77.8	67.8	57.7	58.8	57.6	64.1	64.7	331.3%
Azerbaijan	7.2	9.1	8.2	13.2	18.4	13.2	7.9	6.7	5.6	7.0	8.4	16.7%
Belarus	0.1	0.1	0.1	0.1	0.4	0.4	0.6	0.8	0.7	0.8	1.2	+
Bosnia and Herzegovina	20.9	82.8	48.8	47.6	46.9	28.7	29.9	41.5	36.7	35.5	31.9	52.6%
Bulgaria	39.3	46.8	51.3	52.3	45.7	40.5	45.4	49.0	49.6	49.6	51.3	30.5%
Croatia	45.6	61.4	57.3	54.1	62.8	47.0	49.7	66.5	74.0	66.8	66.3	45.4%
Cyprus ¹	-	-	-	-	1.4	3.6	5.4	7.6	7.3	8.8	8.7	x
FYR of Macedonia	8.5	13.1	17.2	21.5	33.5	21.2	16.7	26.1	24.0	35.9	36.7	331.8%
Georgia	55.2	63.8	78.9	85.8	92.5	77.4	74.5	82.2	80.4	78.0	80.7	46.2%
Gibraltar	-	-	-	-	-	-	-	-	-	-	-	-
Kazakhstan	8.4	12.5	14.7	11.6	9.7	9.1	8.2	7.5	7.9	8.9	11.2	33.3%
Kosovo	100.0	100.0	1.8	2.5	3.0	1.8	1.6	2.2	2.8	2.3	4.1	-95.9%
Kyrgyzstan	63.5	77.8	85.9	85.9	91.8	93.3	93.5	93.5	91.3	85.2	86.7	36.5%
Lithuania	61.6	90.4	79.6	76.3	23.2	32.2	31.1	41.8	47.3	45.6	64.1	4.1%
Malta	-	-	-	-	-	0.5	1.1	1.6	3.3	7.7	15.5	x
Republic of Moldova	1.6	4.2	6.7	6.3	6.7	6.1	4.6	7.0	6.2	5.4	4.2	162.5%
Montenegro	100.0	100.0	100.0	65.2	68.4	45.3	51.9	63.5	55.2	49.7	58.7	-41.3%
Romania	17.7	28.5	39.7	43.4	52.7	45.3	44.9	54.3	59.5	57.4	59.2	234.5%
Russian Federation	26.3	32.0	33.6	33.9	32.6	32.2	32.2	33.5	33.6	34.2	35.1	33.5%
Serbia	23.1	35.4	35.1	33.0	31.8	22.8	25.7	26.1	33.0	26.9	28.1	21.6%
Tajikistan	90.9	98.5	98.4	99.3	99.8	99.8	99.6	99.7	99.0	99.1	96.5	6.2%
Turkmenistan	4.8	-	-	-	-	-	-	-	-	-	-	-100.0%
Ukraine	29.0	41.5	51.7	54.4	54.3	52.0	51.1	50.8	54.2	58.7	55.4	91.0%
Uzbekistan	11.8	13.0	12.5	17.5	21.0	19.5	21.4	21.3	21.4	20.7	20.3	72.0%
Former Soviet Union	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	-
Former Yugoslavia	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	-
Non-OECD Europe and Eurasia	25.9	33.2	36.0	36.6	35.5	33.8	33.6	35.0	35.5	35.8	36.4	40.5%
Algeria	0.8	1.0	0.2	1.6	0.4	1.0	1.1	0.6	0.4	0.3	0.5	-37.5%
Angola	86.2	93.7	63.1	79.6	68.0	70.9	60.8	58.0	53.2	53.2	56.1	-34.9%
Benin	-	-	2.4	0.9	0.9	-	-	-	-	5.6	5.6	x
Botswana	-	-	-	-	-	-	-	0.2	0.1	0.1	0.1	x
Cameroon	98.5	98.9	98.9	94.2	73.2	75.3	75.4	68.2	65.2	54.9	55.1	-44.1%
Congo	99.4	99.4	99.7	82.0	54.7	61.2	58.1	56.8	54.7	53.3	54.7	-45.0%
Côte d'Ivoire	66.7	60.5	36.7	27.2	28.3	30.1	26.4	21.9	23.9	16.7	16.6	-75.1%
Dem. Rep. of the Congo	99.6	99.7	99.9	99.9	98.9	98.9	99.9	99.9	99.9	99.8	99.8	0.2%
Egypt	23.5	21.9	17.7	12.1	10.0	9.3	8.9	8.8	8.9	8.5	8.1	-65.5%
Eritrea	100.0	-	0.5	0.3	0.6	0.6	0.6	0.5	0.5	0.5	0.5	-99.5%
Ethiopia	88.4	93.5	98.6	99.6	99.4	99.4	99.8	99.9	100.0	100.0	100.0	13.1%
Gabon	72.4	70.2	61.6	52.1	47.3	41.6	42.5	45.1	40.4	43.7	41.4	-42.8%
Ghana	100.0	99.7	91.5	82.9	68.8	67.5	67.1	64.0	64.7	50.9	42.9	-57.1%
Kenya	92.9	89.8	47.0	71.7	69.1	66.9	74.8	69.3	81.5	87.5	79.3	-14.6%
Libya	-	-	-	-	-	-	-	-	-	-	-	-
Mauritius	31.2	26.8	29.6	25.0	24.3	20.2	20.7	20.6	20.3	22.7	21.8	-30.1%
Morocco	12.7	5.1	6.1	6.1	17.4	10.8	8.6	19.4	16.8	18.5	18.8	48.0%
Mozambique	62.6	92.9	99.5	99.8	99.9	99.9	99.9	97.7	91.2	86.4	83.3	33.1%
Namibia	100.0	96.8	99.2	99.8	95.6	98.2	97.8	95.6	99.1	97.8	95.6	-4.4%
Niger	100.0	100.0	-	0.9	1.0	-	-	0.9	0.9	0.8	1.0	-99.0%
Nigeria	32.6	34.7	38.2	33.0	24.4	21.8	19.7	18.4	17.6	18.2	18.1	-44.5%
Senegal	4.7	4.1	10.0	18.2	13.6	14.0	13.3	12.2	10.8	10.7	10.7	127.7%
South Africa	5.7	6.4	6.9	5.3	5.7	6.1	5.3	6.2	6.9	7.4	9.1	59.6%
South Sudan	100.0	100.0	100.0	100.0	100.0	100.0	0.4	0.4	0.4	0.3	0.5	-99.5%
Sudan	63.2	52.1	46.0	33.0	82.7	76.5	70.1	80.9	78.3	64.5	55.8	-11.7%
United Rep. of Tanzania	95.1	80.0	86.4	50.0	51.7	39.8	32.2	29.5	42.3	33.6	34.5	-63.7%
Togo	60.1	82.5	57.1	40.2	54.2	86.7	84.7	81.7	86.2	75.3	90.1	49.9%
Tunisia	0.8	0.5	0.8	1.5	4.1	2.2	2.9	3.7	4.3	3.9	4.1	412.5%
Zambia	99.2	99.3	99.4	99.4	99.9	99.9	99.9	99.9	97.2	97.0	94.3	-4.9%
Zimbabwe	46.7	29.3	45.7	52.4	68.0	57.9	60.4	54.0	55.6	52.7	44.1	-5.6%
Other Africa	53.5	53.6	54.6	50.2	46.5	44.3	51.7	56.0	57.8	61.9	62.1	16.1%
Africa	20.7	20.0	20.3	18.5	19.1	18.9	18.2	19.1	19.9	19.4	19.2	-7.2%

1. Please refer to the chapter Geographical coverage.

Share of electricity output from non fossil sources

[%]

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	% change 90-16
Bangladesh	11.4	3.4	4.7	2.8	1.8	2.0	1.6	1.9	1.3	1.2	1.1	-90.4%
Brunei Darussalam	-	-	-	-	-	0.1	0.1	-	-	-	-	-
Cambodia	100.0	-	0.2	6.1	5.5	7.1	37.7	57.9	61.1	46.4	47.6	-52.4%
DPR of Korea	56.3	61.7	52.6	57.3	61.9	68.7	70.2	75.8	72.6	72.8	75.6	34.3%
India	26.6	19.1	16.6	19.0	18.8	20.2	18.8	20.3	19.1	18.3	18.8	-29.3%
Indonesia	20.9	16.5	16.0	13.6	15.9	12.0	11.2	12.3	11.5	10.7	12.8	-38.8%
Malaysia	17.3	13.7	10.1	6.3	6.0	6.7	7.4	8.6	9.7	10.0	13.5	-22.0%
Mongolia	-	-	0.1	0.1	1.0	1.3	1.2	2.5	3.8	4.0	3.9	x
Myanmar	48.1	40.0	37.0	49.8	67.7	76.2	72.4	72.0	62.4	58.9	54.5	13.3%
Nepal	99.9	96.9	98.4	99.4	99.9	99.9	99.5	99.7	100.0	100.0	100.0	0.1%
Pakistan	45.7	41.6	28.2	35.6	37.3	35.5	35.8	35.9	36.5	36.6	37.8	-17.3%
Philippines	45.4	36.8	42.9	32.4	26.3	28.7	28.4	26.4	25.6	25.4	24.2	-46.7%
Singapore	0.5	1.1	0.8	1.3	1.3	1.3	1.4	1.5	1.7	1.8	1.9	280.0%
Sri Lanka	99.8	92.7	45.8	37.2	53.1	40.8	29.2	59.9	39.2	48.5	32.6	-67.3%
Chinese Taipei	44.4	31.1	24.4	20.5	20.1	19.9	20.0	20.4	19.8	17.8	16.4	-63.1%
Thailand	11.3	8.7	6.8	5.5	5.6	8.0	8.3	8.1	8.4	8.4	15.2	34.5%
Viet Nam	61.8	72.2	54.8	31.7	29.1	39.5	45.0	43.2	43.4	36.0	39.0	-36.9%
Other non-OECD Asia	54.8	54.2	59.6	53.0	64.5	64.7	65.9	65.2	62.0	69.2	59.9	9.3%
Asia (excl. China)	31.0	23.6	19.7	19.4	19.1	20.1	19.7	20.7	19.9	19.2	20.2	-34.8%
People's Rep. of China	20.4	20.5	17.9	18.3	20.4	18.6	21.9	22.3	24.9	26.8	28.3	38.7%
Hong Kong, China	-	-	-	-	0.2	0.2	0.2	0.2	0.3	0.3	0.3	x
China	19.5	19.9	17.5	18.0	20.2	18.4	21.8	22.2	24.8	26.7	28.2	44.6%
Argentina	49.8	50.8	40.1	40.0	34.3	37.2	34.0	35.9	35.7	33.1	32.6	-34.5%
Bolivia	52.4	43.3	51.5	41.3	34.0	34.2	32.2	33.8	28.6	29.4	21.9	-58.2%
Brazil	95.5	95.1	91.3	89.8	87.6	90.2	85.4	79.5	75.7	76.6	83.2	-12.9%
Colombia	76.4	76.4	75.5	80.2	72.1	83.5	79.6	69.4	69.3	64.0	65.9	-13.7%
Costa Rica	97.5	82.7	99.1	96.7	93.3	91.2	91.8	88.3	89.8	99.0	98.2	0.7%
Cuba	10.3	6.1	6.9	3.2	3.2	3.2	3.7	4.4	4.0	3.9	4.0	-61.2%
Curaçao ¹	-	0.8	0.7	5.7	4.8	4.8	22.0	23.6	25.8	27.9	26.2	x
Dominican Republic	10.1	11.8	9.2	17.9	11.9	12.1	14.6	16.4	13.1	11.4	15.7	55.4%
Ecuador	78.5	61.2	71.7	55.1	45.5	55.6	54.9	49.0	49.2	52.8	60.2	-23.3%
El Salvador	93.2	57.8	58.1	58.2	65.0	62.9	60.2	60.4	59.7	57.8	58.1	-37.7%
Guatemala	91.6	66.4	51.7	47.5	63.8	64.4	66.5	67.3	67.2	58.0	59.8	-34.7%
Haiti	79.4	51.1	51.7	47.7	30.2	17.6	20.1	13.4	8.7	8.0	6.5	-91.8%
Honduras	98.3	61.3	62.0	34.9	49.0	43.2	45.9	44.4	38.2	42.3	50.8	-48.3%
Jamaica	7.6	5.2	4.8	3.7	7.7	8.7	10.5	9.6	9.7	10.3	12.6	65.8%
Nicaragua	61.4	45.4	21.4	34.6	37.0	34.0	42.8	52.3	53.8	50.1	52.2	-15.0%
Panama	85.3	69.1	70.4	64.3	57.1	52.7	62.9	57.9	55.8	65.3	66.6	-21.9%
Paraguay	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	-
Peru	76.8	80.3	82.0	72.3	57.7	56.8	55.3	53.9	52.4	52.7	50.3	-34.5%
Suriname	100.0	100.0	88.4	52.7	70.2	60.6	63.2	59.9	62.3	60.1	56.9	-43.1%
Trinidad and Tobago	0.9	0.8	0.4	0.3	-	-	-	-	-	-	-	-100.0%
Uruguay	94.9	93.5	93.4	87.5	87.6	72.0	61.7	83.6	94.5	92.8	96.7	1.9%
Venezuela	62.3	70.1	73.7	73.3	67.5	70.9	67.4	67.8	69.1	61.0	60.1	-3.5%
Other non-OECD Americas	7.0	5.5	1.4	5.7	4.5	3.9	4.2	4.0	4.2	4.2	4.2	-40.0%
Non-OECD Americas	75.9	75.9	73.2	71.7	69.5	72.0	68.8	65.8	64.1	62.8	66.1	-12.9%
Bahrain	-	-	-	-	-	-	-	-	-	-	-	-
Islamic Republic of Iran	10.3	8.6	3.0	9.1	4.2	5.3	5.7	7.4	6.8	6.1	8.1	-21.4%
Iraq	10.8	1.9	1.9	19.7	9.7	6.3	9.5	8.1	4.3	3.7	4.2	-61.1%
Jordan	0.3	0.3	0.6	0.7	0.5	0.5	0.4	0.4	0.4	1.0	4.7	+
Kuwait	-	-	-	-	-	-	-	-	-	-	-	-
Lebanon	33.3	13.6	4.6	8.5	5.3	4.9	6.8	7.3	1.1	2.6	2.0	-94.0%
Oman	-	-	-	-	-	-	-	-	-	-	-	-
Qatar	-	-	-	-	-	-	-	-	-	-	-	-
Saudi Arabia	-	-	-	-	-	-	-	-	-	-	-	-
Syrian Arab Republic	23.5	15.1	12.8	12.4	5.6	7.8	9.2	11.9	11.0	2.3	5.1	-78.3%
United Arab Emirates	-	-	-	-	-	-	-	0.1	0.3	0.2	0.3	x
Yemen	-	-	-	-	-	-	0.1	0.1	1.4	9.1	14.5	x
Middle East	5.3	3.5	1.9	4.6	2.2	2.4	2.6	3.1	2.5	2.1	2.8	-47.2%

1. Please refer to the chapter Geographical coverage.

CO₂ EMISSIONS STATISTICS AND INDICATORS

GLOBAL AND REGIONAL TOTALS

World

Figure 1. CO₂ emissions by fuel

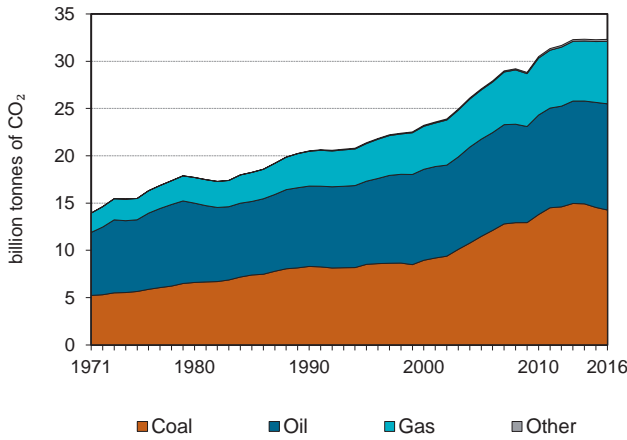


Figure 2. CO₂ emissions by sector

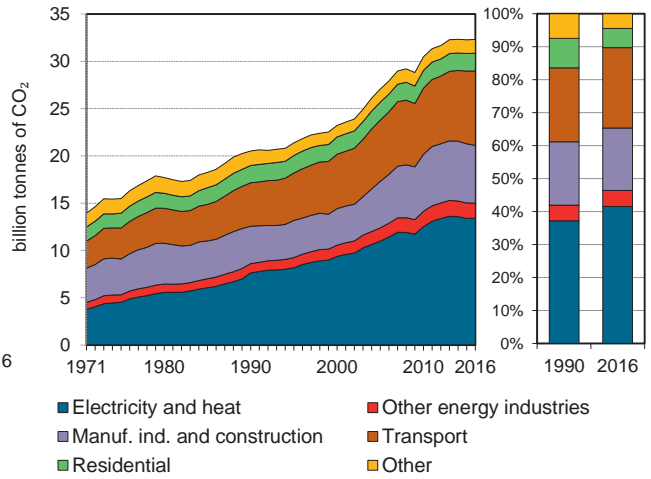


Figure 3. Electricity generation by fuel

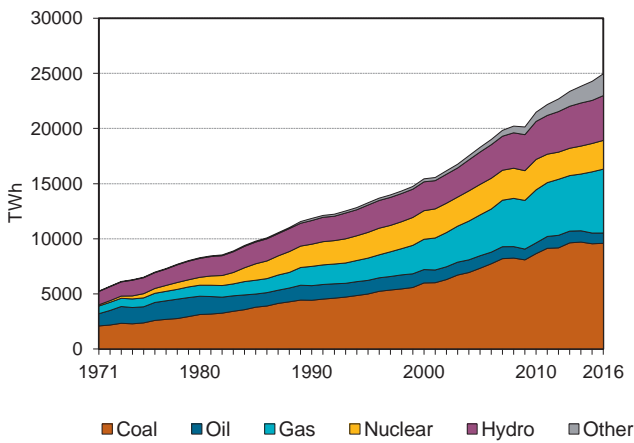


Figure 4. CO₂ from electricity generation: driving factors¹

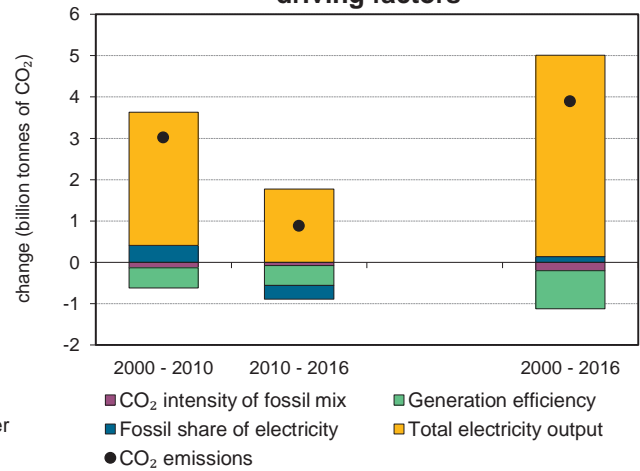


Figure 5. Changes in selected indicators

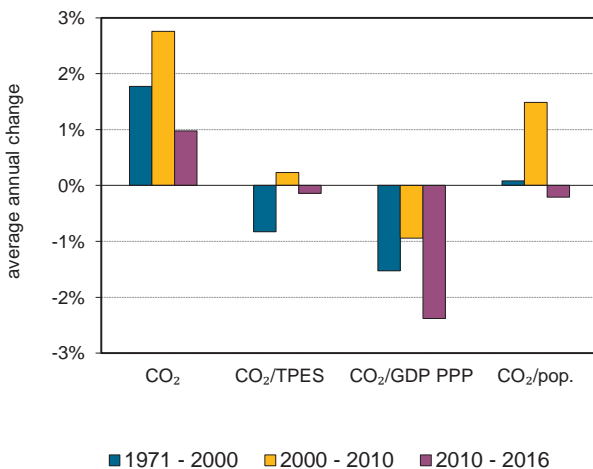
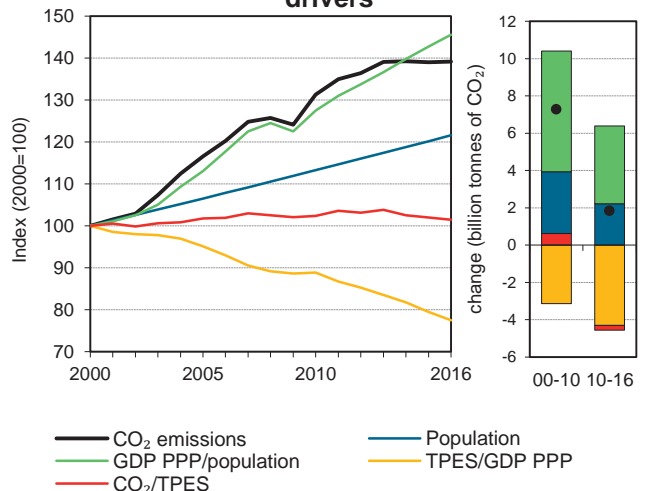


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

World

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	20518.2	21 379.6	23 223.4	27 069.7	30 489.9	32 276.0	32 314.2	57%
Share of World CO ₂ from fuel combustion	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
TPES (PJ)	367338	386 256	420 172	481 264	539 103	572 432	576 164	57%
GDP (billion 2010 USD)	37943.2	42 185.9	49 978.2	58 084.4	65 943.9	75 596.7	77 362.4	104%
GDP PPP (billion 2010 USD)	46097.2	51 473.8	61 738.5	74 363.9	89 110.1	105 887.0	109 230.7	137%
Population (millions)	5280.1	5 705.1	6 111.0	6 509.0	6 921.3	7 343.3	7 429.3	41%
CO ₂ / TPES (tCO ₂ per TJ)	55.9	55.4	55.3	56.2	56.6	56.4	56.1	0%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.54	0.5	0.5	0.5	0.5	0.4	0.4	-23%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.45	0.4	0.4	0.4	0.3	0.3	0.3	-33%
CO ₂ / population (tCO ₂ per capita)	3.9	3.7	3.8	4.2	4.4	4.4	4.4	12%
Share of electricity output from fossil fuels	63%	62%	65%	67%	68%	67%	66%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	532	533	537	541	528	504	490	-8%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	104	113	132	149	157	157	57%
Population index	100	108	116	123	131	139	141	41%
GDP PPP per population index	100	103	116	131	147	165	168	68%
Energy intensity index - TPES / GDP PPP	100	94	85	81	76	68	66	-34%
Carbon intensity index - CO ₂ / TPES	100	99	99	101	101	101	100	0%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	14 265.3	11 231.8	6 605.1	212.0	32 314.2	57%
Electricity and heat generation	9 539.9	789.7	2 935.0	147.8	13 412.4	76%
Other energy industry own use	306.1	601.8	683.6	1.3	1 592.9	63%
Manufacturing industries and construction	3 814.7	980.3	1 263.1	51.2	6 109.3	55%
Transport	0.3	7 626.4	239.3	x	7 866.0	71%
<i>of which: road</i>	x	5 754.0	98.6	x	5 852.6	77%
Other	604.2	1 233.6	1 484.0	11.8	3 333.6	-1%
<i>of which: residential</i>	286.6	584.4	1 012.9	x	1 883.9	3%
<i>of which: services</i>	134.4	255.8	440.3	6.4	836.8	8%
<i>Memo: international marine bunkers</i>	x	682.2	0.1	x	682.4	84%
<i>Memo: international aviation bunkers</i>	x	557.7	x	x	557.7	115%

2. Other includes industrial waste and non-renewable municipal waste. 3. World includes international marine bunkers and international aviation bunkers.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	8742.5	4618.6	17.8	17.8
Road - oil	5754.0	3299.1	11.7	29.5
Manufacturing industries - coal	3814.7	2059.7	7.8	37.2
Main activity prod. elec. and heat - gas	2462.4	1035.0	5.0	42.2
Other transport - oil	1872.4	1127.1	3.8	46.0
Manufacturing industries - gas	1263.1	851.0	2.6	48.6
Residential - gas	1012.9	645.6	2.1	50.7
Manufacturing industries - oil	980.3	1033.8	2.0	52.6
Unallocated autoproducers - coal	797.5	387.3	1.6	54.3
<i>Memo: total CO₂ from fuel combustion</i>	<i>32314.2</i>	<i>20518.2</i>	<i>65.7</i>	<i>65.7</i>

4. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Africa

Figure 1. CO₂ emissions by fuel

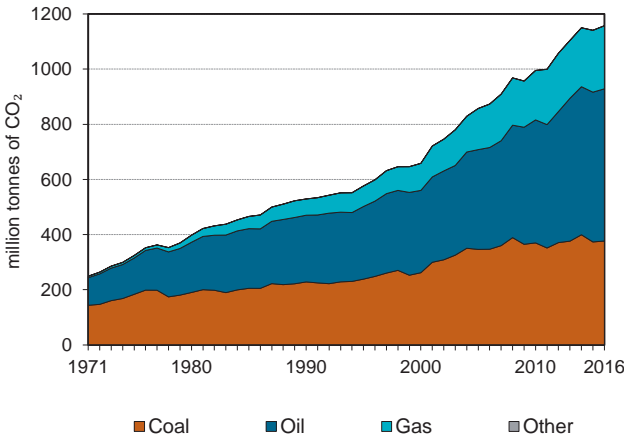


Figure 2. CO₂ emissions by sector

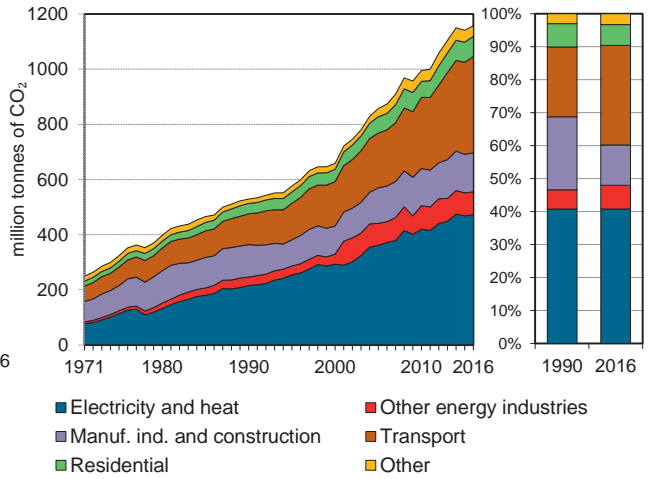


Figure 3. Electricity generation by fuel

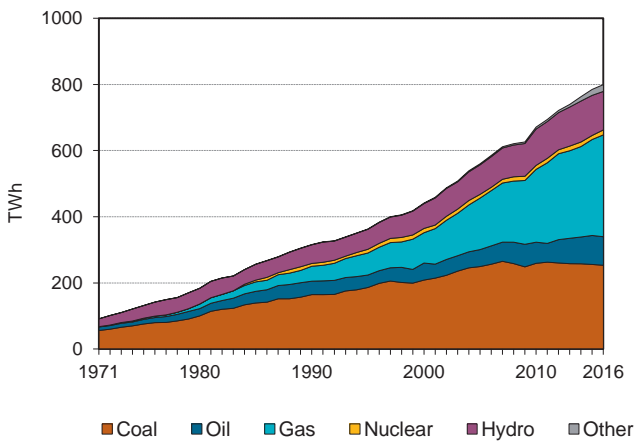


Figure 4. CO₂ from electricity generation: driving factors¹

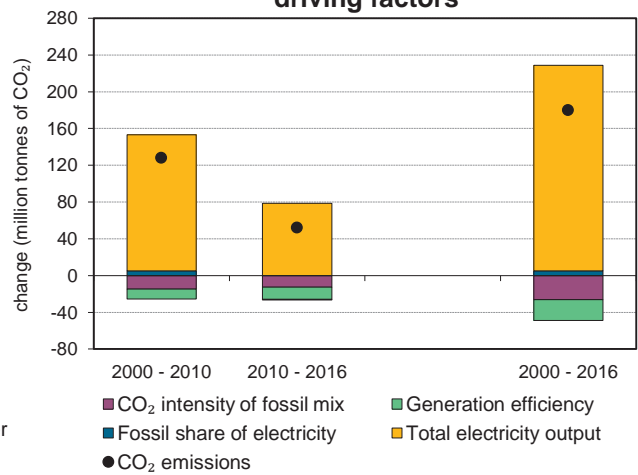


Figure 5. Changes in selected indicators

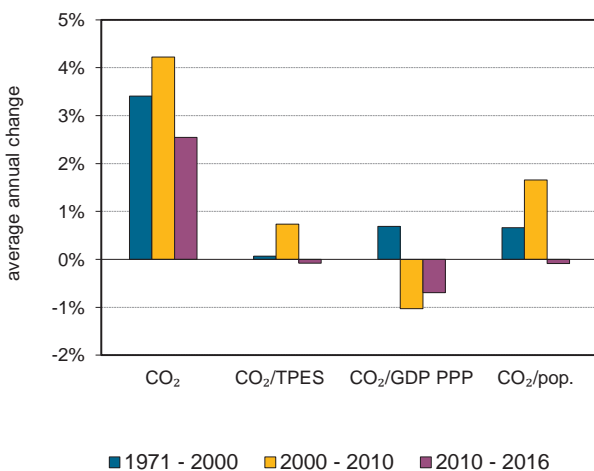
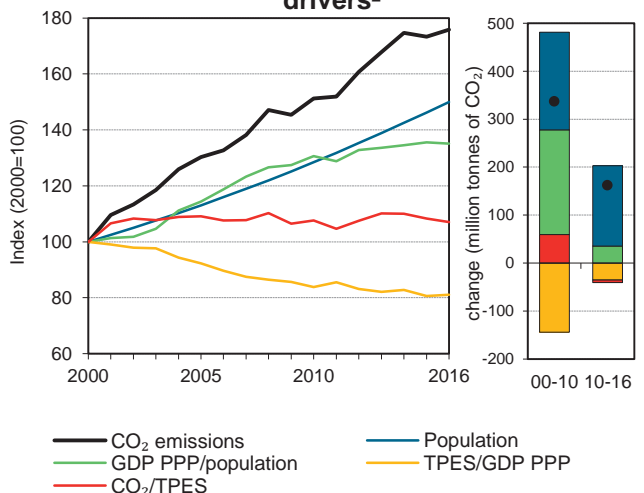


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Africa

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	529.1	576.4	658.3	857.4	995.4	1 141.0	1 157.6	119%
Share of World CO ₂ from fuel combustion	2.6%	2.7%	2.8%	3.2%	3.3%	3.5%	3.6%	
TPES (PJ)	16399	18 555	20 840	24 876	29 294	33 336	34 240	109%
GDP (billion 2010 USD)	926.9	975.4	1 165.3	1 511.7	1 951.6	2 304.5	2 345.3	153%
GDP PPP (billion 2010 USD)	2110	2 244.7	2 702.0	3 495.7	4 533.0	5 358.6	5 475.3	159%
Population (millions)	630.4	721.9	816.3	922.9	1 048.1	1 193.7	1 224.6	94%
CO ₂ / TPES (tCO ₂ per TJ)	32.3	31.1	31.6	34.5	34.0	34.2	33.8	5%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.57	0.6	0.6	0.6	0.5	0.5	0.5	-13%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.25	0.3	0.2	0.2	0.2	0.2	0.2	-16%
CO ₂ / population (tCO ₂ per capita)	0.8	0.8	0.8	0.9	1.0	1.0	0.9	13%
Share of electricity output from fossil fuels	79%	80%	80%	82%	81%	81%	81%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	681	700	664	645	625	595	589	-13%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	109	124	162	188	216	219	119%
Population index	100	115	129	146	166	189	194	94%
GDP PPP per population index	100	93	99	113	129	134	134	34%
Energy intensity index - TPES / GDP PPP	100	106	99	92	83	80	80	-20%
Carbon intensity index - CO ₂ / TPES	100	96	98	107	105	106	105	5%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	376.6	551.9	228.7	0.4	1 157.6	119%
Electricity and heat generation	266.7	67.6	137.8	-	472.1	119%
Other energy industry own use	41.6	10.5	31.2	-	83.3	170%
Manufacturing industries and construction	47.4	59.4	33.8	0.4	141.1	20%
Transport	0.0	346.9	3.0	-	349.9	213%
<i>of which: road</i>	-	334.8	0.8	-	335.6	214%
Other	20.8	67.4	22.9	-	111.2	108%
<i>of which: residential</i>	12.7	39.7	20.4	-	72.9	94%
<i>of which: services</i>	6.4	5.5	0.4	-	12.2	116%
<i>Memo: international marine bunkers</i>	-	18.9	-	-	18.9	14%
<i>Memo: international aviation bunkers</i>	-	22.5	-	-	22.5	91%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	334.8	106.8	10.5	10.5
Main activity prod. elec. and heat - coal	252.5	146.2	7.9	18.5
Main activity prod. elec. and heat - gas	130.5	25.1	4.1	22.6
Main activity prod. elec. and heat - oil	64.5	31.8	2.0	24.6
Manufacturing industries - oil	59.4	46.3	1.9	26.5
Manufacturing industries - coal	47.4	60.3	1.5	28.0
Other energy industry - coal	41.6	0.2	1.3	29.3
Residential - oil	39.7	28.6	1.2	30.5
Manufacturing industries - gas	33.8	10.8	1.1	31.6
<i>Memo: total CO₂ from fuel combustion</i>	<i>1 157.6</i>	<i>529.1</i>	<i>36.4</i>	<i>36.4</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Americas

Figure 1. CO₂ emissions by fuel

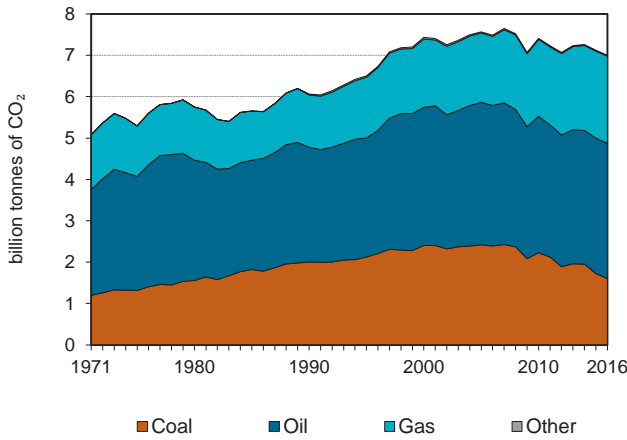


Figure 2. CO₂ emissions by sector

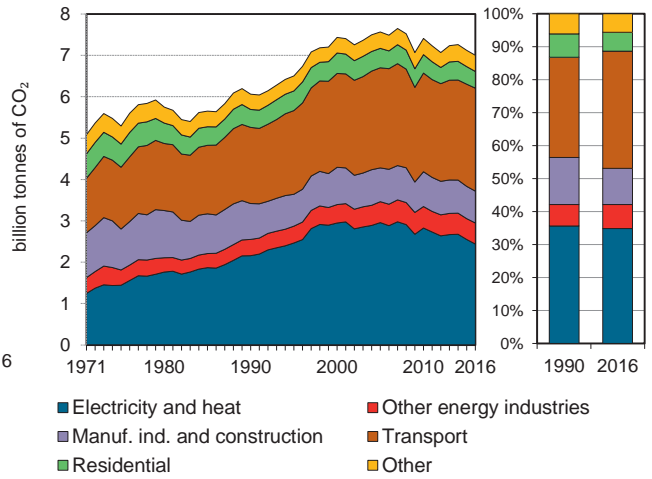


Figure 3. Electricity generation by fuel

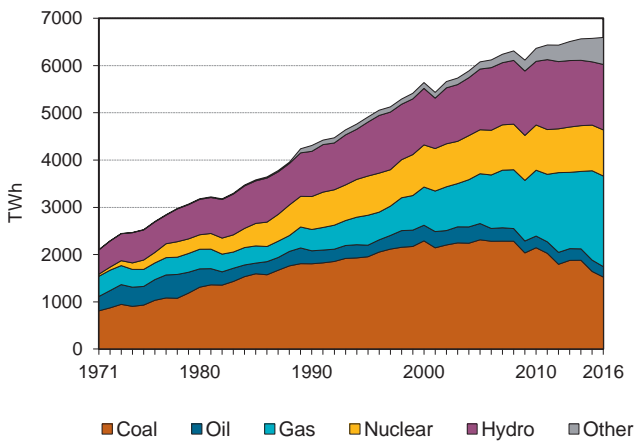


Figure 4. CO₂ from electricity generation: driving factors¹

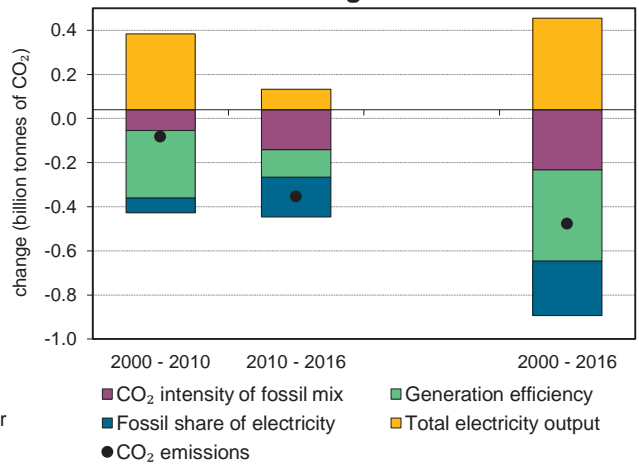


Figure 5. Changes in selected indicators

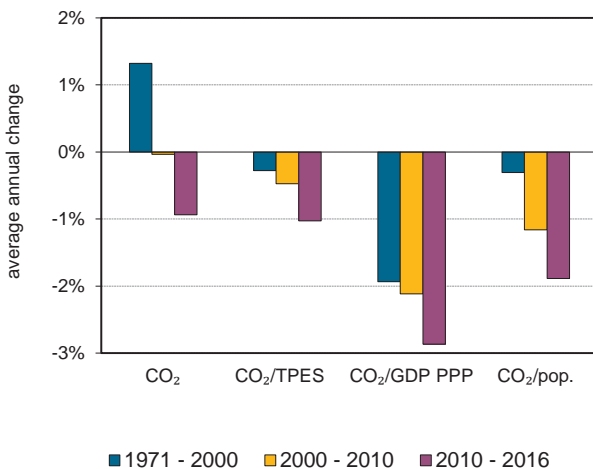
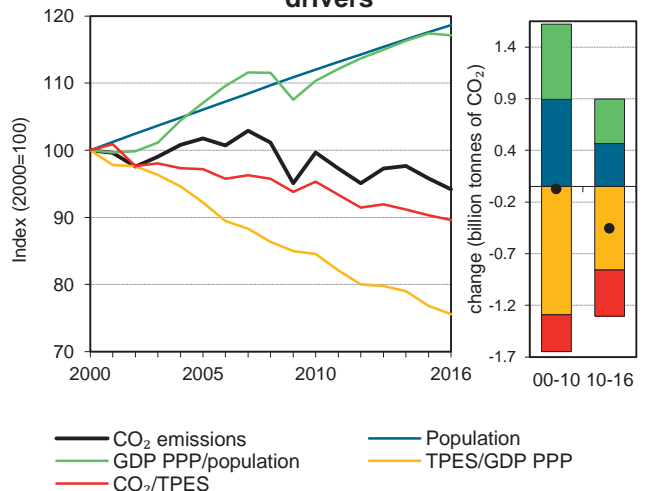


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Americas

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	6062.5	6 504.0	7 435.2	7 566.6	7 410.5	7 122.4	7 003.4	16%
Share of World CO ₂ from fuel combustion	29.6%	30.4%	32.0%	28.0%	24.3%	22.1%	21.7%	
TPES (PJ)	108464	118 124	130 943	137 119	136 877	138 866	137 609	27%
GDP (billion 2010 USD)	12893.9	14 710.5	17 877.9	20 287.3	21 825.1	24 304.6	24 481.6	90%
GDP PPP (billion 2010 USD)	14143.9	16 173.0	19 595.6	22 248.1	24 219.1	27 052.6	27 238.4	93%
Population (millions)	721.5	779.2	834.0	884.5	934.2	980.6	989.7	37%
CO ₂ / TPES (tCO ₂ per TJ)	55.9	55.1	56.8	55.2	54.1	51.3	50.9	-9%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.47	0.4	0.4	0.4	0.3	0.3	0.3	-39%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.43	0.4	0.4	0.3	0.3	0.3	0.3	-40%
CO ₂ / population (tCO ₂ per capita)	8.4	8.3	8.9	8.6	7.9	7.3	7.1	-16%
Share of electricity output from fossil fuels	59%	58%	61%	61%	60%	58%	56%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	500	496	518	483	438	384	365	-27%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	107	123	125	122	117	116	16%
Population index	100	108	116	123	129	136	137	37%
GDP PPP per population index	100	106	120	128	132	141	140	40%
Energy intensity index - TPES / GDP PPP	100	95	87	80	74	67	66	-34%
Carbon intensity index - CO ₂ / TPES	100	99	102	99	97	92	91	-9%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	1 602.0	3 270.1	2 110.1	21.2	7 003.4	16%
Electricity and heat generation	1 446.0	156.3	821.2	16.8	2 440.3	13%
Other energy industry own use	13.1	200.8	295.0	-	508.9	29%
Manufacturing industries and construction	140.4	211.2	415.5	3.6	770.7	-11%
Transport	-	2 422.0	67.4	-	2 489.4	35%
<i>of which: road</i>	-	2 140.2	15.8	-	2 156.0	43%
Other	2.5	279.9	511.0	0.9	794.2	-1%
<i>of which: residential</i>	0.3	102.1	300.9	-	403.3	-7%
<i>of which: services</i>	2.1	64.6	203.1	0.9	270.7	2%
<i>Memo: international marine bunkers</i>	-	101.1	-	-	101.1	-12%
<i>Memo: international aviation bunkers</i>	-	117.7	-	-	117.7	108%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	2140.2	1511.7	20.3	20.3
Main activity prod. elec. and heat - coal	1413.7	1663.5	13.4	33.6
Main activity prod. elec. and heat - gas	736.0	188.7	7.0	40.6
Manufacturing industries - gas	415.5	354.6	3.9	44.5
Residential - gas	300.9	279.4	2.8	47.4
Other energy industry own use - gas	295.0	166.7	2.8	50.2
Other transport - oil	281.8	285.5	2.7	52.8
Manufacturing industries - oil	211.2	249.8	2.0	54.8
Non-specified other - gas	210.0	169.2	2.0	56.8
<i>Memo: total CO₂ from fuel combustion</i>	<i>7003.4</i>	<i>6062.5</i>	<i>66.3</i>	<i>66.3</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Asia

Figure 1. CO₂ emissions by fuel

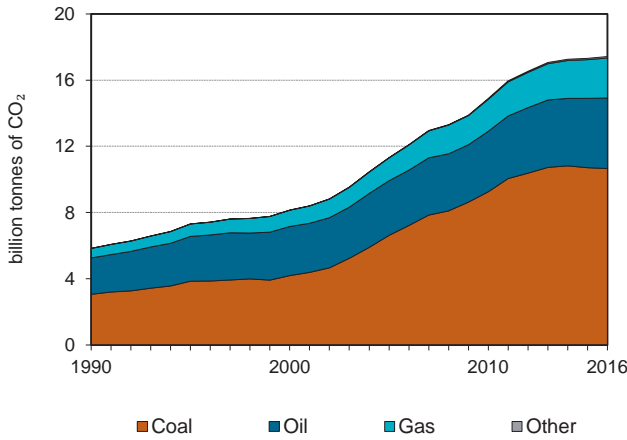


Figure 2. CO₂ emissions by sector

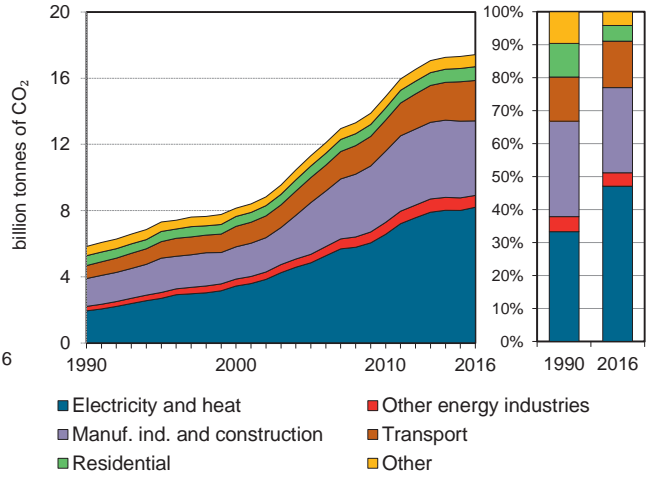


Figure 3. Electricity generation by fuel

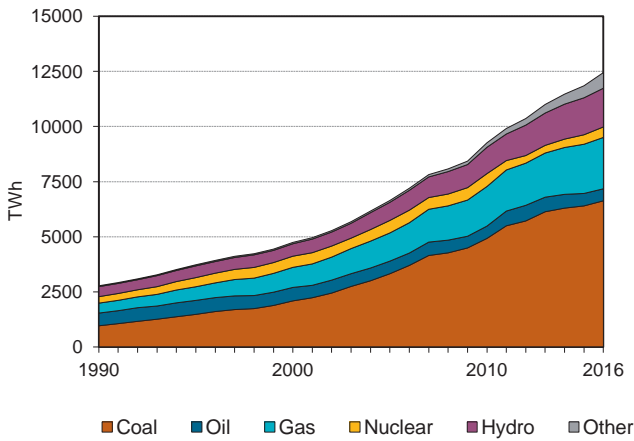


Figure 4. CO₂ from electricity generation: driving factors¹

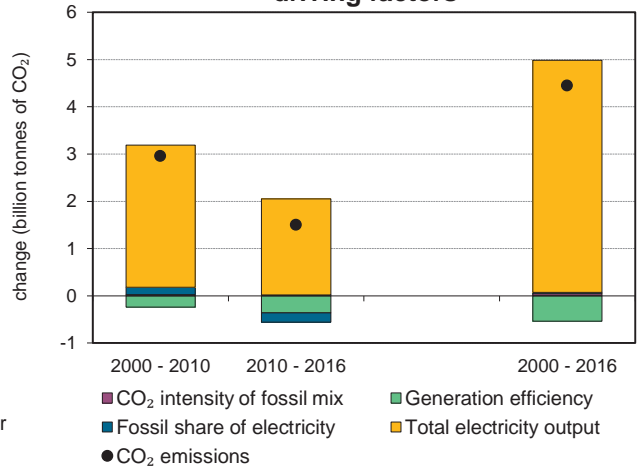


Figure 5. Changes in selected indicators

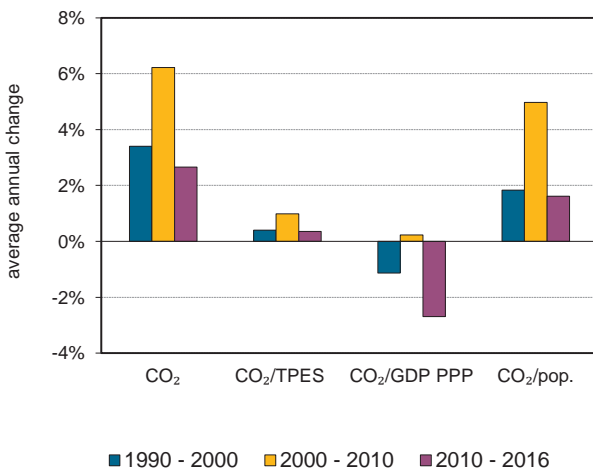
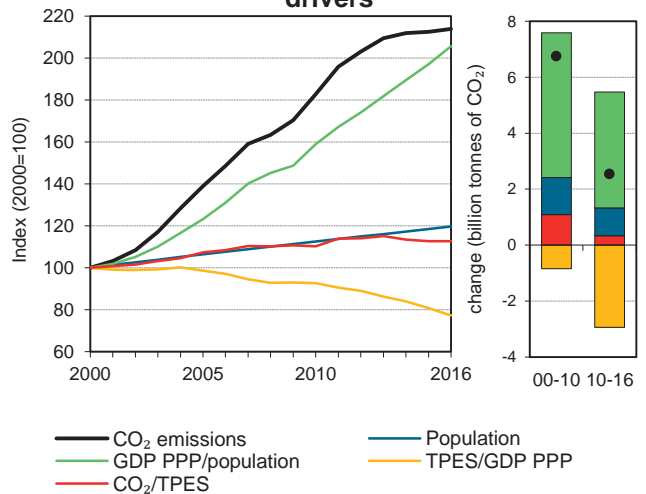


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Asia

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	5832.8	7 312.1	8 147.3	11 317.9	14 892.1	17 316.9	17 426.7	199%
Share of World CO ₂ from fuel combustion	28.4%	34.2%	35.1%	41.8%	48.8%	53.7%	53.9%	
TPES (PJ)	107815	128 695	144 645	187 107	239 751	272 803	274 730	155%
GDP (billion 2010 USD)	9086.1	11 026.7	13 083.3	16 284.8	20 889.5	26 325.6	27 471.6	202%
GDP PPP (billion 2010 USD)	13628.4	17 259.9	21 314.1	27 940.5	38 113.5	49 770.7	52 412.8	285%
Population (millions)	3178.8	3 447.7	3 703.2	3 939.2	4 166.5	4 386.5	4 430.1	39%
CO ₂ / TPES (tCO ₂ per TJ)	54.1	56.8	56.3	60.5	62.1	63.5	63.4	17%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.64	0.7	0.6	0.7	0.7	0.7	0.6	-1%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.43	0.4	0.4	0.4	0.4	0.3	0.3	-22%
CO ₂ / population (tCO ₂ per capita)	1.8	2.1	2.2	2.9	3.6	3.9	3.9	114%
Share of electricity output from fossil fuels	72%	73%	76%	78%	79%	78%	77%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	641	674	670	680	664	632	614	-4%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	125	140	194	255	297	299	199%
Population index	100	108	116	124	131	138	139	39%
GDP PPP per population index	100	117	134	165	213	265	276	176%
Energy intensity index - TPES / GDP PPP	100	94	86	85	80	69	66	-34%
Carbon intensity index - CO ₂ / TPES	100	105	104	112	115	117	117	17%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	10 658.9	4 260.5	2 420.6	86.8	17 426.7	199%
Electricity and heat generation	6 515.1	478.2	1 150.4	59.0	8 202.7	323%
Other energy industry own use	204.5	255.4	254.9	-	714.9	165%
Manufacturing industries and construction	3 422.2	555.3	509.7	19.2	4 506.3	168%
Transport	0.2	2 354.0	86.3	-	2 440.5	212%
<i>of which: road</i>	-	2 102.0	77.1	-	2 179.1	225%
Other	516.9	617.6	419.4	8.6	1 562.4	35%
<i>of which: residential</i>	225.0	313.1	296.0	-	834.0	39%
<i>of which: services</i>	115.3	124.4	115.7	3.5	358.9	97%
<i>Memo: international marine bunkers</i>	-	372.3	-	-	372.3	236%
<i>Memo: international aviation bunkers</i>	-	238.1	-	-	238.1	218%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	5901.2	1114.5	22.6	22.6
Manufacturing industries - coal	3422.2	1167.4	13.1	35.6
Road - oil	2102.0	670.5	8.0	43.7
Main activity prod. elec. and heat - gas	996.7	240.3	3.8	47.5
Unallocated autoproducers - coal	613.9	83.7	2.3	49.8
Manufacturing industries - oil	555.3	408.2	2.1	51.9
Manufacturing industries - gas	509.7	106.7	1.9	53.9
Main activity prod. elec. and heat - oil	384.7	418.1	1.5	55.4
Residential - oil	313.1	170.9	1.2	56.6
<i>Memo: total CO₂ from fuel combustion</i>	<i>17426.7</i>	<i>5832.8</i>	<i>66.6</i>	<i>66.6</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Europe

Figure 1. CO₂ emissions by fuel

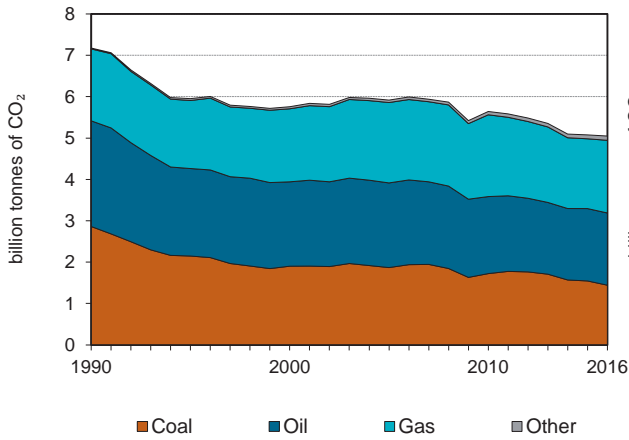


Figure 2. CO₂ emissions by sector

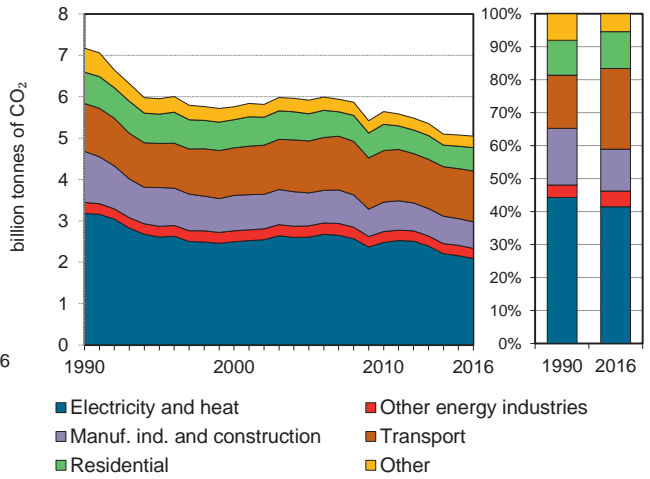


Figure 3. Electricity generation by fuel

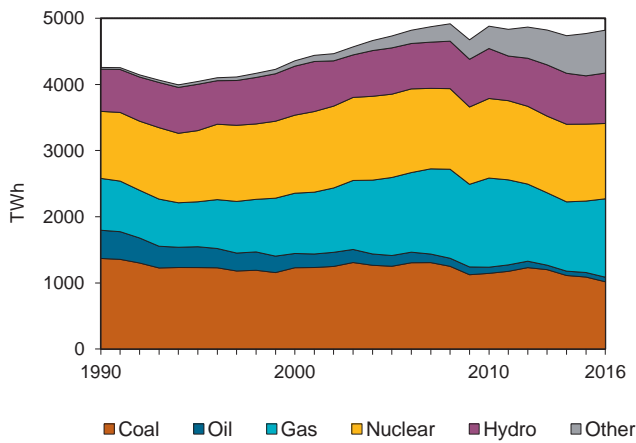


Figure 4. CO₂ from electricity generation: driving factors¹

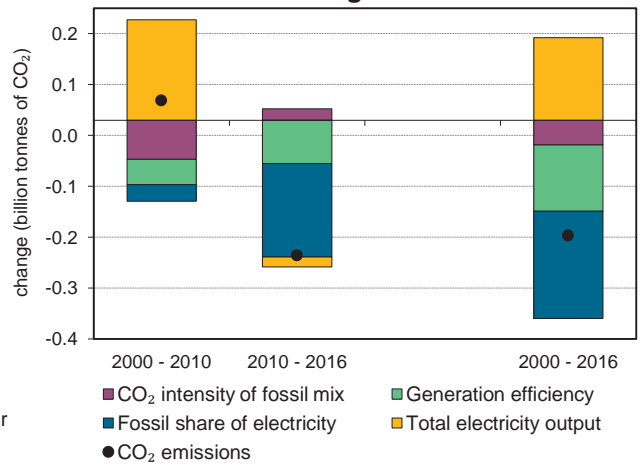


Figure 5. Changes in selected indicators

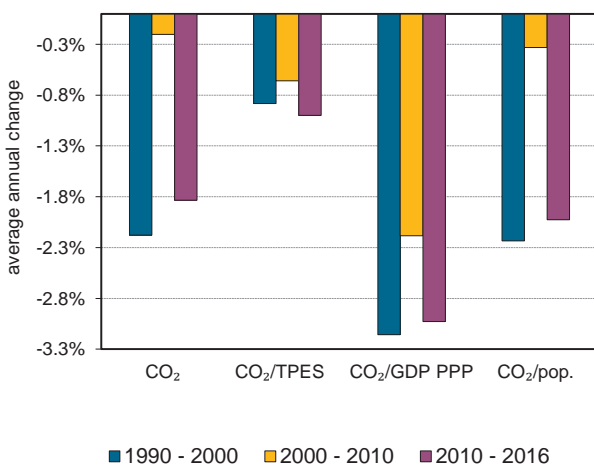
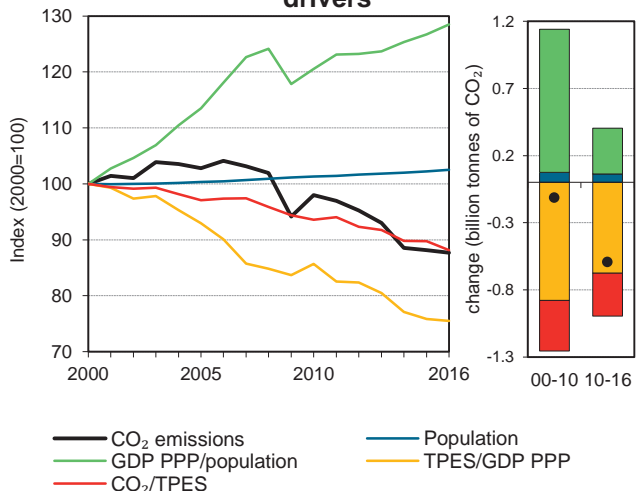


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Europe

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	7176.2	5 953.3	5 757.6	5 917.5	5 642.0	5 076.6	5 048.6	-30%
Share of World CO ₂ from fuel combustion	35.0%	27.9%	24.8%	21.9%	18.5%	15.7%	15.6%	
TPES (PJ)	121900	106 586	106 862	113 154	111 867	104 978	106 315	-13%
GDP (billion 2010 USD)	14261.8	14 565.2	16 760.5	18 708.9	19 806.4	20 965.1	21 331.2	50%
GDP PPP (billion 2010 USD)	15624.2	15 101.5	17 295.7	19 695.9	21 124.2	22 410.5	22 781.9	46%
Population (millions)	722.6	727.5	726.6	729.1	736.1	743.0	744.8	3%
CO ₂ / TPES (tCO ₂ per TJ)	58.9	55.9	53.9	52.3	50.4	48.4	47.5	-19%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.5	0.4	0.3	0.3	0.3	0.2	0.2	-53%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.46	0.4	0.3	0.3	0.3	0.2	0.2	-52%
CO ₂ / population (tCO ₂ per capita)	9.9	8.2	7.9	8.1	7.7	6.8	6.8	-32%
Share of electricity output from fossil fuels	61%	55%	54%	55%	53%	48%	48%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	475	425	394	395	361	328	310	-35%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	83	80	82	79	71	70	-30%
Population index	100	101	101	101	102	103	103	3%
GDP PPP per population index	100	96	110	125	133	139	141	41%
Energy intensity index - TPES / GDP PPP	100	90	79	74	68	60	60	-40%
Carbon intensity index - CO ₂ / TPES	100	95	92	89	86	82	81	-19%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	1 443.4	1 745.1	1 757.1	103.0	5 048.6	-30%
Electricity and heat generation	1 146.6	78.4	794.5	71.9	2 091.4	-34%
Other energy industry own use	41.3	122.3	78.1	1.3	243.0	-9%
Manufacturing industries and construction	191.6	139.5	284.1	27.4	642.7	-48%
Transport	0.1	1 149.4	81.9	-	1 231.5	6%
<i>of which: road</i>	-	1 080.2	4.7	-	1 084.9	14%
Other	63.8	255.4	518.5	2.4	840.1	-37%
<i>of which: residential</i>	48.6	128.0	386.9	-	563.4	-25%
<i>of which: services</i>	10.4	58.4	117.8	2.0	188.6	-40%
<i>Memo: international marine bunkers</i>	-	186.4	0.1	-	186.5	48%
<i>Memo: international aviation bunkers</i>	-	164.0	-	-	164.0	49%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	1080.2	946.5	14.9	14.9
Main activity prod. elec. and heat - coal	1011.0	1578.9	14.0	28.9
Main activity prod. elec. and heat - gas	574.6	571.0	7.9	36.8
Residential - gas	386.9	315.0	5.3	42.2
Manufacturing industries - gas	284.1	362.9	3.9	46.1
Unallocated autoproducers - gas	219.8	240.2	3.0	49.1
Manufacturing industries - coal	191.6	547.3	2.6	51.8
Manufacturing industries - oil	139.5	319.4	1.9	53.7
Unallocated autoproducers - coal	135.6	263.7	1.9	55.6
<i>Memo: total CO₂ from fuel combustion</i>	<i>5048.6</i>	<i>7176.2</i>	<i>69.7</i>	<i>69.7</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Oceania

Figure 1. CO₂ emissions by fuel

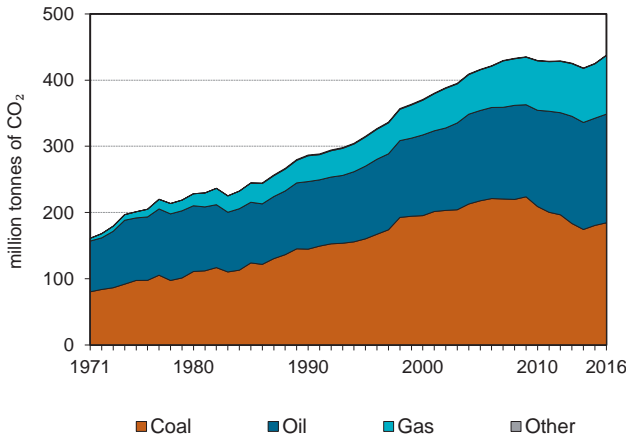


Figure 2. CO₂ emissions by sector

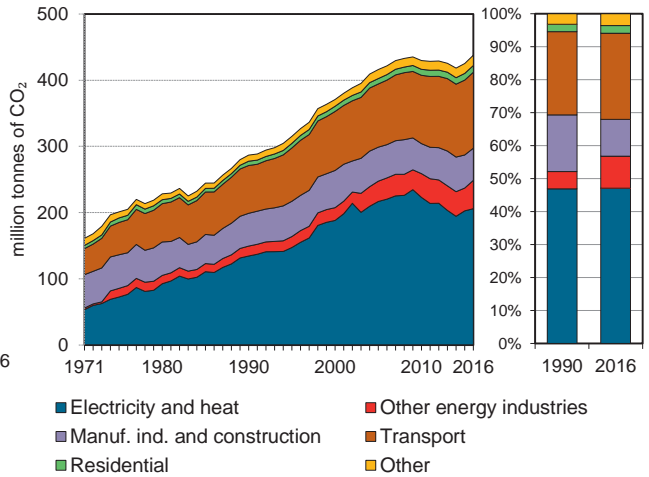


Figure 3. Electricity generation by fuel

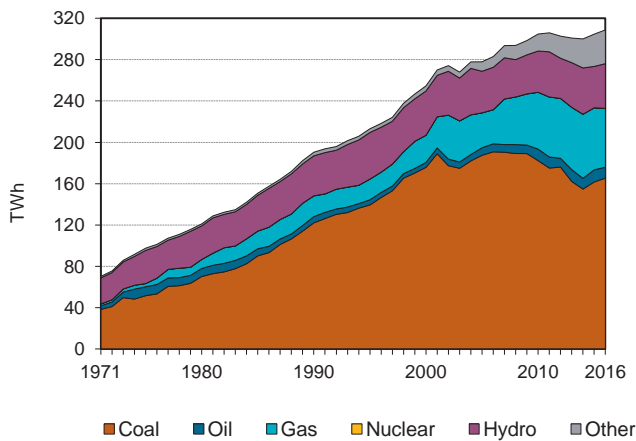


Figure 4. CO₂ from electricity generation: driving factors¹

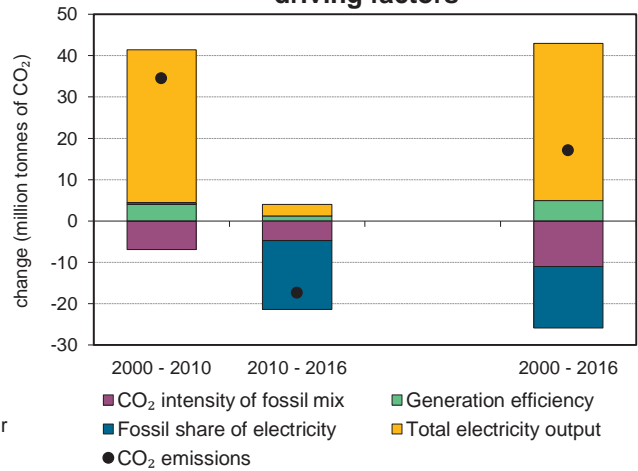


Figure 5. Changes in selected indicators

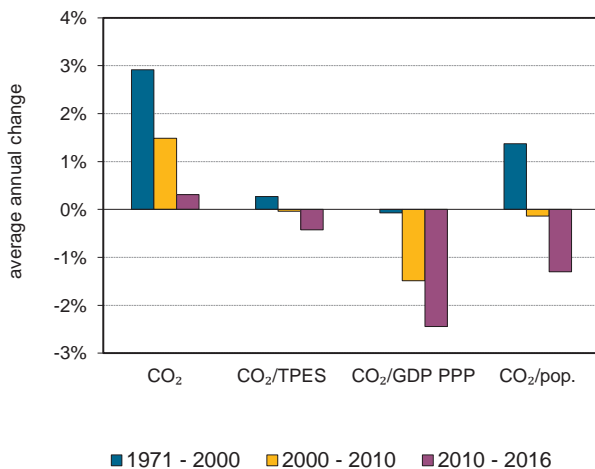
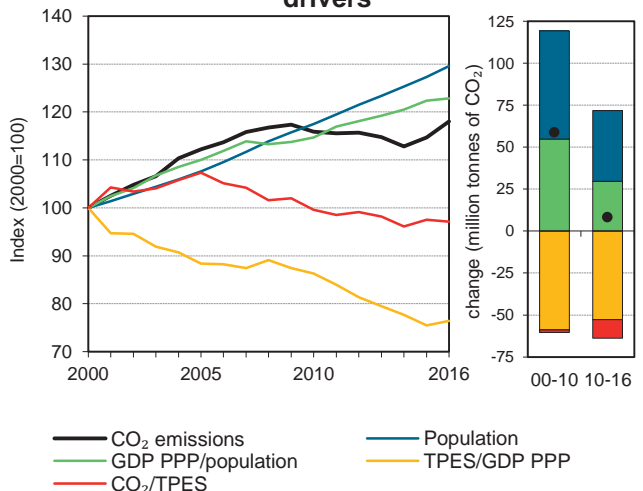


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Oceania

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	286.9	315.2	370.9	416.2	429.7	425.2	437.8	53%
Share of World CO ₂ from fuel combustion	1.4%	1.5%	1.6%	1.5%	1.4%	1.3%	1.4%	
TPES (PJ)	4291	4 657	5 417	5 665	6 300	6 371	6 585	53%
GDP (billion 2010 USD)	774.5	908.0	1 091.0	1 291.7	1 471.3	1 697.0	1 732.8	124%
GDP PPP (billion 2010 USD)	590.7	694.7	831.2	983.7	1 120.3	1 294.5	1 322.2	124%
Population (millions)	26.9	28.9	30.9	33.3	36.4	39.4	40.1	49%
CO ₂ / TPES (tCO ₂ per TJ)	66.9	67.7	68.5	73.5	68.2	66.7	66.5	-1%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.37	0.3	0.3	0.3	0.3	0.3	0.3	-32%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.49	0.5	0.4	0.4	0.4	0.3	0.3	-32%
CO ₂ / population (tCO ₂ per capita)	10.7	10.9	12.0	12.5	11.8	10.8	10.9	2%
Share of electricity output from fossil fuels	78%	77%	81%	82%	82%	77%	75%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	705	691	739	780	731	665	667	-5%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	110	129	145	150	148	153	53%
Population index	100	108	115	124	135	147	149	49%
GDP PPP per population index	100	109	122	134	140	149	150	50%
Energy intensity index - TPES / GDP PPP	100	92	90	79	77	68	69	-31%
Carbon intensity index - CO ₂ / TPES	100	101	102	110	102	100	99	-1%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	184.5	164.2	88.6	0.6	437.8	53%
Electricity and heat generation	165.6	9.2	31.2	-	206.0	53%
Other energy industry own use	5.6	12.8	24.4	-	42.8	186%
Manufacturing industries and construction	13.0	14.9	20.1	0.6	48.6	-2%
Transport	-	114.1	0.7	-	114.7	59%
<i>of which: road</i>	-	96.8	0.2	-	97.0	52%
Other	0.3	13.2	12.3	-	25.7	64%
<i>of which: residential</i>	0.0	1.5	8.7	-	10.2	57%
<i>of which: services</i>	0.1	2.9	3.4	-	6.4	67%
<i>Memo: international marine bunkers</i>	-	3.5	-	-	3.5	3%
<i>Memo: international aviation bunkers</i>	-	15.4	-	-	15.4	150%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	164.1	115.5	22.6	22.6
Road - oil	96.8	63.7	13.4	36.0
Main activity prod. elec. and heat - gas	24.6	10.0	3.4	39.4
Other energy industry own use - gas	24.4	5.0	3.4	42.8
Manufacturing industries - gas	20.1	16.0	2.8	45.5
Other transport - oil	17.3	8.1	2.4	47.9
Manufacturing industries - oil	14.9	10.2	2.1	50.0
Manufacturing industries - coal	13.0	22.2	1.8	51.8
Other energy industry own use - oil	12.8	7.3	1.8	53.5
<i>Memo: total CO₂ from fuel combustion</i>	<i>437.8</i>	<i>286.9</i>	<i>60.4</i>	<i>60.4</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

CO₂ EMISSIONS STATISTICS AND INDICATORS

UNFCCC ANNEXES

Annex I Parties

Figure 1. CO₂ emissions by fuel

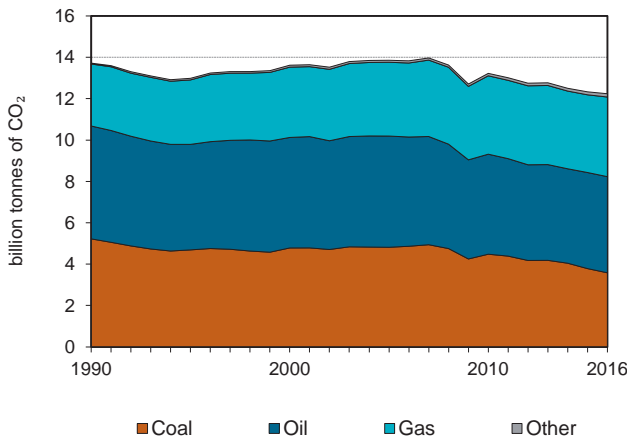


Figure 2. CO₂ emissions by sector

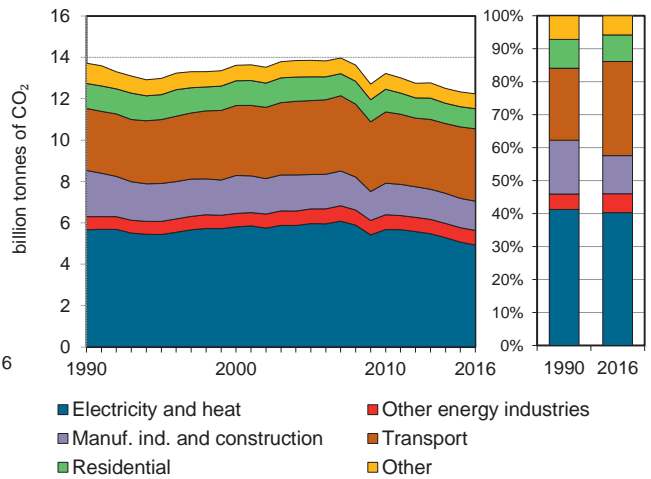


Figure 3. Electricity generation by fuel

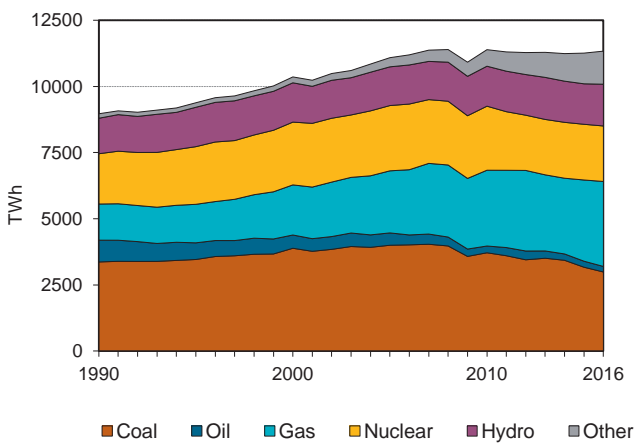


Figure 4. CO₂ from electricity generation: driving factors¹

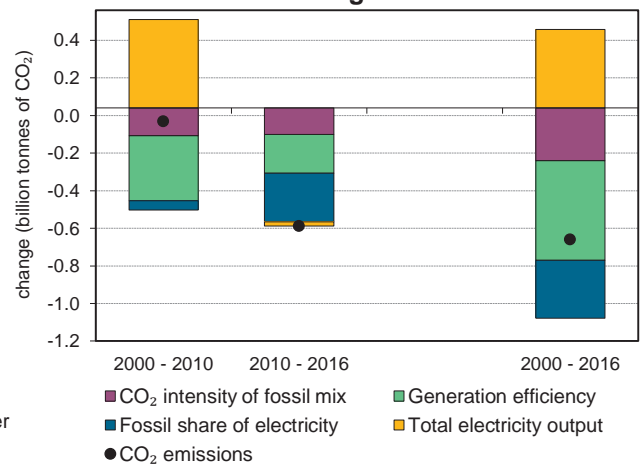


Figure 5. Changes in selected indicators

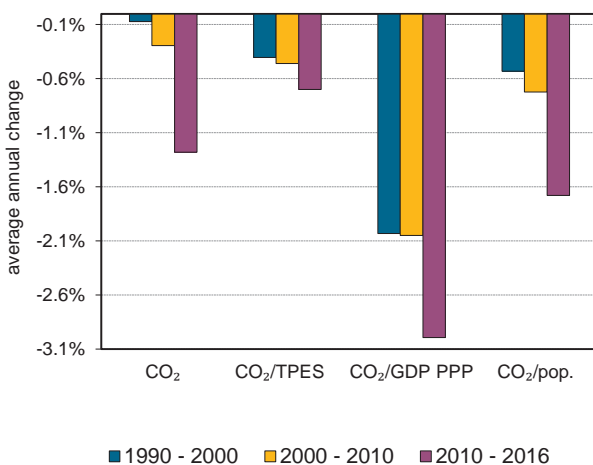
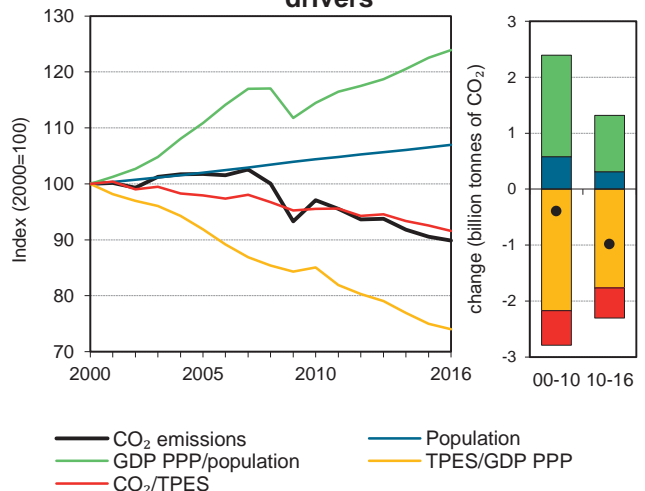


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Annex I Parties

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	13719.3	12 986.3	13 619.4	13 858.0	13 224.1	12 332.1	12 239.8	-11%
Share of World CO ₂ from fuel combustion	66.9%	60.7%	58.7%	51.2%	43.4%	38.2%	37.9%	
TPES (PJ)	233874	229 708	241 737	251 208	245 766	236 541	237 250	1%
GDP (billion 2010 USD)	30125.6	32 317.0	37 715.7	42 181.5	44 230.9	48 109.5	48 872.5	62%
GDP PPP (billion 2010 USD)	30298.8	31 592.7	36 888.3	41 719.8	44 089.6	48 139.9	48 902.0	61%
Population (millions)	1176.9	1 208.1	1 232.2	1 256.8	1 286.5	1 312.5	1 318.2	12%
CO ₂ / TPES (tCO ₂ per TJ)	58.7	56.5	56.3	55.2	53.8	52.1	51.6	-12%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.46	0.4	0.4	0.3	0.3	0.3	0.3	-45%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.45	0.4	0.4	0.3	0.3	0.3	0.3	-45%
CO ₂ / population (tCO ₂ per capita)	11.7	10.7	11.1	11.0	10.3	9.4	9.3	-20%
Share of electricity output from fossil fuels	62%	59%	61%	62%	60%	58%	57%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	503	481	482	469	432	395	379	-25%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	95	99	101	96	90	89	-11%
Population index	100	103	105	107	109	112	112	12%
GDP PPP per population index	100	102	116	129	133	142	144	44%
Energy intensity index - TPES / GDP PPP	100	94	85	78	72	64	63	-37%
Carbon intensity index - CO ₂ / TPES	100	96	96	94	92	89	88	-12%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	3 583.8	4 647.3	3 850.7	157.9	12 239.8	-11%
Electricity and heat generation	2 994.4	173.3	1 653.7	108.9	4 930.3	-13%
Other energy industry own use	78.1	309.7	313.2	1.3	702.3	10%
Manufacturing industries and construction	424.0	285.8	670.4	37.6	1 417.9	-37%
Transport	0.1	3 363.1	132.8	-	3 496.0	17%
<i>of which: road</i>	-	2 999.3	7.6	-	3 006.9	23%
Other	87.2	515.5	1 080.6	10.1	1 693.4	-22%
<i>of which: residential</i>	55.7	211.1	708.7	-	975.5	-19%
<i>of which: services</i>	26.7	147.8	352.3	4.7	531.4	-17%
<i>Memo: international marine bunkers</i>	-	250.9	0.1	-	251.0	6%
<i>Memo: international aviation bunkers</i>	-	284.9	-	-	284.9	66%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	2999.3	2449.8	17.9	17.9
Main activity prod. elec. and heat - coal	2780.7	3407.1	16.6	34.4
Main activity prod. elec. and heat - gas	1369.2	814.0	8.2	42.6
Residential - gas	708.7	604.1	4.2	46.8
Manufacturing industries - gas	670.4	685.5	4.0	50.8
Manufacturing industries - coal	424.0	946.0	2.5	53.4
Non-specified other - gas	371.9	286.3	2.2	55.6
Other transport - oil	363.7	423.5	2.2	57.7
Other energy industry own use - gas	313.2	182.2	1.9	59.6
<i>Memo: total CO₂ from fuel combustion</i>	<i>12239.8</i>	<i>13719.3</i>	<i>72.9</i>	<i>72.9</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Annex II Parties

Figure 1. CO₂ emissions by fuel

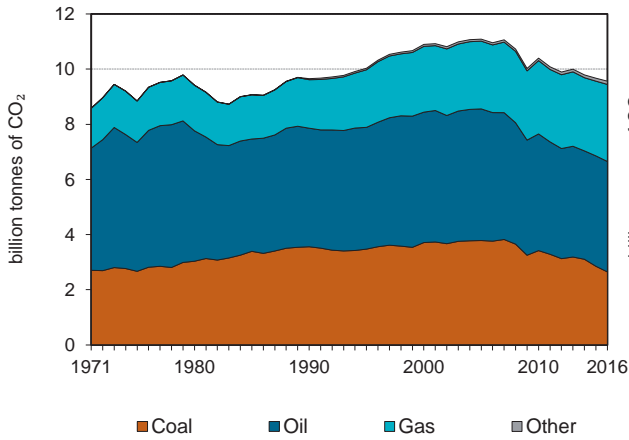


Figure 2. CO₂ emissions by sector

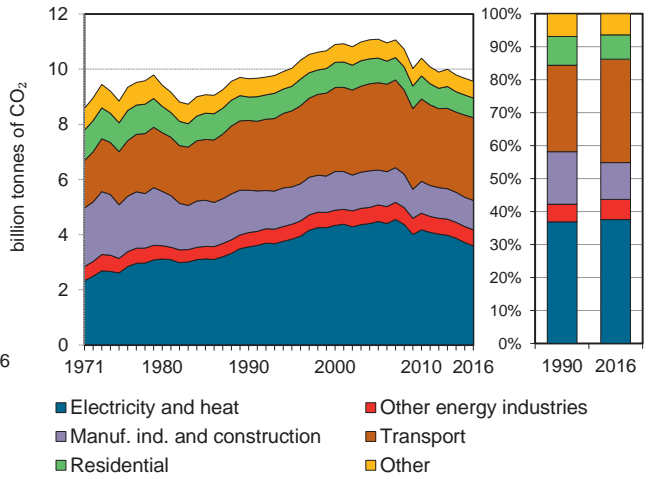


Figure 3. Electricity generation by fuel

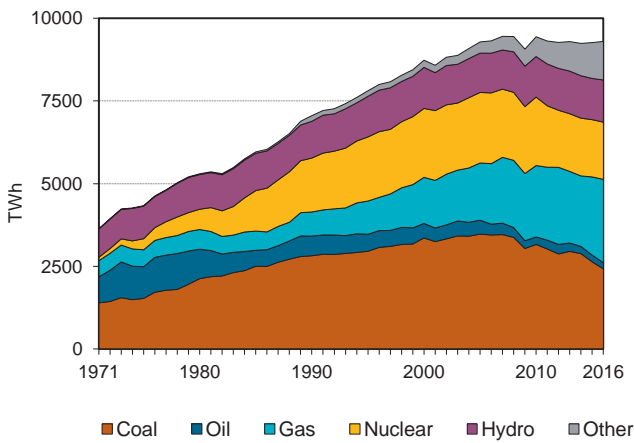


Figure 4. CO₂ from electricity generation: driving factors¹

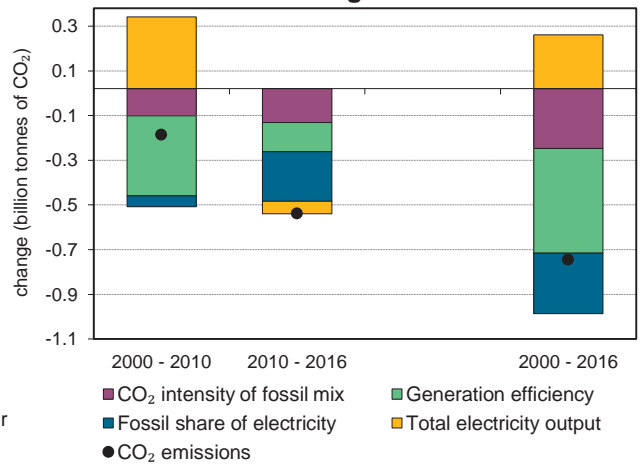


Figure 5. Changes in selected indicators

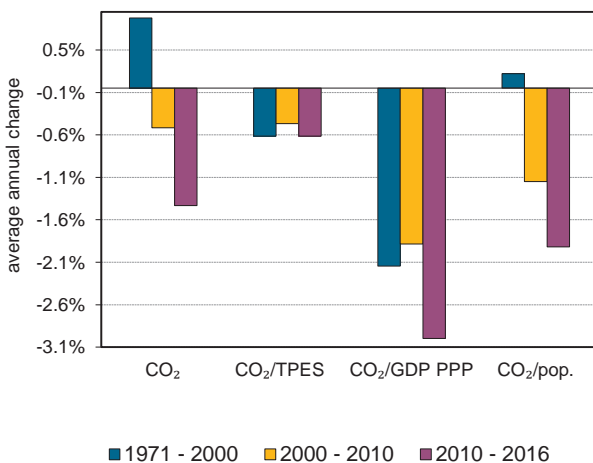
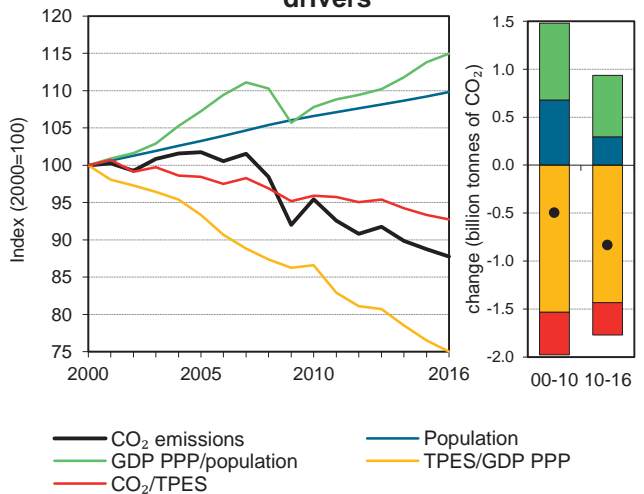


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Annex II Parties

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	9654.2	10 032.4	10 896.4	11 087.4	10 397.8	9 670.4	9 563.6	-1%
Share of World CO ₂ from fuel combustion	47.1%	46.9%	46.9%	41.0%	34.1%	30.0%	29.6%	
TPES (PJ)	168030	180 490	195 049	201 587	194 069	185 449	184 647	10%
GDP (billion 2010 USD)	27286	30 085.9	35 177.7	38 904.4	40 392.6	43 699.2	44 383.4	63%
GDP PPP (billion 2010 USD)	24980.5	27 575.7	32 359.4	35 832.9	37 186.0	40 221.3	40 852.7	64%
Population (millions)	799.8	827.7	852.7	880.6	908.9	931.4	936.3	17%
CO ₂ / TPES (tCO ₂ per TJ)	57.5	55.6	55.9	55.0	53.6	52.1	51.8	-10%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.35	0.3	0.3	0.3	0.3	0.2	0.2	-39%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.39	0.4	0.3	0.3	0.3	0.2	0.2	-39%
CO ₂ / population (tCO ₂ per capita)	12.1	12.1	12.8	12.6	11.4	10.4	10.2	-15%
Share of electricity output from fossil fuels	59%	58%	60%	61%	59%	57%	56%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	494	479	483	467	426	387	372	-25%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	104	113	115	108	100	99	-1%
Population index	100	103	107	110	114	116	117	17%
GDP PPP per population index	100	107	121	130	131	138	140	40%
Energy intensity index - TPES / GDP PPP	100	97	90	84	78	69	67	-33%
Carbon intensity index - CO ₂ / TPES	100	97	97	96	93	91	90	-10%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	2 648.1	4 002.8	2 795.6	117.1	9 563.6	-1%
Electricity and heat generation	2 299.3	133.1	1 075.0	84.0	3 591.3	1%
Other energy industry own use	56.2	257.6	275.2	0.5	589.5	14%
Manufacturing industries and construction	282.2	225.9	529.2	23.9	1 061.2	-31%
Transport	0.0	2 944.4	56.1	-	3 000.6	19%
<i>of which: road</i>	-	2 614.9	6.5	-	2 621.4	22%
Other	10.5	441.8	860.1	8.7	1 321.1	-13%
<i>of which: residential</i>	6.9	185.1	520.6	-	712.5	-16%
<i>of which: services</i>	3.0	136.3	324.8	3.7	467.9	-4%
<i>Memo: international marine bunkers</i>	-	204.3	0.1	-	204.4	-10%
<i>Memo: international aviation bunkers</i>	-	251.8	-	-	251.8	90%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	2614.9	2146.2	20.6	20.6
Main activity prod. elec. and heat - coal	2184.9	2577.0	17.2	37.8
Main activity prod. elec. and heat - gas	966.5	304.3	7.6	45.4
Manufacturing industries - gas	529.2	483.1	4.2	49.6
Residential - gas	520.6	449.0	4.1	53.7
Non-specified other - gas	339.5	246.2	2.7	56.4
Other transport - oil	329.5	339.2	2.6	59.0
Manufacturing industries - coal	282.2	612.5	2.2	61.2
Other energy industry own use - gas	275.2	153.0	2.2	63.4
<i>Memo: total CO₂ from fuel combustion</i>	<i>9563.6</i>	<i>9654.2</i>	<i>75.3</i>	<i>75.3</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Annex II: North America

Figure 1. CO₂ emissions by fuel

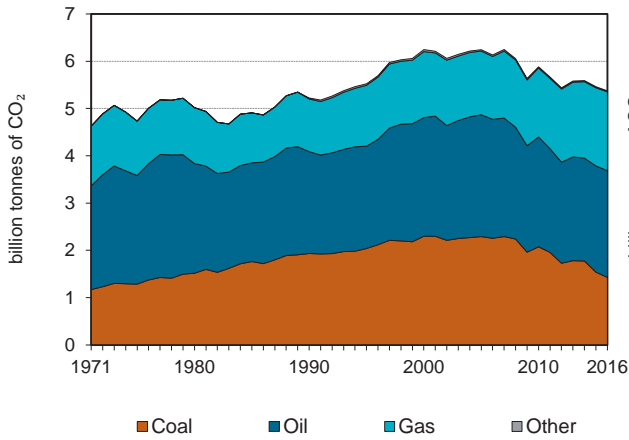


Figure 2. CO₂ emissions by sector

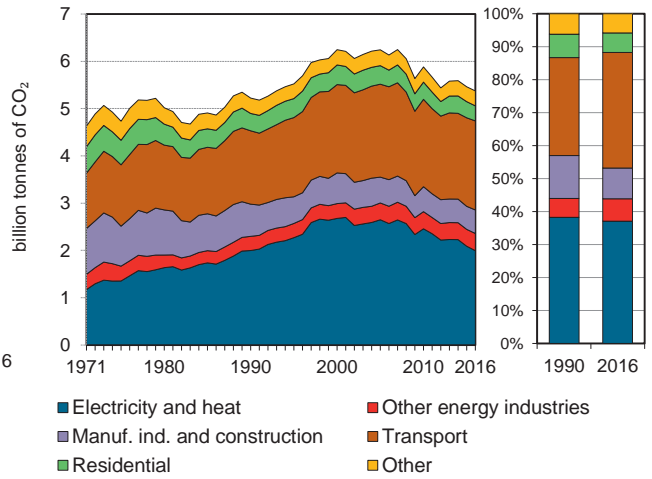


Figure 3. Electricity generation by fuel

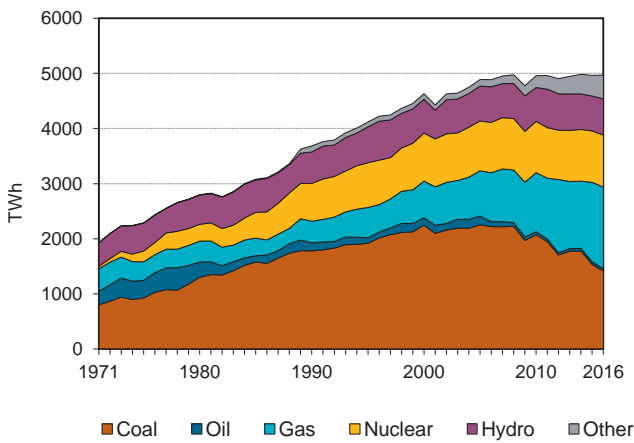


Figure 4. CO₂ from electricity generation: driving factors¹

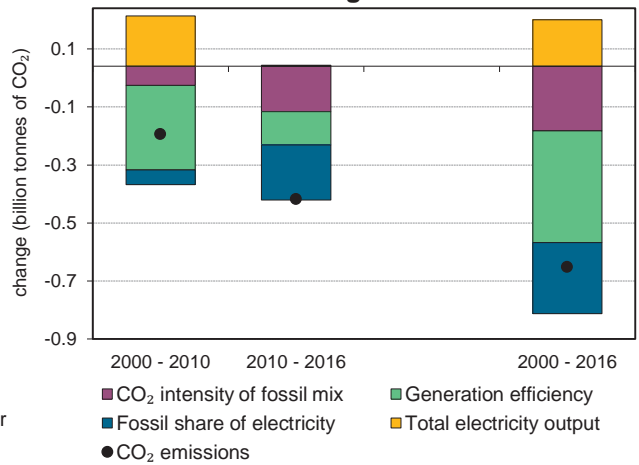


Figure 5. Changes in selected indicators

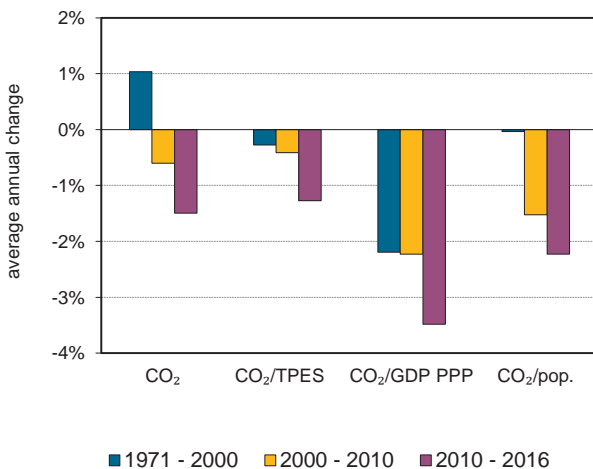
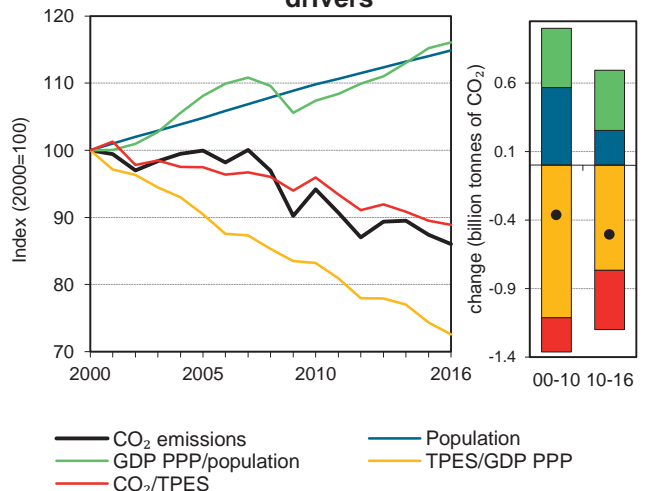


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Annex II: North America

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	5222.7	5 522.9	6 246.1	6 243.3	5 881.6	5 461.4	5 373.8	3%
Share of World CO ₂ from fuel combustion	25.5%	25.8%	26.9%	23.1%	19.3%	16.9%	16.6%	
TPES (PJ)	89024	96 345	105 815	108 519	103 830	103 349	102 440	15%
GDP (billion 2010 USD)	10078.5	11 401.8	14 055.8	15 932.6	16 577.8	18 475.2	18 748.3	86%
GDP PPP (billion 2010 USD)	9919.9	11 229.4	13 845.8	15 694.2	16 325.5	18 193.3	18 462.5	86%
Population (millions)	277.9	295.9	313.1	328.2	343.8	357.0	359.7	29%
CO ₂ / TPES (tCO ₂ per TJ)	58.7	57.3	59.0	57.5	56.6	52.8	52.5	-11%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.52	0.5	0.4	0.4	0.4	0.3	0.3	-45%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.53	0.5	0.5	0.4	0.4	0.3	0.3	-45%
CO ₂ / population (tCO ₂ per capita)	18.8	18.7	20.0	19.0	17.1	15.3	14.9	-21%
Share of electricity output from fossil fuels	63%	63%	66%	66%	65%	61%	59%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	541	544	573	537	488	415	395	-27%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	106	120	120	113	105	103	3%
Population index	100	106	113	118	124	128	129	29%
GDP PPP per population index	100	106	124	134	133	143	144	44%
Energy intensity index - TPES / GDP PPP	100	96	85	77	71	63	62	-38%
Carbon intensity index - CO ₂ / TPES	100	98	101	98	97	90	89	-11%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	1 427.5	2 258.5	1 666.8	21.2	5 373.8	3%
Electricity and heat generation	1 328.6	32.9	616.7	16.7	1 994.9	-0%
Other energy industry own use	6.9	152.6	204.6	-	364.1	21%
Manufacturing industries and construction	89.8	82.1	322.2	3.6	497.7	-27%
Transport	-	1 834.2	49.4	-	1 883.6	21%
<i>of which: road</i>	-	1 582.3	2.4	-	1 584.8	27%
Other	2.2	156.7	474.0	0.9	633.6	-8%
<i>of which: residential</i>	0.0	47.3	271.0	-	318.3	-13%
<i>of which: services</i>	2.1	51.0	197.5	0.9	251.5	0%
<i>Memo: international marine bunkers</i>	-	55.2	-	-	55.2	-42%
<i>Memo: international aviation bunkers</i>	-	75.6	-	-	75.6	80%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	1582.3	1245.9	22.4	22.4
Main activity prod. elec. and heat - coal	1319.0	1644.9	18.6	41.0
Main activity prod. elec. and heat - gas	569.7	156.4	8.1	49.1
Manufacturing industries - gas	322.2	297.8	4.6	53.6
Residential - gas	271.0	267.6	3.8	57.4
Other transport - oil	251.9	262.7	3.6	61.0
Other energy industry own use - gas	204.6	125.7	2.9	63.9
Non-specified other - gas	202.9	164.6	2.9	66.8
Other energy industry own use - oil	152.6	171.5	2.2	68.9
<i>Memo: total CO₂ from fuel combustion</i>	<i>5373.8</i>	<i>5222.7</i>	<i>75.9</i>	<i>75.9</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Annex II: Europe

Figure 1. CO₂ emissions by fuel

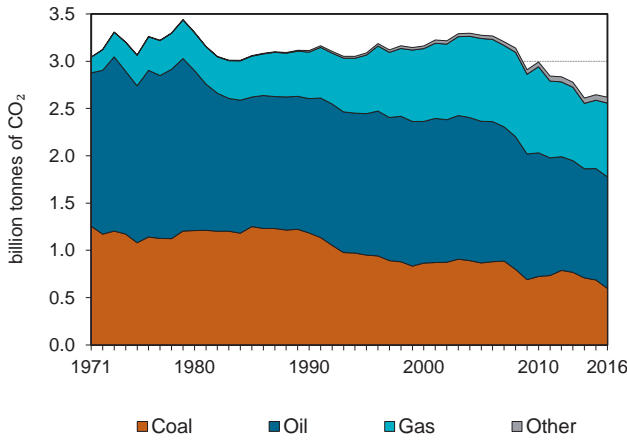


Figure 2. CO₂ emissions by sector

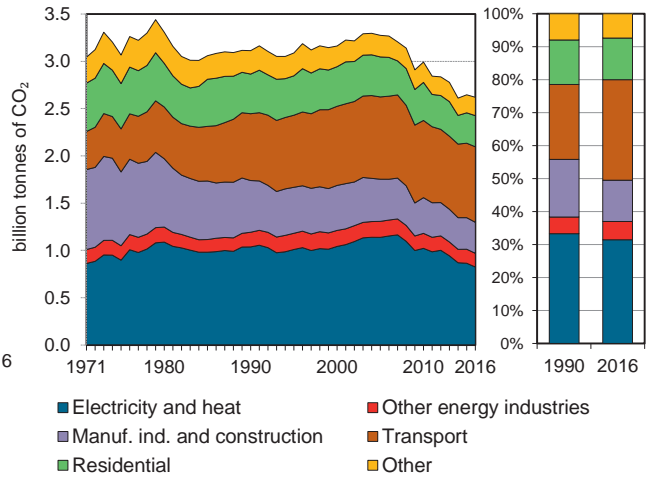


Figure 3. Electricity generation by fuel

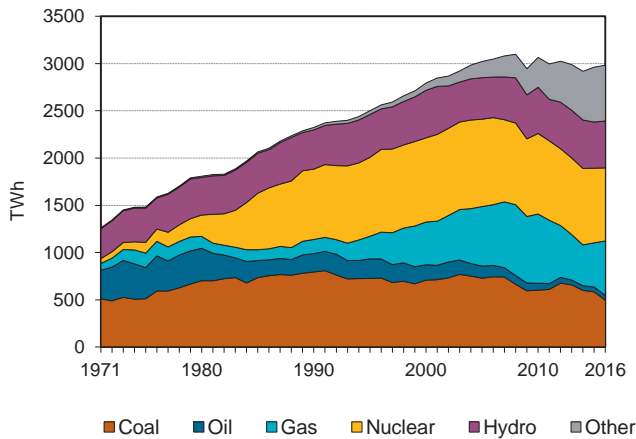


Figure 4. CO₂ from electricity generation: driving factors¹

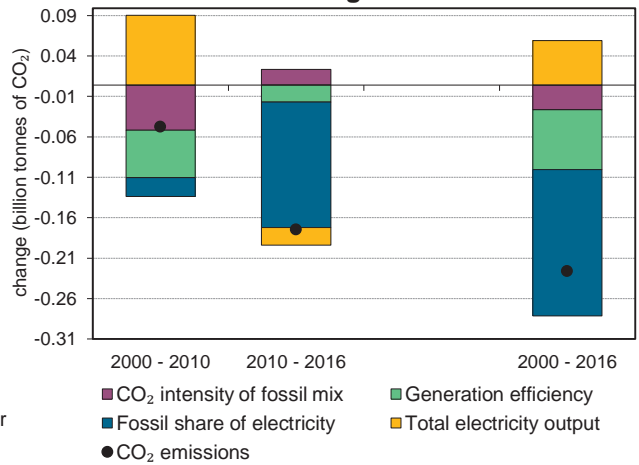


Figure 5. Changes in selected indicators

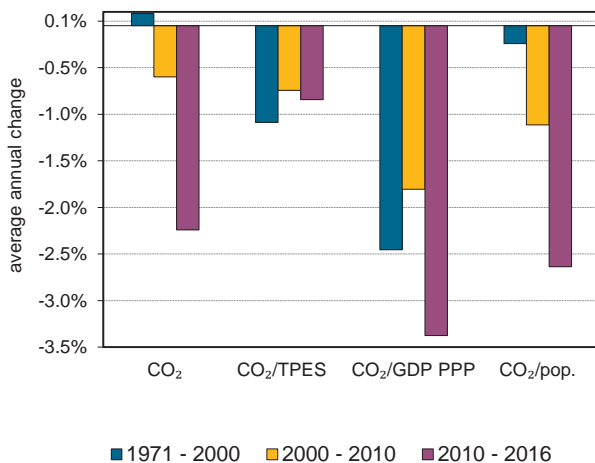
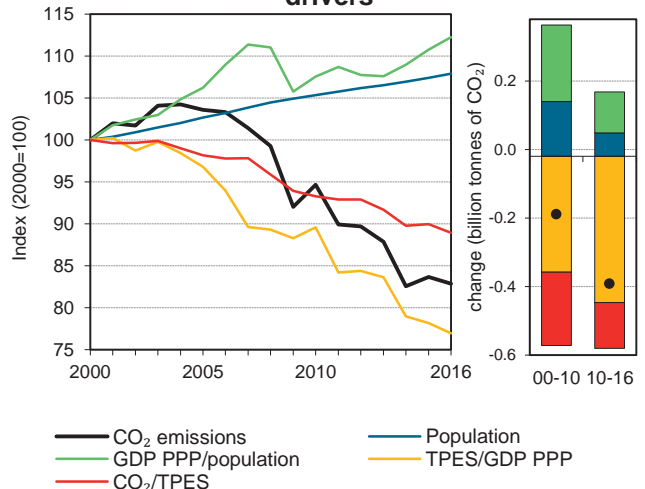


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Annex II: Europe

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	3113	3 088.4	3 161.9	3 274.9	2 992.6	2 646.0	2 619.8	-16%
Share of World CO ₂ from fuel combustion	15.2%	14.5%	13.6%	12.1%	9.8%	8.2%	8.1%	
TPES (PJ)	56515	58 987	62 324	65 770	63 245	57 973	58 076	3%
GDP (billion 2010 USD)	11746	12 732.4	14 703.9	16 031.9	16 670.8	17 564.2	17 884.0	52%
GDP PPP (billion 2010 USD)	10794.6	11 699.9	13 508.4	14 730.1	15 299.9	16 070.3	16 361.6	52%
Population (millions)	377.6	384.4	389.6	400.0	410.4	418.5	420.5	11%
CO ₂ / TPES (tCO ₂ per TJ)	55.1	52.4	50.7	49.8	47.3	45.6	45.1	-18%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.27	0.2	0.2	0.2	0.2	0.2	0.1	-45%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.29	0.3	0.2	0.2	0.2	0.2	0.2	-44%
CO ₂ / population (tCO ₂ per capita)	8.2	8.0	8.1	8.2	7.3	6.3	6.2	-24%
Share of electricity output from fossil fuels	49%	47%	48%	50%	47%	38%	39%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	416	376	342	338	295	259	244	-41%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	99	102	105	96	85	84	-16%
Population index	100	102	103	106	109	111	111	11%
GDP PPP per population index	100	106	121	129	130	134	136	36%
Energy intensity index - TPES / GDP PPP	100	96	88	85	79	69	68	-32%
Carbon intensity index - CO ₂ / TPES	100	95	92	90	86	83	82	-18%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	597.3	1 180.3	779.7	62.5	2 619.8	-16%
Electricity and heat generation	490.8	41.6	244.9	47.3	824.6	-20%
Other energy industry own use	25.3	76.5	42.9	0.5	145.2	-7%
Manufacturing industries and construction	73.4	79.7	161.0	13.8	327.9	-40%
Transport	0.0	792.8	5.9	-	798.8	13%
<i>of which: road</i>	-	752.6	3.8	-	756.3	15%
Other	7.7	189.7	325.0	1.0	523.4	-22%
<i>of which: residential</i>	6.8	102.1	220.2	-	329.1	-22%
<i>of which: services</i>	0.4	48.0	95.7	1.0	145.1	-13%
<i>Memo: international marine bunkers</i>	-	131.4	0.1	-	131.5	19%
<i>Memo: international aviation bunkers</i>	-	141.2	-	-	141.2	98%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	752.6	658.9	21.1	21.1
Main activity prod. elec. and heat - coal	445.0	713.1	12.5	33.5
Residential - gas	220.2	159.4	6.2	39.7
Main activity prod. elec. and heat - gas	196.0	60.2	5.5	45.2
Manufacturing industries - gas	161.0	157.5	4.5	49.7
Non-specified other - gas	104.8	74.7	2.9	52.6
Residential - oil	102.1	186.0	2.9	55.5
Non-specified other - oil	87.7	135.8	2.5	57.9
Manufacturing industries - oil	79.7	158.8	2.2	60.1
<i>Memo: total CO₂ from fuel combustion</i>	<i>2619.8</i>	<i>3113</i>	<i>73.3</i>	<i>73.3</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Annex II: Asia Oceania

Figure 1. CO₂ emissions by fuel

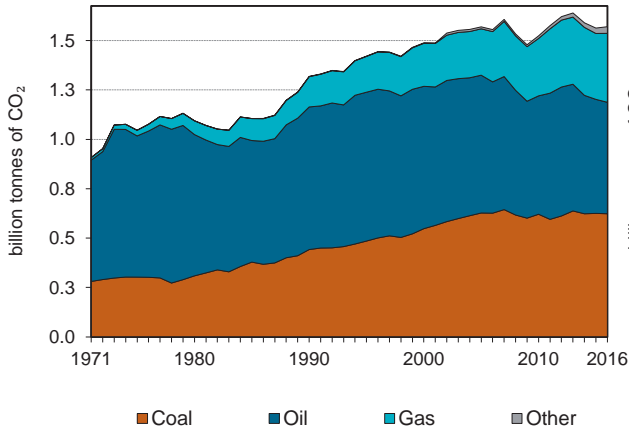


Figure 2. CO₂ emissions by sector

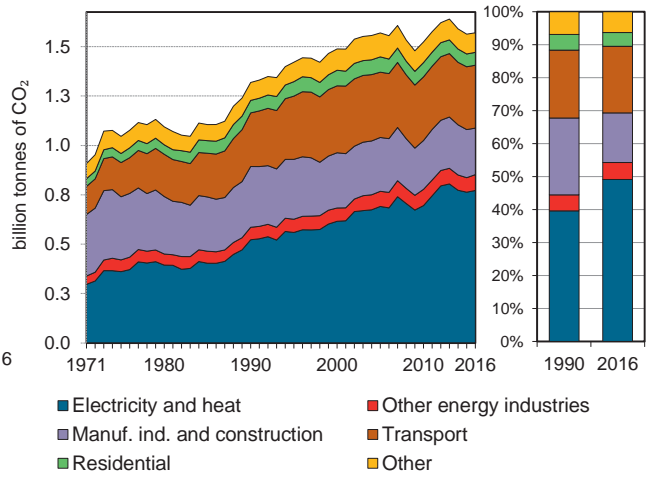


Figure 3. Electricity generation by fuel

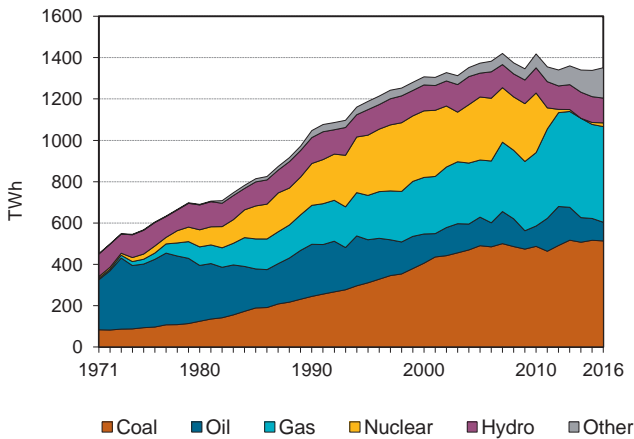


Figure 4. CO₂ from electricity generation: driving factors¹

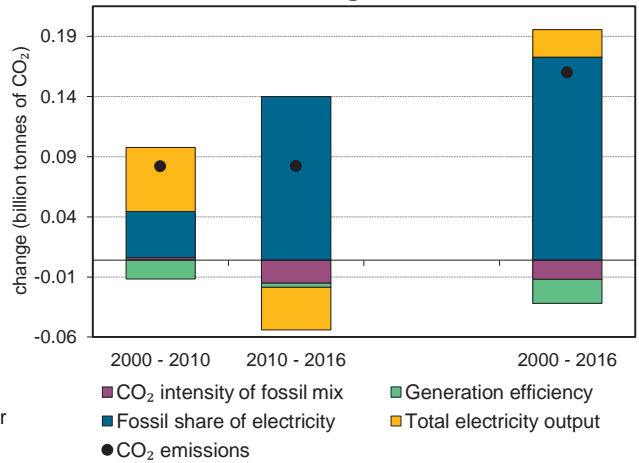


Figure 5. Changes in selected indicators

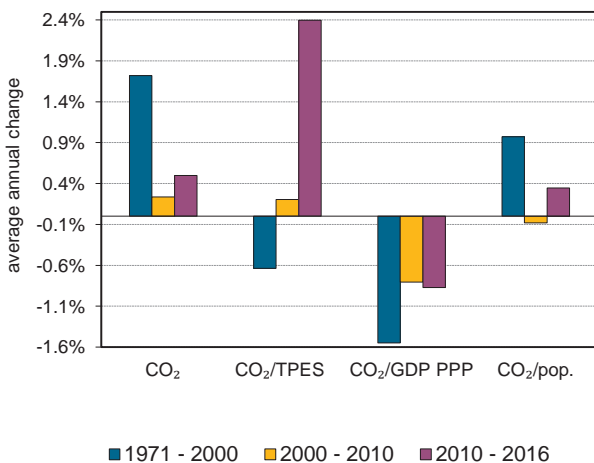
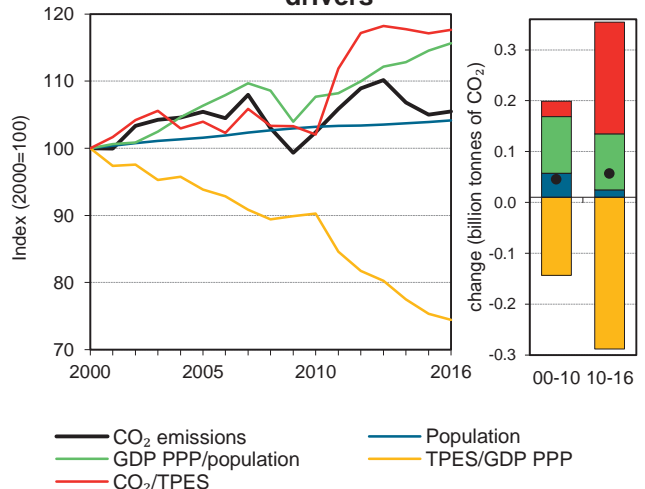


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Annex II: Asia Oceania

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	1318.6	1 421.2	1 488.3	1 569.3	1 523.6	1 563.1	1 569.9	19%
Share of World CO ₂ from fuel combustion	6.4%	6.7%	6.4%	5.8%	5.0%	4.8%	4.9%	
TPES (PJ)	22491	25 158	26 910	27 298	26 994	24 127	24 132	7%
GDP (billion 2010 USD)	5461.5	5 951.7	6 418.1	6 939.9	7 143.9	7 659.8	7 751.2	42%
GDP PPP (billion 2010 USD)	4265.9	4 646.3	5 005.2	5 408.5	5 560.5	5 957.7	6 028.6	41%
Population (millions)	144.3	147.4	150.0	152.4	154.7	155.9	156.2	8%
CO ₂ / TPES (tCO ₂ per TJ)	58.6	56.5	55.3	57.5	56.4	64.8	65.1	11%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.24	0.2	0.2	0.2	0.2	0.2	0.2	-16%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.31	0.3	0.3	0.3	0.3	0.3	0.3	-16%
CO ₂ / population (tCO ₂ per capita)	9.1	9.6	9.9	10.3	9.8	10.0	10.1	10%
Share of electricity output from fossil fuels	66%	62%	63%	66%	67%	82%	80%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	498	470	470	502	490	570	571	15%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	108	113	119	116	119	119	19%
Population index	100	102	104	106	107	108	108	8%
GDP PPP per population index	100	107	113	120	122	129	131	31%
Energy intensity index - TPES / GDP PPP	100	103	102	96	92	77	76	-24%
Carbon intensity index - CO ₂ / TPES	100	96	94	98	96	111	111	11%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	623.4	564.1	349.1	33.4	1 569.9	19%
Electricity and heat generation	479.9	58.6	213.4	20.0	771.9	48%
Other energy industry own use	23.9	28.5	27.8	-	80.2	27%
Manufacturing industries and construction	118.9	64.1	46.0	6.6	235.6	-23%
Transport	0.0	317.4	0.8	-	318.2	17%
<i>of which: road</i>	-	280.0	0.4	-	280.4	16%
Other	0.6	95.4	61.1	6.9	164.0	7%
<i>of which: residential</i>	0.0	35.8	29.3	-	65.1	3%
<i>of which: services</i>	0.5	37.3	31.6	1.8	71.2	6%
<i>Memo: international marine bunkers</i>	-	17.7	-	-	17.7	-16%
<i>Memo: international aviation bunkers</i>	-	34.9	-	-	34.9	83%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	420.9	219.0	20.5	20.5
Road - oil	280.0	241.4	13.7	34.2
Main activity prod. elec. and heat - gas	200.9	87.6	9.8	44.0
Manufacturing industries - coal	118.9	155.3	5.8	49.8
Manufacturing industries - oil	64.1	123.3	3.1	52.9
Non-specified other - oil	59.6	83.0	2.9	55.8
Unallocated autoproducers - coal	59.0	42.3	2.9	58.7
Manufacturing industries - gas	46.0	27.9	2.2	60.9
Main activity prod. elec. and heat - oil	41.4	138.8	2.0	62.9
<i>Memo: total CO₂ from fuel combustion</i>	<i>1569.9</i>	<i>1318.6</i>	<i>76.5</i>	<i>76.5</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Annex I: Economies in Transition

Figure 1. CO₂ emissions by fuel

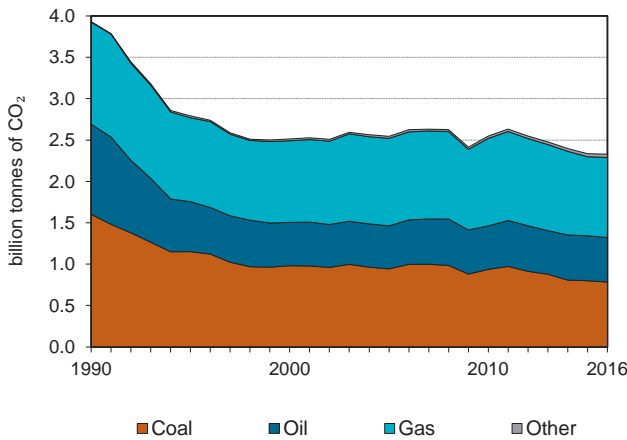


Figure 2. CO₂ emissions by sector

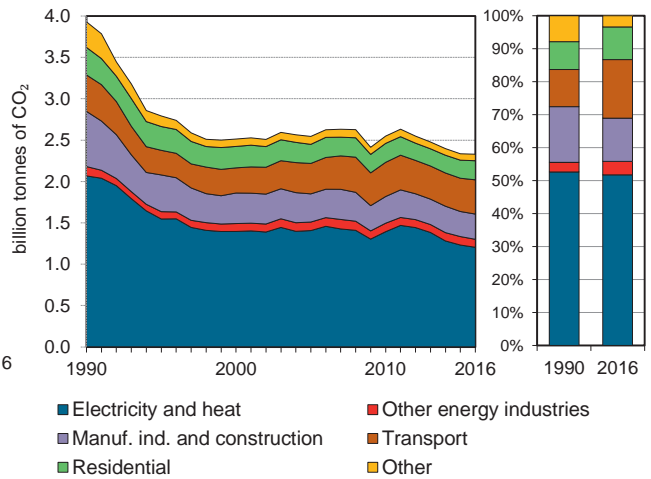


Figure 3. Electricity generation by fuel

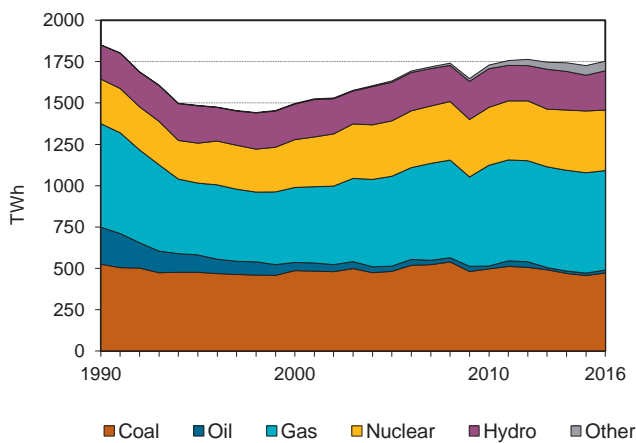


Figure 4. CO₂ from electricity generation: driving factors¹

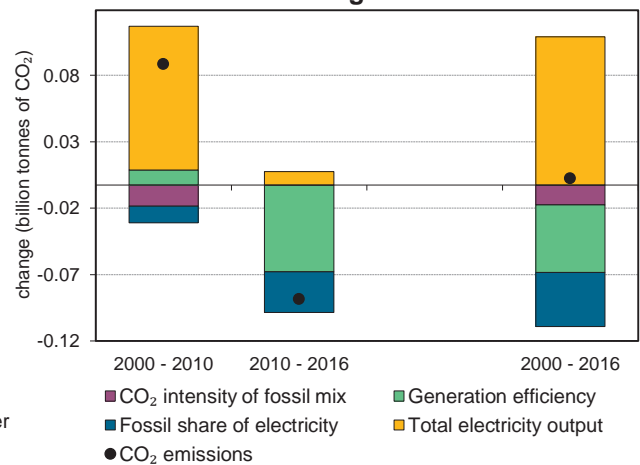


Figure 5. Changes in selected indicators

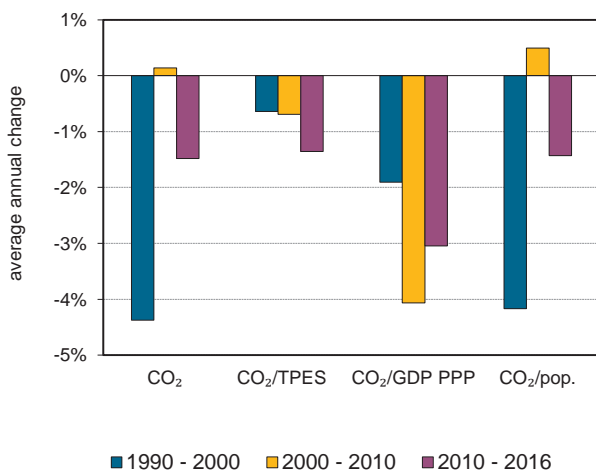
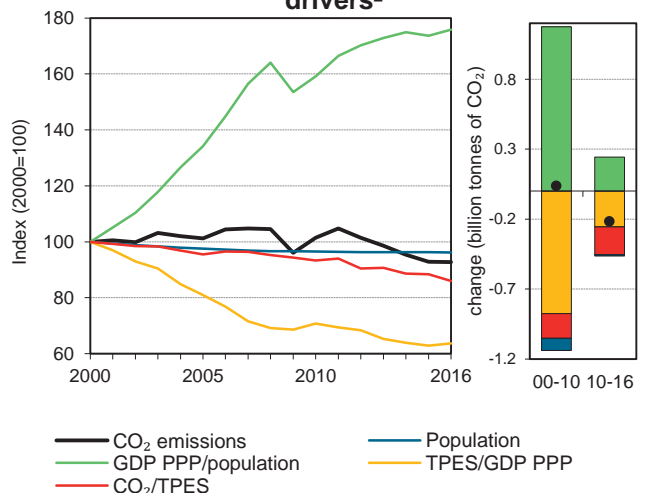


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Annex I: Economies in Transition

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	3930.2	2 792.4	2 513.3	2 545.0	2 548.6	2 335.2	2 329.9	-41%
Share of World CO ₂ from fuel combustion	19.2%	13.1%	10.8%	9.4%	8.4%	7.2%	7.2%	
TPES (PJ)	63604	46 567	43 376	45 976	47 133	45 588	46 764	-26%
GDP (billion 2010 USD)	2459.1	1 783.6	1 990.9	2 588.5	3 032.1	3 288.1	3 330.9	35%
GDP PPP (billion 2010 USD)	4704.1	3 295.4	3 646.8	4 775.4	5 601.7	6 099.0	6 171.4	31%
Population (millions)	321.1	319.7	314.2	306.5	303.3	302.5	302.3	-6%
CO ₂ / TPES (tCO ₂ per TJ)	61.8	60.0	57.9	55.4	54.1	51.2	49.8	-19%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.6	1.6	1.3	1.0	0.8	0.7	0.7	-56%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.84	0.8	0.7	0.5	0.5	0.4	0.4	-55%
CO ₂ / population (tCO ₂ per capita)	12.2	8.7	8.0	8.3	8.4	7.7	7.7	-37%
Share of electricity output from fossil fuels	74%	69%	66%	65%	65%	63%	63%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	535	492	472	482	460	428	404	-24%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	71	64	65	65	59	59	-41%
Population index	100	100	98	95	94	94	94	-6%
GDP PPP per population index	100	70	79	106	126	138	139	39%
Energy intensity index - TPES / GDP PPP	100	105	88	71	62	55	56	-44%
Carbon intensity index - CO ₂ / TPES	100	97	94	90	88	83	81	-19%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	784.1	537.5	967.8	40.5	2 329.9	-41%
Electricity and heat generation	601.3	35.1	544.2	24.6	1 205.2	-42%
Other energy industry own use	15.7	45.0	34.8	0.9	96.3	-15%
Manufacturing industries and construction	113.4	56.8	121.1	13.6	305.0	-54%
Transport	0.1	337.9	75.9	-	413.8	-6%
<i>of which: road</i>	-	309.1	0.9	-	310.0	11%
Other	53.6	62.7	191.8	1.3	309.4	-52%
<i>of which: residential</i>	40.4	24.9	165.7	-	231.0	-31%
<i>of which: services</i>	8.9	9.5	21.5	1.0	40.8	-73%
<i>Memo: international marine bunkers</i>	-	37.2	-	-	37.2	277%
<i>Memo: international aviation bunkers</i>	-	21.7	-	-	21.7	-42%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	513.7	807.8	14.6	14.6
Main activity prod. elec. and heat - gas	373.6	504.8	10.6	25.2
Road - oil	309.1	276.6	8.8	33.9
Unallocated autoproducers - gas	170.5	222.0	4.8	38.8
Residential - gas	165.7	155.0	4.7	43.5
Manufacturing industries - gas	121.1	201.2	3.4	46.9
Manufacturing industries - coal	113.4	313.1	3.2	50.1
Unallocated autoproducers - coal	87.6	169.6	2.5	52.6
Other transport - gas	75.0	77.7	2.1	54.7
<i>Memo: total CO₂ from fuel combustion</i>	<i>2329.9</i>	<i>3930.2</i>	<i>66.1</i>	<i>66.1</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Non-Annex I Parties

Figure 1. CO₂ emissions by fuel

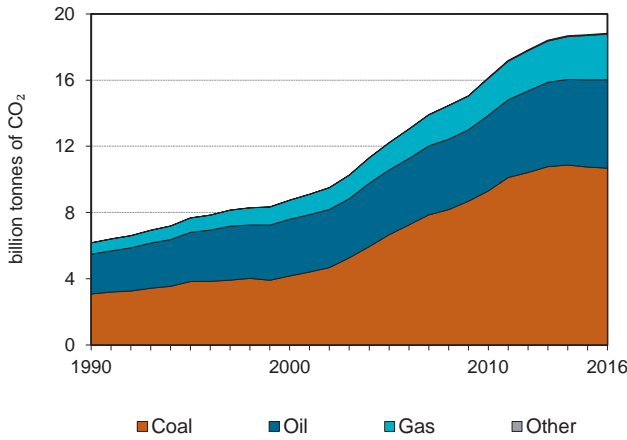


Figure 2. CO₂ emissions by sector

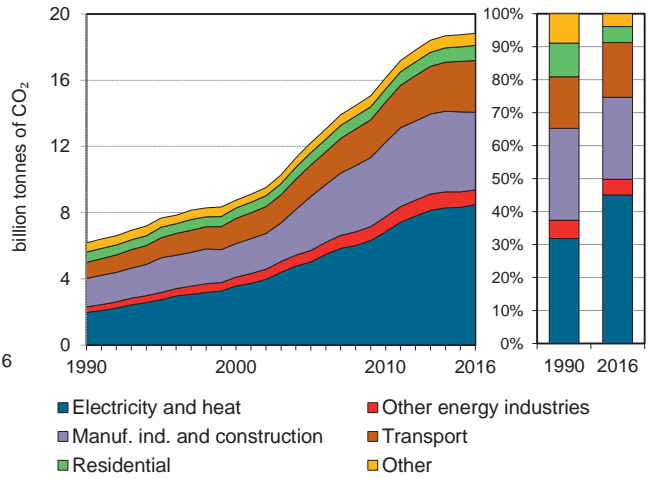


Figure 3. Electricity generation by fuel

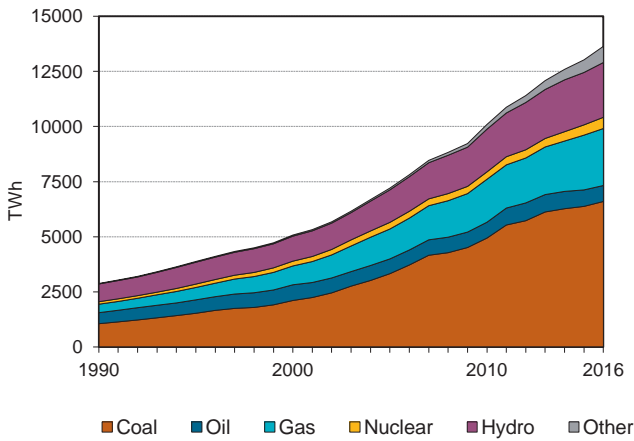


Figure 4. CO₂ from electricity generation: driving factors¹

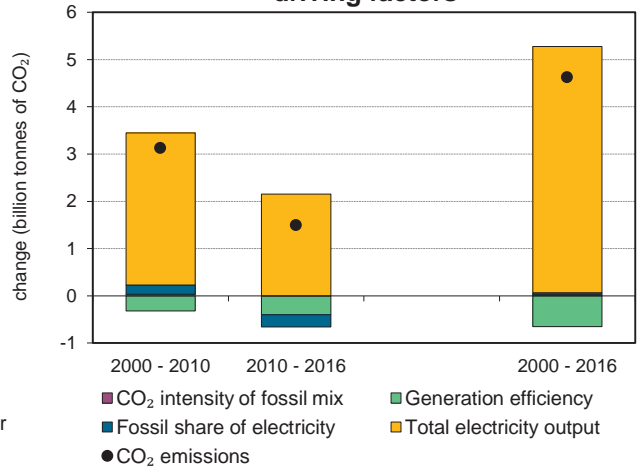


Figure 5. Changes in selected indicators

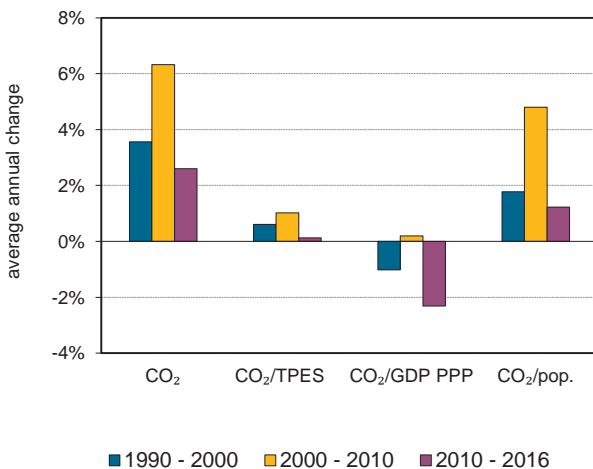
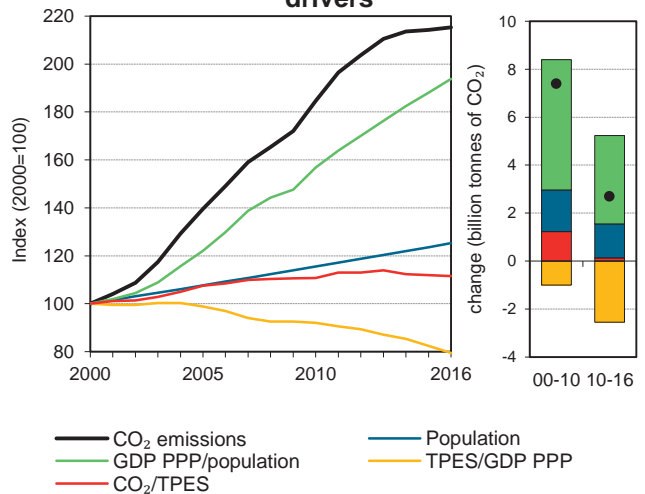


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Non-Annex I Parties

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	6168.3	7 674.7	8 749.9	12 217.5	16 145.6	18 750.0	18 834.3	205%
Share of World CO ₂ from fuel combustion	30.1%	35.9%	37.7%	45.1%	53.0%	58.1%	58.3%	
TPES (PJ)	124995	146 910	166 971	216 713	278 324	319 814	322 230	158%
GDP (billion 2010 USD)	7817.6	9 868.9	12 262.5	15 902.9	21 713.1	27 487.1	28 489.9	264%
GDP PPP (billion 2010 USD)	15798.4	19 881.1	24 850.2	32 644.2	45 020.5	57 747.0	60 328.7	282%
Population (millions)	4103.2	4 496.9	4 878.8	5 252.2	5 634.8	6 030.8	6 111.1	49%
CO ₂ / TPES (tCO ₂ per TJ)	49.4	52.2	52.4	56.4	58.0	58.6	58.5	18%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.79	0.8	0.7	0.8	0.7	0.7	0.7	-16%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.39	0.4	0.4	0.4	0.4	0.3	0.3	-20%
CO ₂ / population (tCO ₂ per capita)	1.5	1.7	1.8	2.3	2.9	3.1	3.1	105%
Share of electricity output from fossil fuels	68%	70%	72%	74%	76%	74%	73%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	625	658	650	651	636	598	581	-7%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	124	142	198	262	304	305	205%
Population index	100	110	119	128	137	147	149	49%
GDP PPP per population index	100	115	132	161	208	249	256	156%
Energy intensity index - TPES / GDP PPP	100	93	85	84	78	70	68	-32%
Carbon intensity index - CO ₂ / TPES	100	106	106	114	118	119	118	18%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	10 681.4	5 344.6	2 754.2	54.1	18 834.3	205%
Electricity and heat generation	6 545.5	616.4	1 281.3	38.9	8 482.1	332%
Other energy industry own use	228.1	292.1	370.4	x	890.6	162%
Manufacturing industries and construction	3 390.7	694.5	592.7	13.5	4 691.4	173%
Transport	0.2	3 023.4	106.4	x	3 130.0	224%
<i>of which: road</i>	x	2 754.7	91.0	x	2 845.7	235%
Other	517.0	718.1	403.4	1.7	1 640.3	39%
<i>of which: residential</i>	230.9	373.3	304.2	x	908.4	45%
<i>of which: services</i>	107.7	108.0	88.0	1.7	305.4	124%
<i>Memo: international marine bunkers</i>	x	431.4	x	x	431.4	220%
<i>Memo: international aviation bunkers</i>	x	272.8	x	x	272.8	211%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	5961.7	1211.5	18.5	18.5
Manufacturing industries - coal	3390.7	1113.7	10.5	29.0
Road - oil	2754.7	849.3	8.5	37.5
Main activity prod. elec. and heat - gas	1093.2	221.0	3.4	40.9
Manufacturing industries - oil	694.5	436.6	2.2	43.1
Manufacturing industries - gas	592.7	165.6	1.8	44.9
Unallocated autoproducers - coal	583.8	60.3	1.8	46.7
Main activity prod. elec. and heat - oil	511.1	402.9	1.6	48.3
Residential - oil	373.3	205.7	1.2	49.5
<i>Memo: total CO₂ from fuel combustion</i>	<i>18834.3</i>	<i>6168.3</i>	<i>58.4</i>	<i>58.4</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Annex B Kyoto Parties

Figure 1. CO₂ emissions by fuel

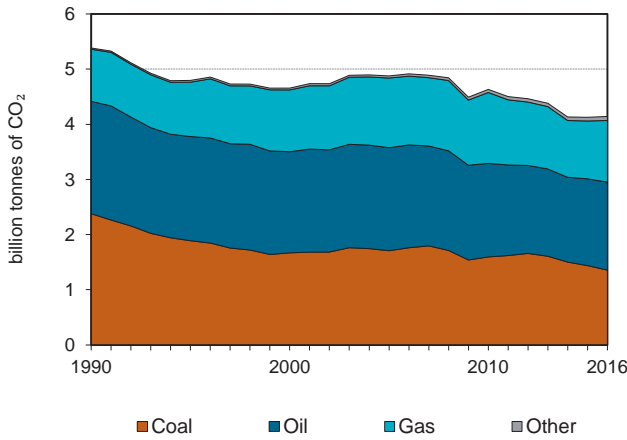


Figure 2. CO₂ emissions by sector

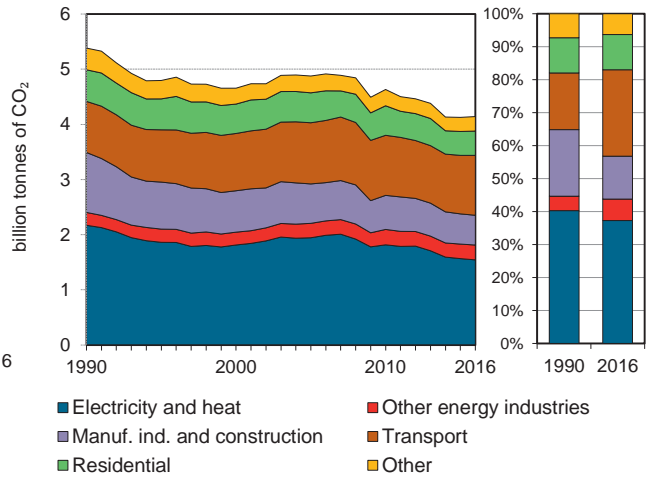


Figure 3. Electricity generation by fuel

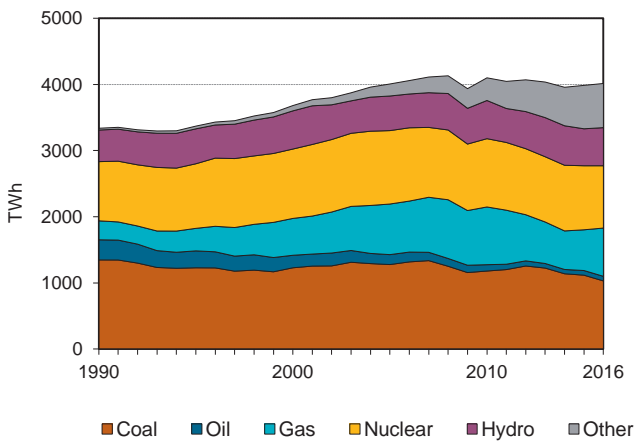


Figure 4. CO₂ from electricity generation: driving factors¹

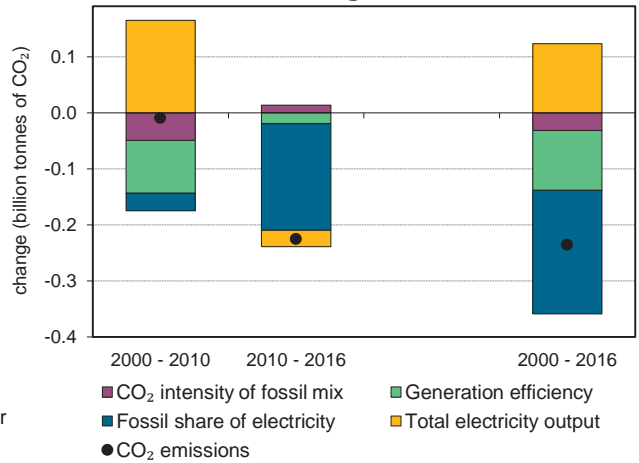


Figure 5. Changes in selected indicators

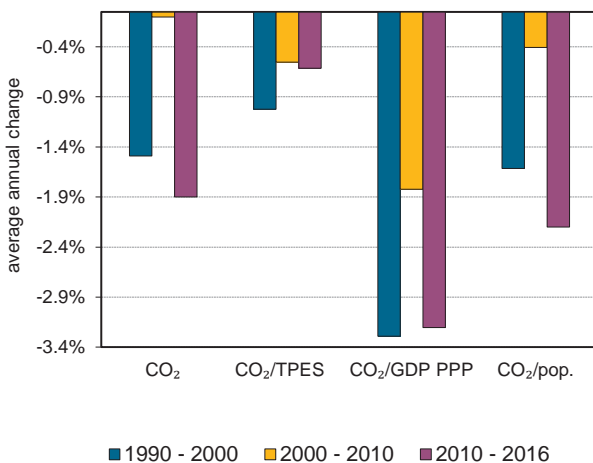
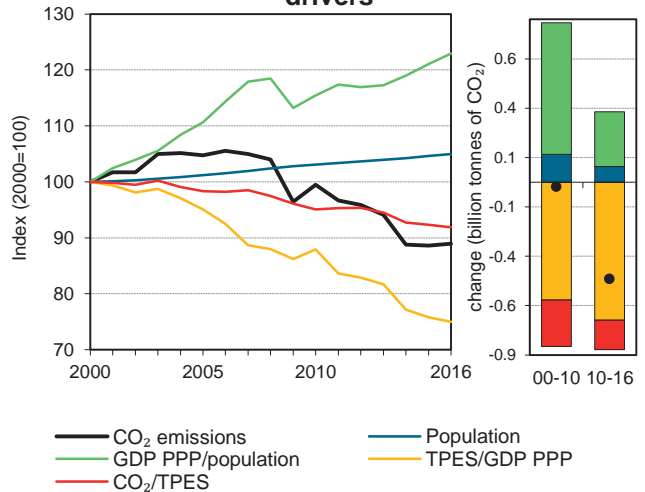


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Annex B Kyoto Parties

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	5382.7	4 795.8	4 656.0	4 876.5	4 632.0	4 126.7	4 141.0	-23%
Share of World CO ₂ from fuel combustion	26.2%	22.4%	20.1%	18.0%	15.2%	12.8%	12.8%	
TPES (PJ)	90071	85 056	85 906	91 469	89 892	82 455	83 143	-8%
GDP (billion 2010 USD)	13579.2	14 509.4	16 793.5	18 610.7	19 657.6	20 934.5	21 333.1	57%
GDP PPP (billion 2010 USD)	13502	14 036.1	16 198.2	18 139.4	19 276.1	20 513.8	20 911.9	55%
Population (millions)	585	590.8	592.5	599.7	610.8	619.8	622.0	6%
CO ₂ / TPES (tCO ₂ per TJ)	59.8	56.4	54.2	53.3	51.5	50.0	49.8	-17%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.4	0.3	0.3	0.3	0.2	0.2	0.2	-51%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.4	0.3	0.3	0.3	0.2	0.2	0.2	-50%
CO ₂ / population (tCO ₂ per capita)	9.2	8.1	7.9	8.1	7.6	6.7	6.7	-28%
Share of electricity output from fossil fuels	58%	54%	54%	55%	53%	46%	46%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	509	458	417	408	370	332	323	-36%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	89	86	91	86	77	77	-23%
Population index	100	101	101	103	104	106	106	6%
GDP PPP per population index	100	103	118	131	137	143	146	46%
Energy intensity index - TPES / GDP PPP	100	91	80	76	70	60	60	-40%
Carbon intensity index - CO ₂ / TPES	100	94	91	89	86	84	83	-17%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	1 356.0	1 595.1	1 117.4	72.5	4 141.0	-23%
Electricity and heat generation	1 074.7	61.0	358.1	49.2	1 542.9	-29%
Other energy industry own use	42.9	109.0	116.6	0.5	269.0	15%
Manufacturing industries and construction	183.5	117.3	217.5	21.6	539.8	-50%
Transport	0.1	1 073.0	13.1	-	1 086.1	17%
<i>of which: road</i>	-	1 013.1	4.5	-	1 017.6	19%
Other	54.8	234.9	412.2	1.3	703.2	-27%
<i>of which: residential</i>	43.3	113.2	284.4	-	440.9	-23%
<i>of which: services</i>	6.6	55.5	116.9	1.2	180.2	-17%
<i>Memo: international marine bunkers</i>	-	144.2	0.1	-	144.3	23%
<i>Memo: international aviation bunkers</i>	-	162.7	-	-	162.7	81%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	1013.1	852.9	17.2	17.2
Main activity prod. elec. and heat - coal	1011.1	1377.6	17.1	34.3
Main activity prod. elec. and heat - gas	289.1	226.7	4.9	39.2
Residential - gas	284.4	208.1	4.8	44.0
Manufacturing industries - gas	217.5	300.2	3.7	47.7
Manufacturing industries - coal	183.5	520.4	3.1	50.8
Non-specified other - gas	127.8	110.6	2.2	53.0
Non-specified other - oil	121.7	202.2	2.1	55.0
Manufacturing industries - oil	117.3	259.5	2.0	57.0
<i>Memo: total CO₂ from fuel combustion</i>	<i>4141.0</i>	<i>5382.7</i>	<i>70.2</i>	<i>70.2</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

CO₂ EMISSIONS STATISTICS AND INDICATORS

OTHER REGIONAL TOTALS

IEA and Accession/Association countries

Figure 1. CO₂ emissions by fuel

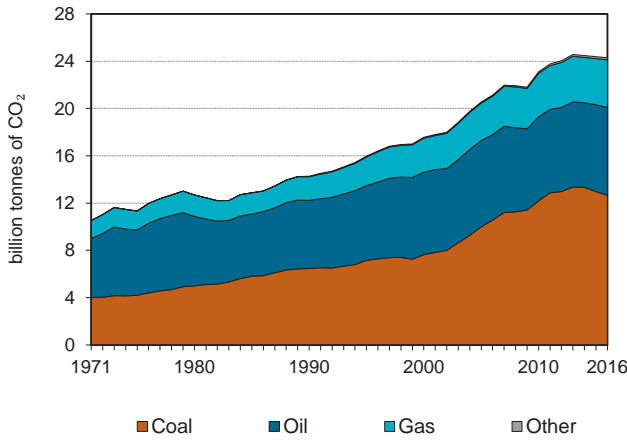


Figure 2. CO₂ emissions by sector

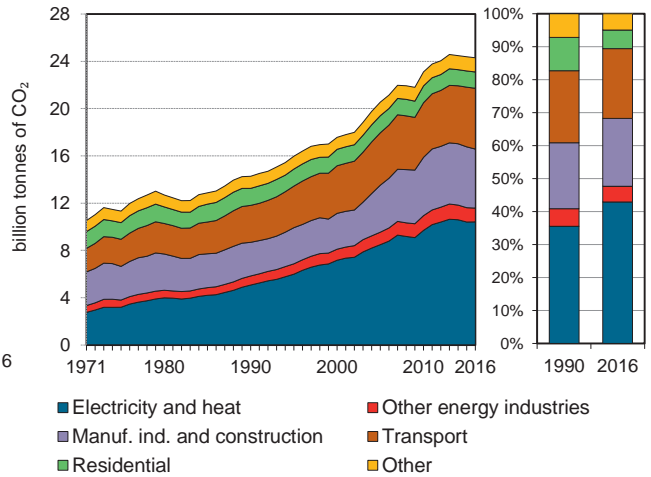


Figure 3. Electricity generation by fuel

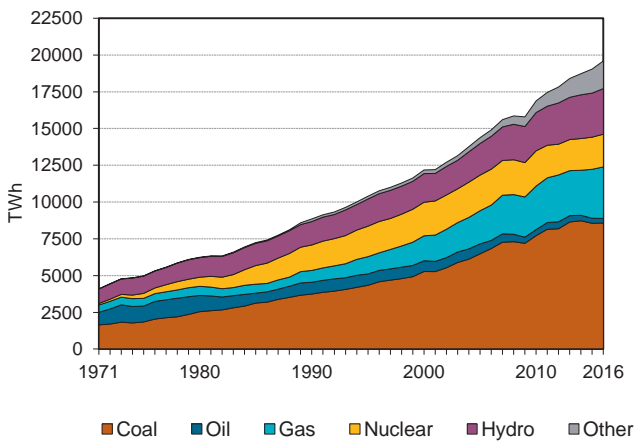


Figure 4. CO₂ from electricity generation: driving factors¹

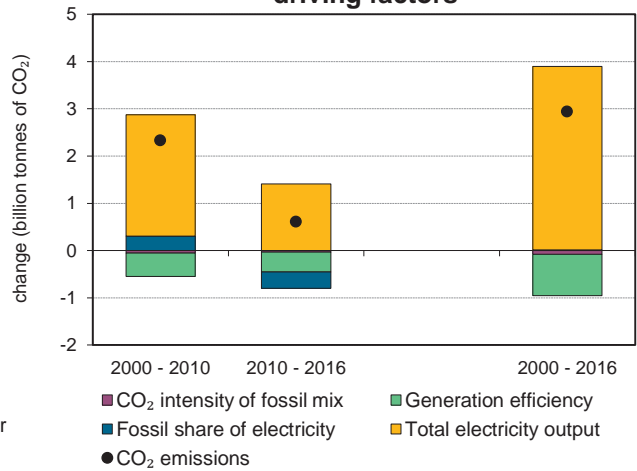


Figure 5. Changes in selected indicators

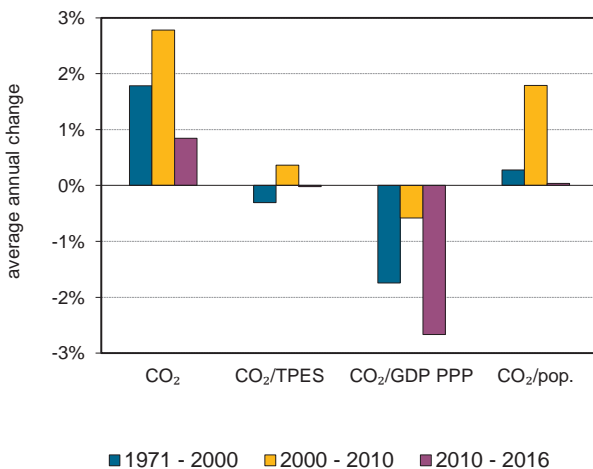
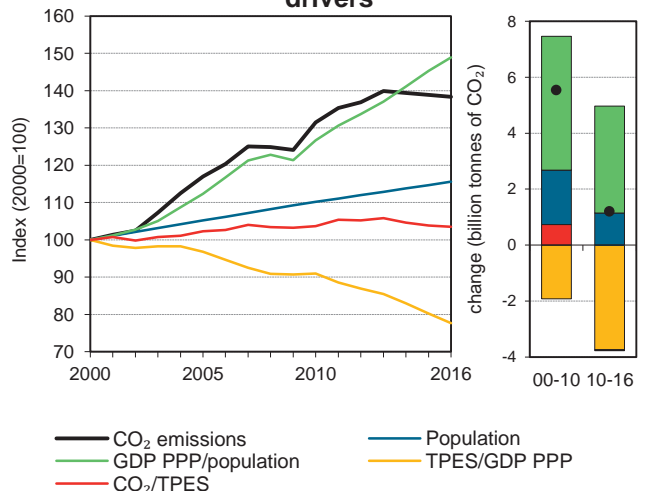


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

IEA and Accession/Association countries

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	14272.7	15 970.6	17 567.1	20 546.4	23 103.5	24 387.5	24 301.1	70%
Share of World CO ₂ from fuel combustion	69.6%	74.7%	75.6%	75.9%	75.8%	75.6%	75.2%	
TPES (PJ)	255762	284 038	311 508	356 331	395 173	416 332	416 214	63%
GDP (billion 2010 USD)	32959.5	37 378.9	44 469.8	50 933.2	56 898.5	65 125.6	66 728.9	102%
GDP PPP (billion 2010 USD)	35245.4	41 035.3	49 648.3	58 671.9	69 271.4	82 719.4	85 438.9	142%
Population (millions)	3571.1	3 816.1	4 044.8	4 254.5	4 455.3	4 638.5	4 675.2	31%
CO ₂ / TPES (tCO ₂ per TJ)	55.8	56.2	56.4	57.7	58.5	58.6	58.4	5%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.43	0.4	0.4	0.4	0.4	0.4	0.4	-16%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.41	0.4	0.4	0.4	0.3	0.3	0.3	-30%
CO ₂ / population (tCO ₂ per capita)	4	4.2	4.3	4.8	5.2	5.3	5.2	30%
Share of electricity output from fossil fuels	61%	61%	64%	66%	66%	65%	64%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	535	538	547	548	532	504	489	-9%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	112	123	144	162	171	170	70%
Population index	100	107	113	119	125	130	131	31%
GDP PPP per population index	100	109	124	140	158	181	185	85%
Energy intensity index - TPES / GDP PPP	100	95	86	84	79	69	67	-33%
Carbon intensity index - CO ₂ / TPES	100	101	101	103	105	105	105	5%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	12 659.7	7 430.7	4 034.0	176.6	24 301.1	70%
Electricity and heat generation	8 419.8	283.4	1 589.8	122.0	10 415.0	105%
Other energy industry own use	248.3	479.4	439.8	0.5	1 168.0	52%
Manufacturing industries and construction	3 453.5	676.7	819.0	43.5	4 992.7	75%
Transport	0.1	5 025.8	119.4	-	5 145.3	65%
<i>of which: road</i>	-	4 473.9	64.0	-	4 537.9	71%
Other	537.9	965.4	1 066.0	10.6	2 580.0	5%
<i>of which: residential</i>	250.8	459.5	667.8	-	1 378.2	-4%
<i>of which: services</i>	116.7	215.4	381.9	5.6	719.6	18%
<i>Memo: international marine bunkers</i>	-	452.1	0.1	-	452.2	62%
<i>Memo: international aviation bunkers</i>	-	392.6	-	-	392.6	136%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	7752.6	3676.1	22.0	22.0
Road - oil	4473.9	2649.7	12.7	34.6
Manufacturing industries - coal	3453.5	1563.0	9.8	44.4
Main activity prod. elec. and heat - gas	1396.1	357.9	4.0	48.4
Manufacturing industries - gas	819.0	573.3	2.3	50.7
Manufacturing industries - oil	676.7	701.3	1.9	52.6
Residential - gas	667.8	474.0	1.9	54.5
Unallocated autoproducers - coal	667.3	266.9	1.9	56.4
Other transport - oil	551.8	397.4	1.6	58.0
<i>Memo: total CO₂ from fuel combustion</i>	<i>24301.1</i>	<i>14272.7</i>	<i>68.8</i>	<i>68.8</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

OECD Total

Figure 1. CO₂ emissions by fuel

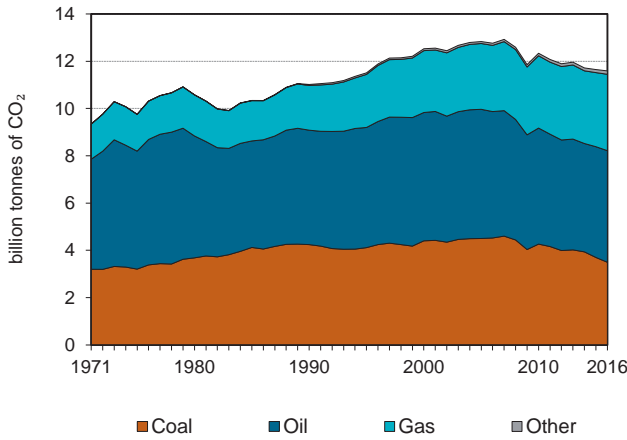


Figure 2. CO₂ emissions by sector

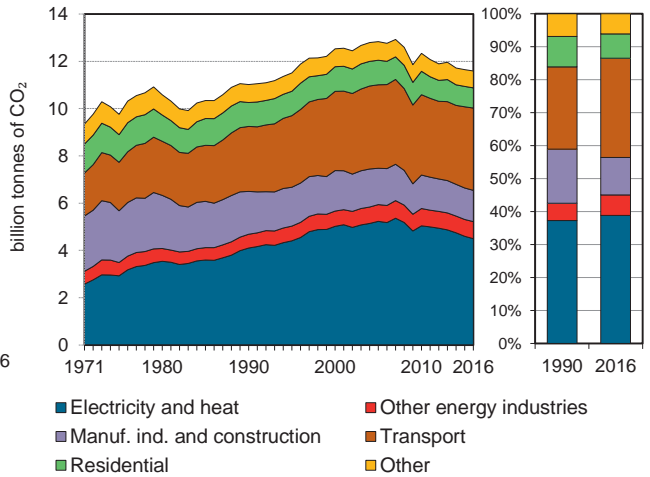


Figure 3. Electricity generation by fuel

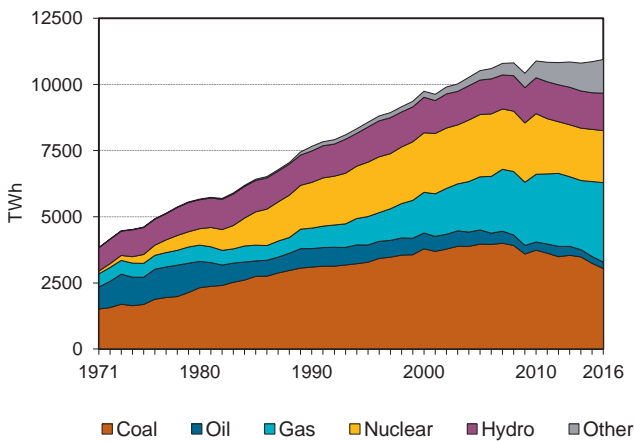


Figure 4. CO₂ from electricity generation: driving factors¹

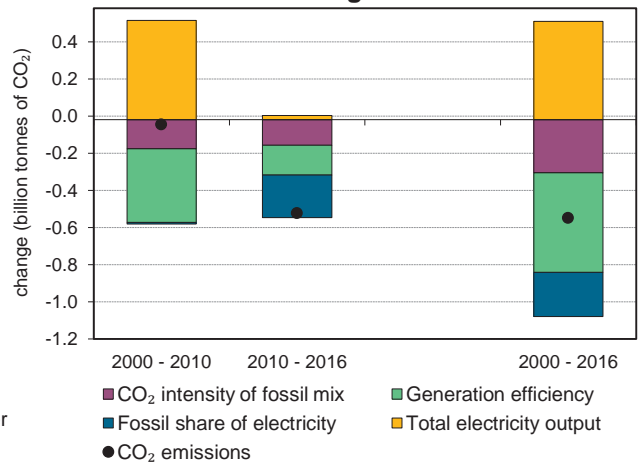


Figure 5. Changes in selected indicators

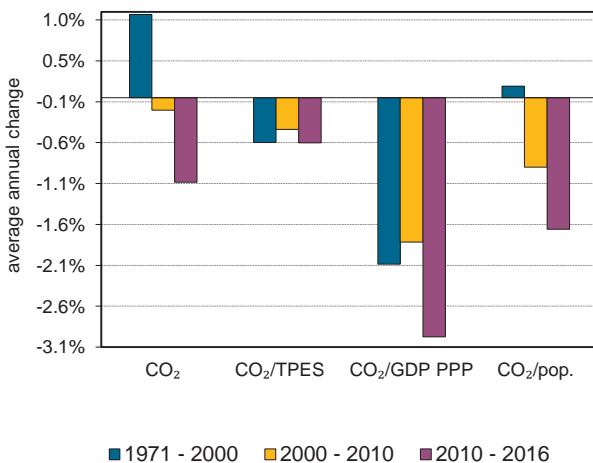
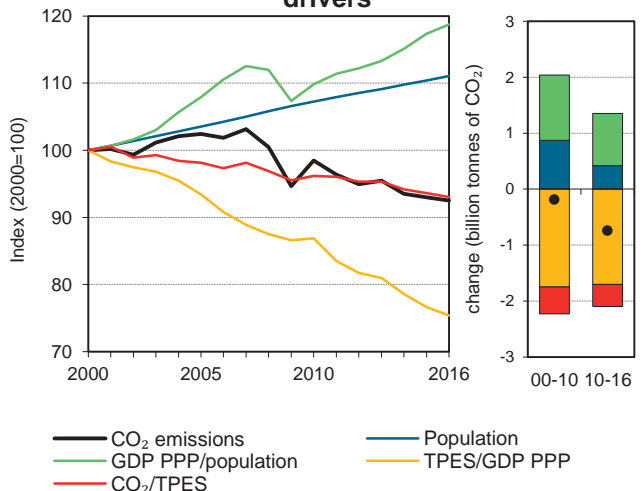


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

OECD Total

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	11016.7	11 509.9	12 529.1	12 833.0	12 338.0	11 648.7	11 591.4	5%
Share of World CO ₂ from fuel combustion	53.7%	53.8%	54.0%	47.4%	40.5%	36.1%	35.9%	
TPES (PJ)	189791	204 439	222 115	231 857	227 388	220 594	220 844	16%
GDP (billion 2010 USD)	29399.3	32 593.7	38 347.6	42 665.8	44 767.4	48 949.3	49 786.9	69%
GDP PPP (billion 2010 USD)	28256.1	31 384.0	37 170.9	41 532.2	43 793.4	48 171.4	49 034.1	74%
Population (millions)	1073	1 117.2	1 156.5	1 197.2	1 240.4	1 276.9	1 284.5	20%
CO ₂ / TPES (tCO ₂ per TJ)	58.1	56.3	56.4	55.3	54.3	52.8	52.5	-10%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.38	0.4	0.3	0.3	0.3	0.2	0.2	-38%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.39	0.4	0.3	0.3	0.3	0.2	0.2	-39%
CO ₂ / population (tCO ₂ per capita)	10.3	10.3	10.8	10.7	9.9	9.1	9.0	-12%
Share of electricity output from fossil fuels	60%	59%	61%	62%	61%	59%	58%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	508	492	496	476	441	405	392	-23%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	104	114	116	112	106	105	5%
Population index	100	104	108	112	116	119	120	20%
GDP PPP per population index	100	107	122	132	134	143	145	45%
Energy intensity index - TPES / GDP PPP	100	97	89	83	77	68	67	-33%
Carbon intensity index - CO ₂ / TPES	100	97	97	95	93	91	90	-10%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	3 496.8	4 720.0	3 231.2	143.5	11 591.4	5%
Electricity and heat generation	2 945.7	182.1	1 279.5	88.9	4 496.2	10%
Other energy industry own use	102.4	308.1	311.6	0.5	722.5	24%
Manufacturing industries and construction	375.5	283.1	620.7	43.5	1 322.8	-27%
Transport	0.1	3 420.8	61.3	-	3 482.1	27%
<i>of which: road</i>	-	3 071.5	9.8	-	3 081.3	31%
Other	73.1	525.9	958.2	10.6	1 567.8	-11%
<i>of which: residential</i>	47.8	217.2	589.2	-	854.2	-15%
<i>of which: services</i>	20.8	153.2	353.0	5.6	532.6	-2%
<i>Memo: international marine bunkers</i>	-	247.6	0.1	-	247.8	5%
<i>Memo: international aviation bunkers</i>	-	296.7	-	-	296.7	107%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	3071.5	2343.1	19.7	19.7
Main activity prod. elec. and heat - coal	2767.9	2894.3	17.7	37.4
Main activity prod. elec. and heat - gas	1137.2	334.1	7.3	44.7
Manufacturing industries - gas	620.7	534.9	4.0	48.7
Residential - gas	589.2	468.2	3.8	52.5
Manufacturing industries - coal	375.5	730.7	2.4	54.9
Non-specified other - gas	368.9	255.5	2.4	57.2
Other transport - oil	349.2	361.3	2.2	59.5
Other energy industry own use - gas	311.6	168.2	2.0	61.5
<i>Memo: total CO₂ from fuel combustion</i>	<i>11591.4</i>	<i>11016.7</i>	<i>74.3</i>	<i>74.3</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

OECD Americas

Figure 1. CO₂ emissions by fuel

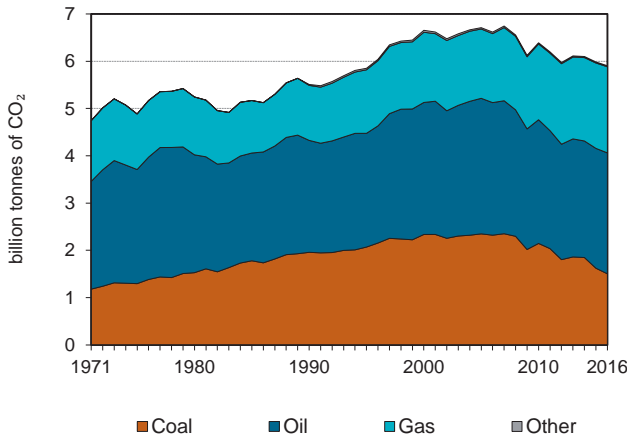


Figure 2. CO₂ emissions by sector

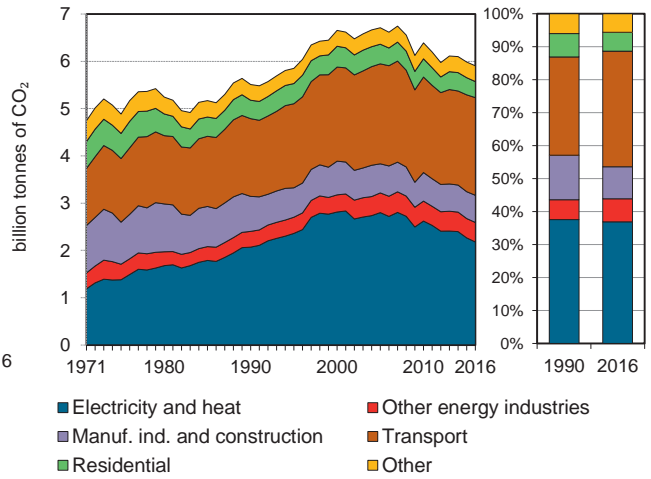


Figure 3. Electricity generation by fuel

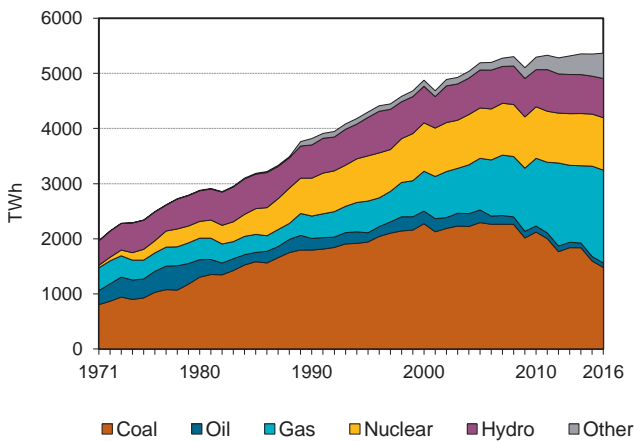


Figure 4. CO₂ from electricity generation: driving factors¹

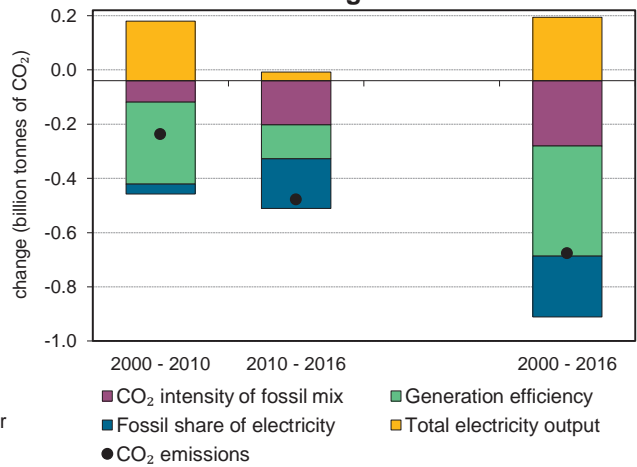


Figure 5. Changes in selected indicators

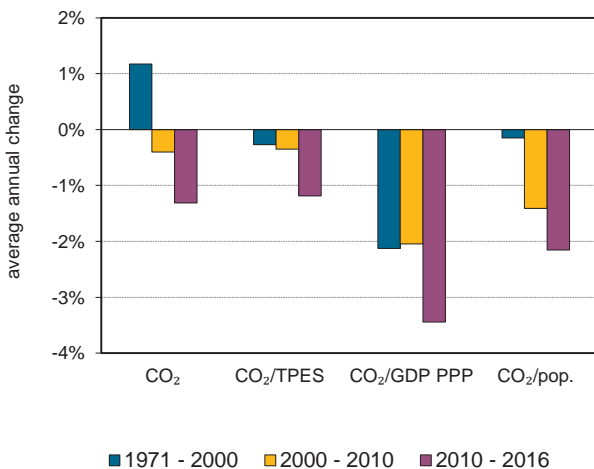
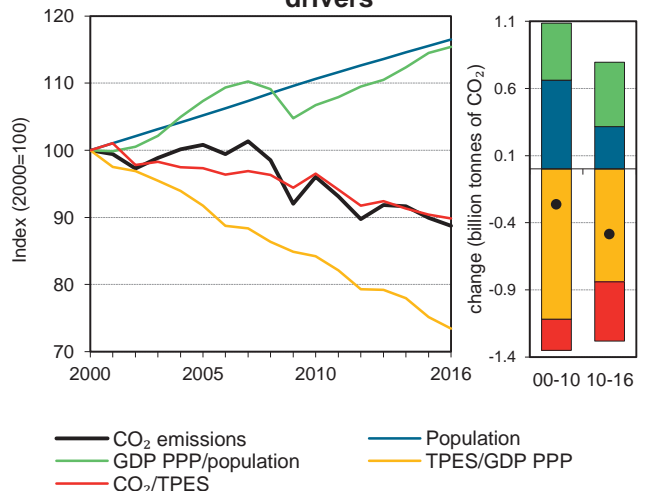


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

OECD Americas

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	5509.1	5 851.3	6 654.5	6 710.1	6 390.7	5 985.0	5 904.6	7%
Share of World CO ₂ from fuel combustion	26.9%	27.4%	28.7%	24.8%	21.0%	18.5%	18.3%	
TPES (PJ)	94789	102 631	113 183	117 268	112 597	112 577	111 774	18%
GDP (billion 2010 USD)	10797.2	12 223.7	15 115.5	17 097.0	17 854.2	19 963.2	20 275.3	88%
GDP PPP (billion 2010 USD)	11087	12 557.7	15 559.3	17 571.7	18 379.1	20 585.1	20 917.8	89%
Population (millions)	378.1	404.8	429.4	451.7	475.2	496.1	500.2	32%
CO ₂ / TPES (tCO ₂ per TJ)	58.1	57.0	58.8	57.2	56.8	53.2	52.8	-9%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.51	0.5	0.4	0.4	0.4	0.3	0.3	-43%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.5	0.5	0.4	0.4	0.3	0.3	0.3	-43%
CO ₂ / population (tCO ₂ per capita)	14.6	14.5	15.5	14.9	13.5	12.1	11.8	-19%
Share of electricity output from fossil fuels	63%	63%	67%	67%	66%	62%	61%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	541	542	571	535	488	418	400	-26%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	106	121	122	116	109	107	7%
Population index	100	107	114	119	126	131	132	32%
GDP PPP per population index	100	106	124	133	132	142	143	43%
Energy intensity index - TPES / GDP PPP	100	96	85	78	72	64	63	-38%
Carbon intensity index - CO ₂ / TPES	100	98	101	98	98	91	91	-9%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	1 504.5	2 557.2	1 821.7	21.2	5 904.6	7%
Electricity and heat generation	1 392.9	62.3	706.7	16.8	2 178.7	5%
Other energy industry own use	11.5	168.2	233.7	-	413.4	24%
Manufacturing industries and construction	97.9	119.1	354.0	3.6	574.6	-22%
Transport	-	2 016.4	49.5	-	2 065.9	26%
<i>of which: road</i>	-	1 757.1	2.5	-	1 759.6	32%
Other	2.2	191.3	477.7	0.9	672.0	-7%
<i>of which: residential</i>	0.0	65.3	273.8	-	339.2	-13%
<i>of which: services</i>	2.1	57.0	198.4	0.9	258.4	2%
<i>Memo: international marine bunkers</i>	-	58.4	-	-	58.4	-39%
<i>Memo: international aviation bunkers</i>	-	88.5	-	-	88.5	85%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	1757.1	1333.9	22.1	22.1
Main activity prod. elec. and heat - coal	1382.1	1656.3	17.4	39.5
Main activity prod. elec. and heat - gas	637.5	164.6	8.0	47.5
Manufacturing industries - gas	354.0	323.2	4.5	52.0
Residential - gas	273.8	269.8	3.4	55.4
Other transport - oil	259.3	267.3	3.3	58.7
Other energy industry own use - gas	233.7	139.1	2.9	61.7
Non-specified other - gas	203.8	164.7	2.6	64.2
Other energy industry own use - oil	168.2	185.9	2.1	66.3
<i>Memo: total CO₂ from fuel combustion</i>	<i>5904.6</i>	<i>5509.1</i>	<i>74.3</i>	<i>74.3</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

OECD Asia Oceania

Figure 1. CO₂ emissions by fuel

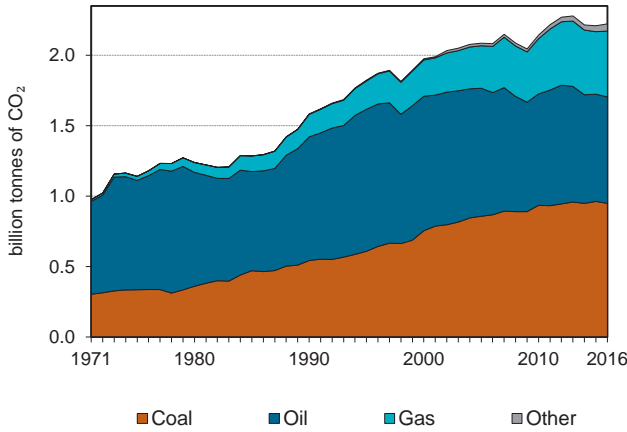


Figure 2. CO₂ emissions by sector

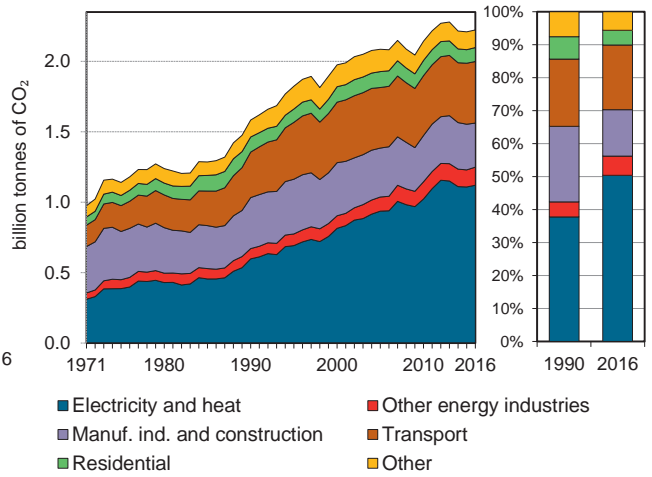


Figure 3. Electricity generation by fuel

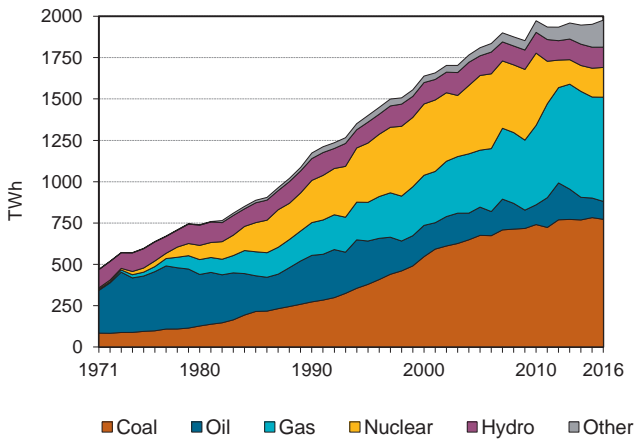


Figure 4. CO₂ from electricity generation: driving factors¹

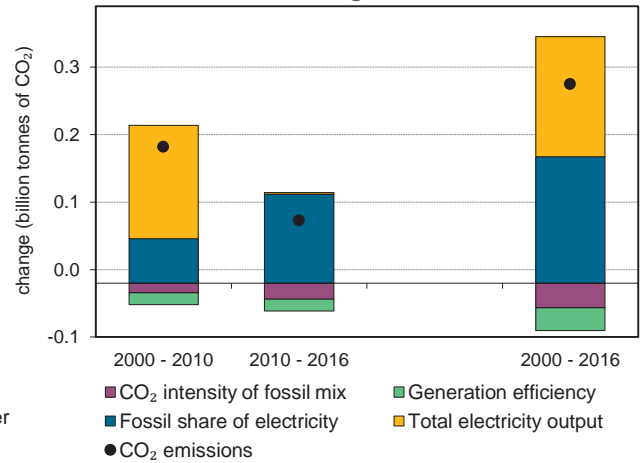


Figure 5. Changes in selected indicators

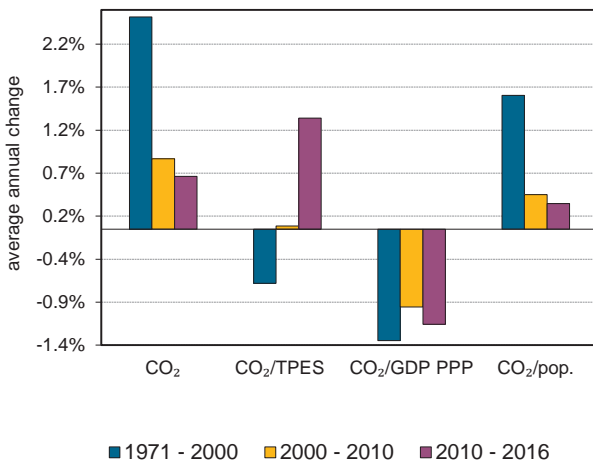
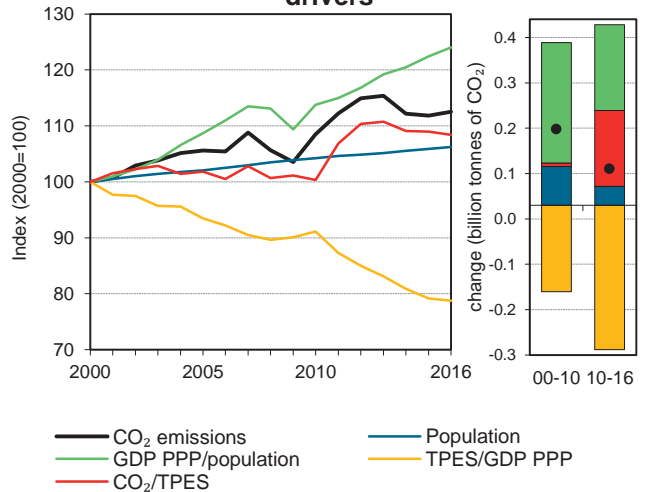


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

OECD Asia Oceania

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	1583.2	1 823.4	1 975.1	2 085.8	2 143.0	2 209.5	2 222.9	40%
Share of World CO ₂ from fuel combustion	7.7%	8.5%	8.5%	7.7%	7.0%	6.9%	6.9%	
TPES (PJ)	26861	31 867	35 552	36 874	38 433	36 494	36 916	37%
GDP (billion 2010 USD)	5919.9	6 627.4	7 299.1	8 023.5	8 472.1	9 206.5	9 346.1	58%
GDP PPP (billion 2010 USD)	4854.8	5 518.3	6 142.7	6 816.8	7 285.7	7 964.3	8 096.7	67%
Population (millions)	191.8	198.0	203.3	207.5	211.9	215.3	216.0	13%
CO ₂ / TPES (tCO ₂ per TJ)	58.9	57.2	55.6	56.6	55.8	60.5	60.2	2%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.27	0.3	0.3	0.3	0.3	0.2	0.2	-11%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.33	0.3	0.3	0.3	0.3	0.3	0.3	-16%
CO ₂ / population (tCO ₂ per capita)	8.3	9.2	9.7	10.1	10.1	10.3	10.3	25%
Share of electricity output from fossil fuels	64%	63%	63%	66%	68%	78%	77%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	508	491	492	509	510	559	556	9%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	115	125	132	135	140	140	40%
Population index	100	103	106	108	110	112	113	13%
GDP PPP per population index	100	110	119	130	136	146	148	48%
Energy intensity index - TPES / GDP PPP	100	104	105	98	95	83	82	-18%
Carbon intensity index - CO ₂ / TPES	100	97	94	96	95	103	102	2%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	948.6	755.6	467.5	51.2	2 222.9	40%
Electricity and heat generation	745.0	74.3	277.7	23.0	1 120.0	88%
Other energy industry own use	50.2	50.3	28.4	-	128.8	76%
Manufacturing industries and construction	150.5	76.4	66.4	19.6	312.9	-14%
Transport	0.0	433.5	3.6	-	437.1	35%
<i>of which: road</i>	-	390.5	3.2	-	393.7	40%
Other	2.9	121.1	91.5	8.6	224.1	-2%
<i>of which: residential</i>	2.3	46.6	50.1	-	99.1	-8%
<i>of which: services</i>	0.5	44.5	40.9	3.5	89.4	1%
<i>Memo: international marine bunkers</i>	-	52.2	-	-	52.2	95%
<i>Memo: international aviation bunkers</i>	-	52.6	-	-	52.6	144%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	644.0	244.0	22.7	22.7
Road - oil	390.5	281.2	13.8	36.5
Main activity prod. elec. and heat - gas	261.0	92.4	9.2	45.7
Manufacturing industries - coal	150.5	170.1	5.3	51.0
Unallocated autoproducers - coal	101.1	64.6	3.6	54.6
Manufacturing industries - oil	76.4	161.3	2.7	57.3
Non-specified other - oil	74.5	112.1	2.6	59.9
Manufacturing industries - gas	66.4	28.0	2.3	62.3
Main activity prod. elec. and heat - oil	51.9	161.1	1.8	64.1
<i>Memo: total CO₂ from fuel combustion</i>	<i>2222.9</i>	<i>1583.2</i>	<i>78.4</i>	<i>78.4</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

OECD Europe

Figure 1. CO₂ emissions by fuel

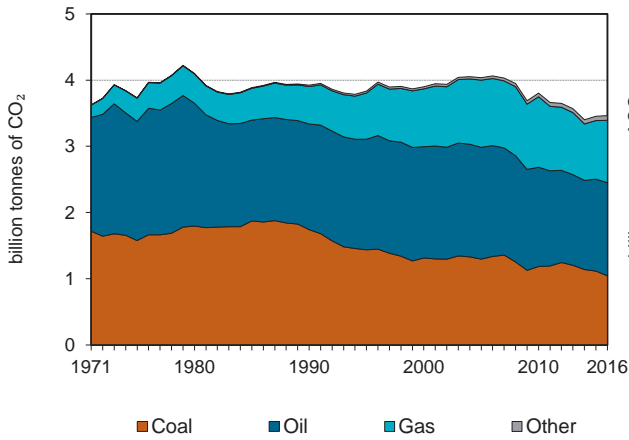


Figure 2. CO₂ emissions by sector

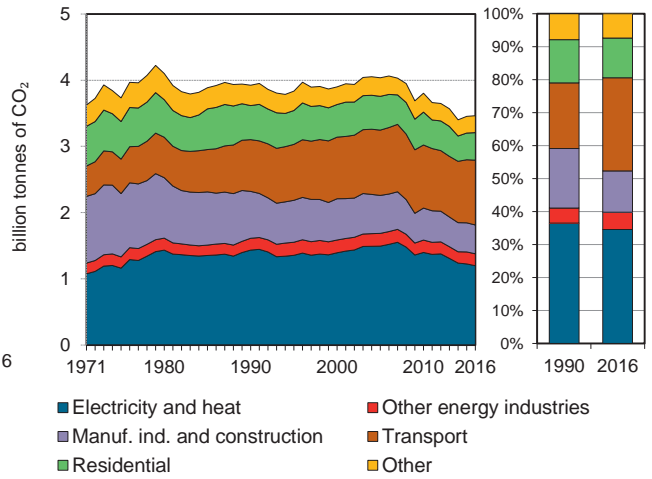


Figure 3. Electricity generation by fuel

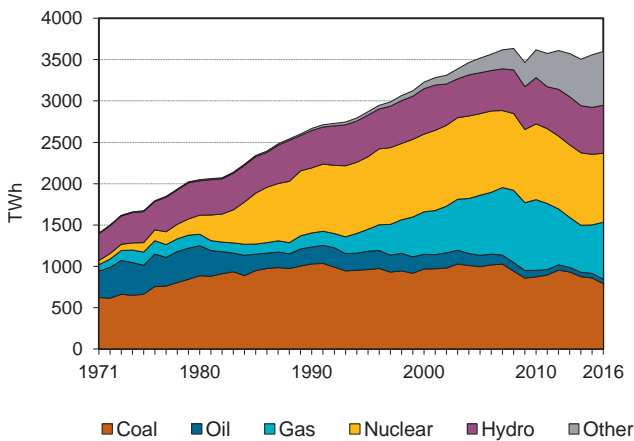


Figure 4. CO₂ from electricity generation: driving factors¹

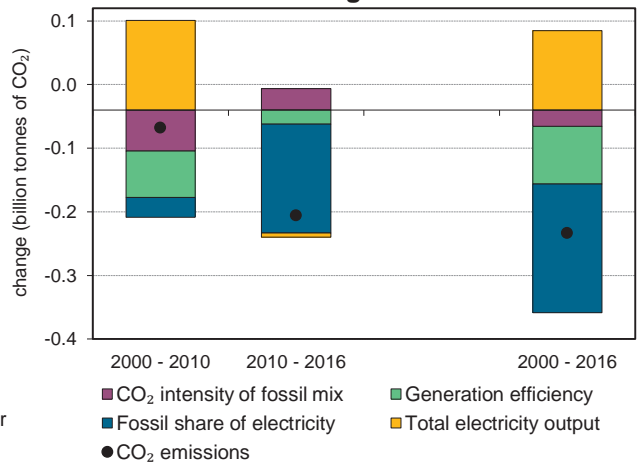


Figure 5. Changes in selected indicators

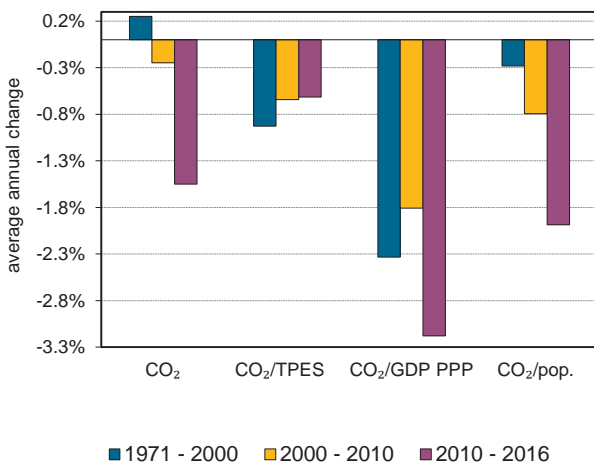
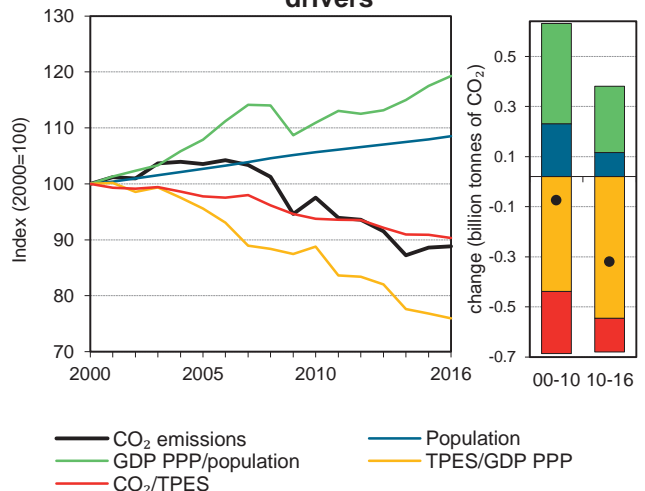


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

OECD Europe

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	3924.5	3 835.2	3 899.5	4 037.2	3 804.3	3 454.2	3 464.0	-12%
Share of World CO ₂ from fuel combustion	19.1%	17.9%	16.8%	14.9%	12.5%	10.7%	10.7%	
TPES (PJ)	68140	69 941	73 380	77 715	76 357	71 523	72 154	6%
GDP (billion 2010 USD)	12682.3	13 742.5	15 932.9	17 545.3	18 441.2	19 779.6	20 165.6	59%
GDP PPP (billion 2010 USD)	12314.3	13 307.9	15 468.9	17 143.7	18 128.6	19 622.0	20 019.6	63%
Population (millions)	503	514.4	523.8	538.0	553.3	565.5	568.3	13%
CO ₂ / TPES (tCO ₂ per TJ)	57.6	54.8	53.1	51.9	49.8	48.3	48.0	-17%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.31	0.3	0.2	0.2	0.2	0.2	0.2	-44%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.32	0.3	0.3	0.2	0.2	0.2	0.2	-46%
CO ₂ / population (tCO ₂ per capita)	7.8	7.5	7.4	7.5	6.9	6.1	6.1	-22%
Share of electricity output from fossil fuels	53%	51%	52%	53%	51%	43%	43%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	461	419	385	373	336	302	291	-37%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	98	99	103	97	88	88	-12%
Population index	100	102	104	107	110	112	113	13%
GDP PPP per population index	100	106	121	130	134	142	144	44%
Energy intensity index - TPES / GDP PPP	100	95	86	82	76	66	65	-35%
Carbon intensity index - CO ₂ / TPES	100	95	92	90	87	84	83	-17%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	1 043.8	1 407.2	942.0	71.0	3 464.0	-12%
Electricity and heat generation	807.8	45.5	295.1	49.1	1 197.5	-16%
Other energy industry own use	40.7	89.7	49.5	0.5	180.4	1%
Manufacturing industries and construction	127.1	87.6	200.2	20.3	435.3	-39%
Transport	0.0	970.9	8.2	-	979.1	25%
<i>of which: road</i>	-	924.0	4.1	-	928.1	27%
Other	68.0	213.5	389.0	1.2	671.7	-18%
<i>of which: residential</i>	45.4	105.2	265.3	-	416.0	-19%
<i>of which: services</i>	18.2	51.7	113.7	1.2	184.8	-8%
<i>Memo: international marine bunkers</i>	-	137.0	0.1	-	137.1	20%
<i>Memo: international aviation bunkers</i>	-	155.7	-	-	155.7	110%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	924.0	728.0	19.1	19.1
Main activity prod. elec. and heat - coal	741.8	994.1	15.4	34.5
Residential - gas	265.3	175.3	5.5	40.0
Main activity prod. elec. and heat - gas	238.7	77.1	4.9	44.9
Manufacturing industries - gas	200.2	183.7	4.1	49.1
Manufacturing industries - coal	127.1	324.5	2.6	51.7
Non-specified other - gas	123.8	83.6	2.6	54.3
Non-specified other - oil	108.2	156.7	2.2	56.5
Residential - oil	105.2	200.6	2.2	58.7
<i>Memo: total CO₂ from fuel combustion</i>	<i>3464.0</i>	<i>3924.5</i>	<i>71.7</i>	<i>71.7</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

European Union - 28

Figure 1. CO₂ emissions by fuel

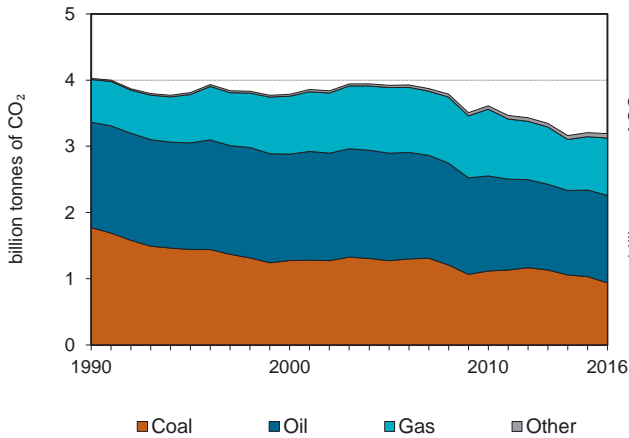


Figure 2. CO₂ emissions by sector

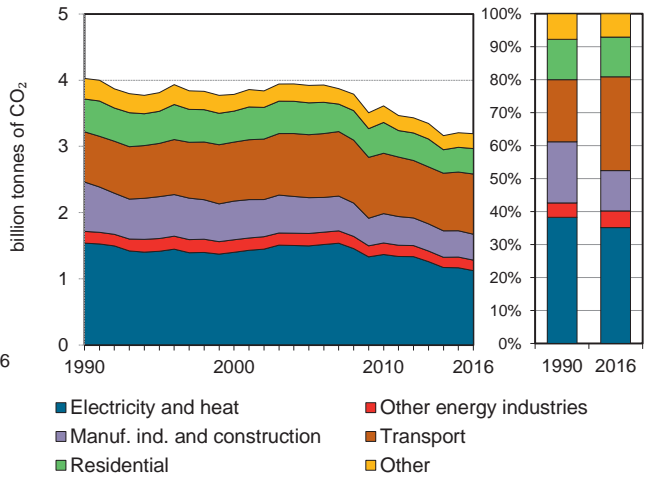


Figure 3. Electricity generation by fuel

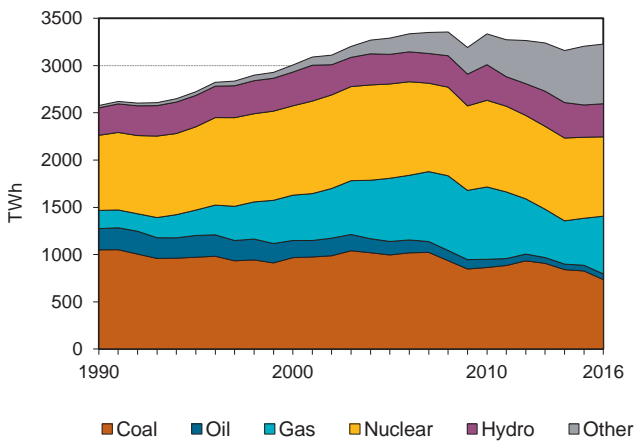


Figure 4. CO₂ from electricity generation: driving factors¹

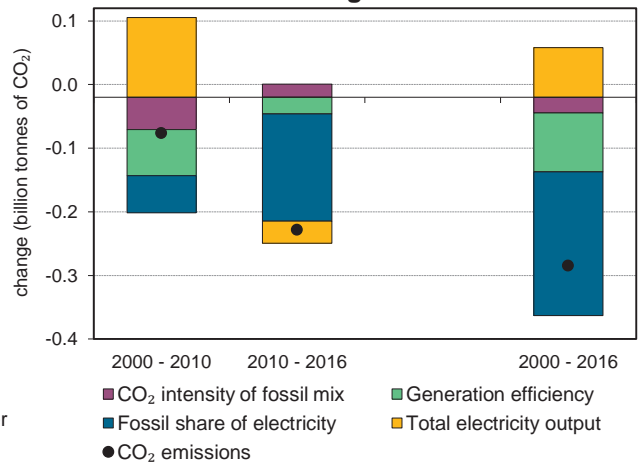


Figure 5. Changes in selected indicators

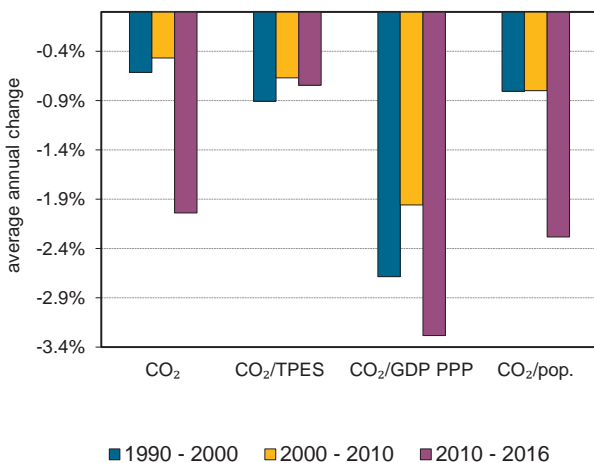
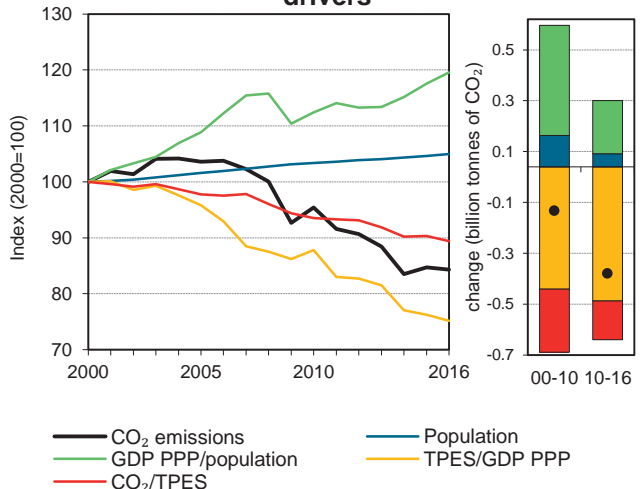


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

European Union - 28

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	4027.2	3 812.3	3 786.1	3 921.7	3 612.4	3 206.6	3 192.3	-21%
Share of World CO ₂ from fuel combustion	19.6%	17.8%	16.3%	14.5%	11.9%	9.9%	9.9%	
TPES (PJ)	68933	69 017	70 976	75 214	72 417	66 550	66 930	-3%
GDP (billion 2010 USD)	11874.8	12 789.6	14 787.5	16 254.1	16 992.8	17 956.8	18 308.2	54%
GDP PPP (billion 2010 USD)	11703	12 502.9	14 453.3	15 983.5	16 797.8	17 776.8	18 135.6	55%
Population (millions)	478	483.3	487.1	494.9	503.7	509.7	511.3	7%
CO ₂ / TPES (tCO ₂ per TJ)	58.4	55.2	53.3	52.1	49.9	48.2	47.7	-18%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.34	0.3	0.3	0.2	0.2	0.2	0.2	-49%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.34	0.3	0.3	0.2	0.2	0.2	0.2	-49%
CO ₂ / population (tCO ₂ per capita)	8.4	7.9	7.8	7.9	7.2	6.3	6.2	-26%
Share of electricity output from fossil fuels	57%	54%	55%	55%	52%	44%	44%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	502	452	410	396	352	315	299	-40%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	95	94	97	90	80	79	-21%
Population index	100	101	102	104	105	107	107	7%
GDP PPP per population index	100	106	121	132	136	142	145	45%
Energy intensity index - TPES / GDP PPP	100	94	83	80	73	64	63	-37%
Carbon intensity index - CO ₂ / TPES	100	95	91	89	85	82	82	-18%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	937.8	1 321.3	866.4	66.9	3 192.3	-21%
Electricity and heat generation	757.2	49.9	269.8	46.3	1 123.2	-27%
Other energy industry own use	34.5	86.7	37.2	0.5	158.9	-10%
Manufacturing industries and construction	99.9	86.8	185.9	19.1	391.7	-48%
Transport	0.0	901.6	7.7	-	909.4	20%
<i>of which: road</i>	-	863.1	4.1	-	867.2	23%
Other	46.1	196.1	365.8	1.0	609.1	-24%
<i>of which: residential</i>	38.1	99.3	247.0	-	384.4	-22%
<i>of which: services</i>	3.6	47.3	108.7	1.0	160.6	-19%
<i>Memo: international marine bunkers</i>	-	141.3	0.0	-	141.3	25%
<i>Memo: international aviation bunkers</i>	-	141.1	-	-	141.1	95%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	863.1	706.7	20.5	20.5
Main activity prod. elec. and heat - coal	702.2	1027.9	16.6	37.1
Residential - gas	247.0	180.1	5.9	42.9
Main activity prod. elec. and heat - gas	217.1	105.7	5.1	48.1
Manufacturing industries - gas	185.9	229.0	4.4	52.5
Non-specified other - gas	118.8	85.8	2.8	55.3
Manufacturing industries - coal	99.9	320.3	2.4	57.7
Residential - oil	99.3	182.5	2.4	60.0
Non-specified other - oil	96.8	156.2	2.3	62.3
<i>Memo: total CO₂ from fuel combustion</i>	<i>3192.3</i>	<i>4027.2</i>	<i>75.7</i>	<i>75.7</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Non-OECD Total

Figure 1. CO₂ emissions by fuel

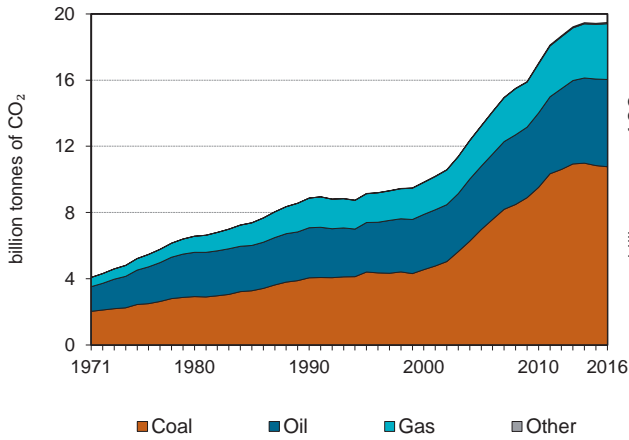


Figure 2. CO₂ emissions by sector

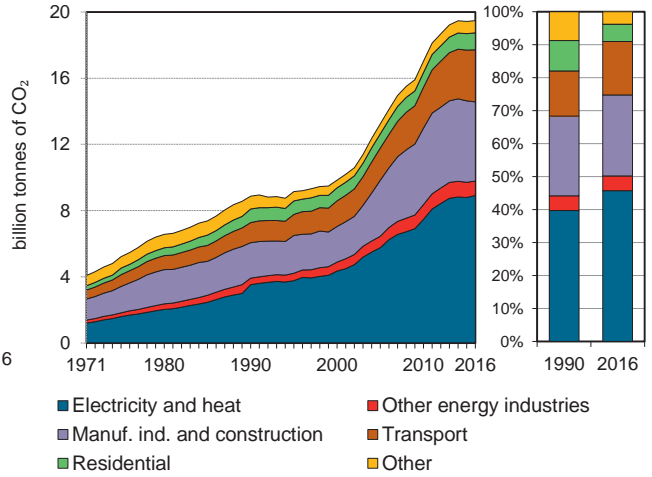


Figure 3. Electricity generation by fuel

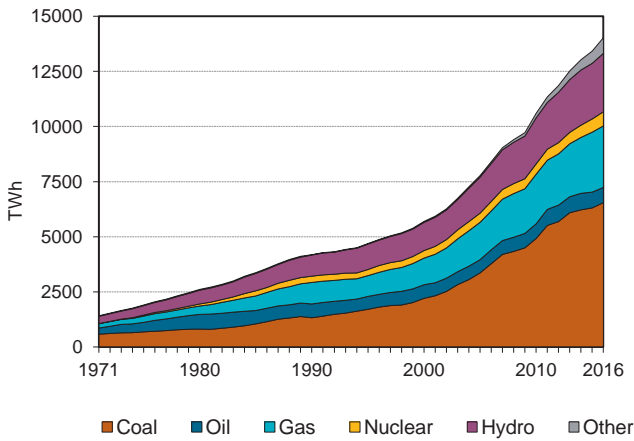


Figure 4. CO₂ from electricity generation: driving factors¹

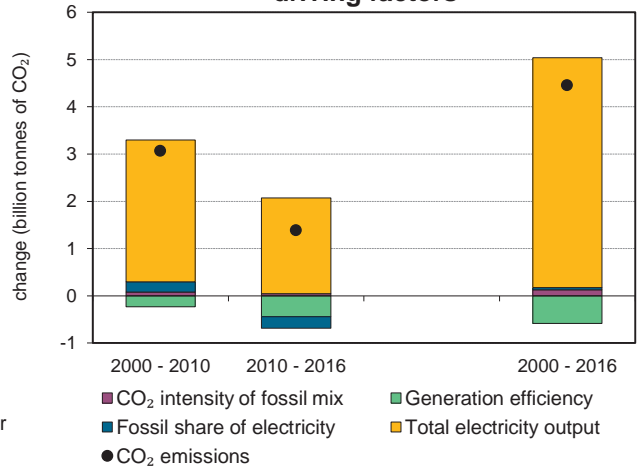


Figure 5. Changes in selected indicators

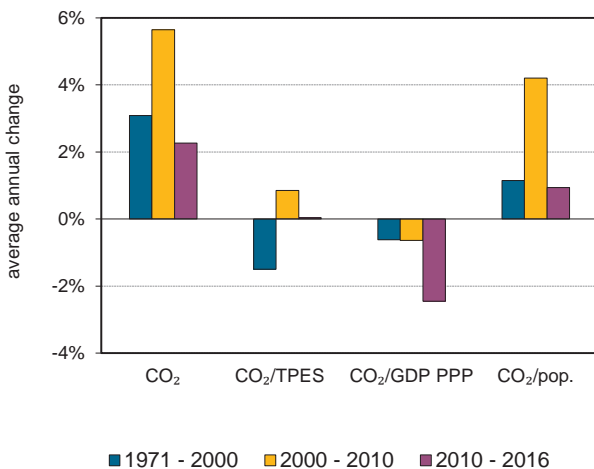
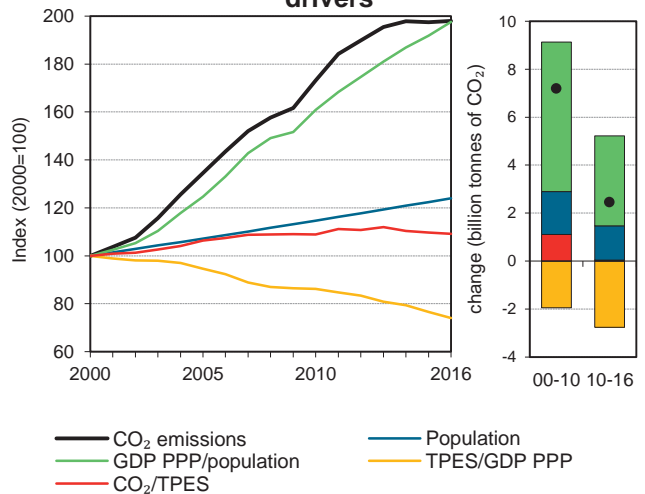


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Non-OECD Total

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	8870.9	9 151.1	9 840.3	13 242.5	17 031.7	19 433.4	19 482.7	120%
Share of World CO ₂ from fuel combustion	43.2%	42.8%	42.4%	48.9%	55.9%	60.2%	60.3%	
TPES (PJ)	169079	172 178	186 593	236 063	296 702	335 761	338 635	100%
GDP (billion 2010 USD)	8543.8	9 592.2	11 630.6	15 418.6	21 176.5	26 647.4	27 575.5	223%
GDP PPP (billion 2010 USD)	17841.1	20 089.8	24 567.7	32 831.7	45 316.8	57 715.6	60 196.6	237%
Population (millions)	4207.1	4 587.9	4 954.5	5 311.8	5 680.9	6 066.4	6 144.8	46%
CO ₂ / TPES (tCO ₂ per TJ)	52.5	53.1	52.7	56.1	57.4	57.9	57.5	10%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.04	1.0	0.8	0.9	0.8	0.7	0.7	-32%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.5	0.5	0.4	0.4	0.4	0.3	0.3	-35%
CO ₂ / population (tCO ₂ per capita)	2.1	2.0	2.0	2.5	3.0	3.2	3.2	50%
Share of electricity output from fossil fuels	70%	69%	71%	73%	74%	73%	72%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	577	606	608	629	617	584	566	-2%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	103	111	149	192	219	220	120%
Population index	100	109	118	126	135	144	146	46%
GDP PPP per population index	100	103	117	146	188	224	231	131%
Energy intensity index - TPES / GDP PPP	100	90	80	76	69	61	59	-41%
Carbon intensity index - CO ₂ / TPES	100	101	101	107	109	110	110	10%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	10 768.5	5 271.9	3 373.8	68.6	19 482.7	120%
Electricity and heat generation	6 594.2	607.6	1 655.5	58.9	8 916.2	153%
Other energy industry own use	203.7	293.7	372.1	0.9	870.4	121%
Manufacturing industries and construction	3 439.2	697.2	642.4	7.7	4 786.5	123%
Transport	0.2	2 965.7	177.9	..	3 143.8	159%
<i>of which: road</i>	..	2 682.5	88.8	..	2 771.3	189%
Other	531.1	707.7	525.9	1.1	1 765.8	11%
<i>of which: residential</i>	238.8	367.2	423.7	..	1 029.7	25%
<i>of which: services</i>	113.6	102.6	87.3	0.8	304.2	32%
<i>Memo: international marine bunkers</i>	..	434.6	..	..	434.6	221%
<i>Memo: international aviation bunkers</i>	..	261.0	..	..	261.0	126%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	5974.6	1724.3	18.5	18.5
Manufacturing industries - coal	3439.2	1329.0	10.6	29.1
Road - oil	2682.5	956.0	8.3	37.4
Main activity prod. elec. and heat - gas	1325.2	700.9	4.1	41.5
Manufacturing industries - oil	697.2	497.6	2.2	43.7
Manufacturing industries - gas	642.4	316.1	2.0	45.7
Unallocated autoproducers - coal	619.6	137.2	1.9	47.6
Main activity prod. elec. and heat - oil	490.9	600.6	1.5	49.1
Residential - gas	423.7	177.4	1.3	50.4
<i>Memo: total CO₂ from fuel combustion</i>	<i>19482.7</i>	<i>8870.9</i>	<i>60.3</i>	<i>60.3</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Non-OECD Europe and Eurasia

Figure 1. CO₂ emissions by fuel

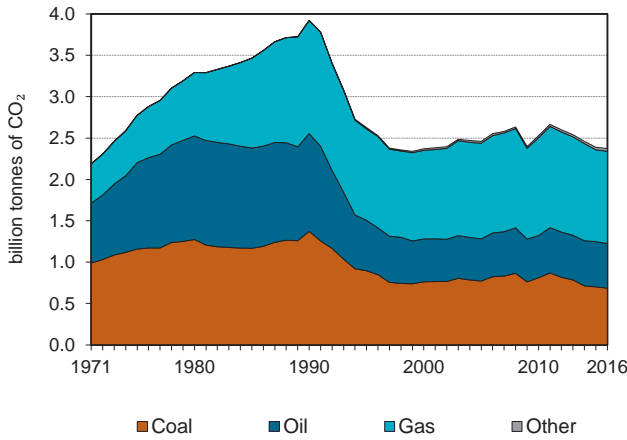


Figure 2. CO₂ emissions by sector

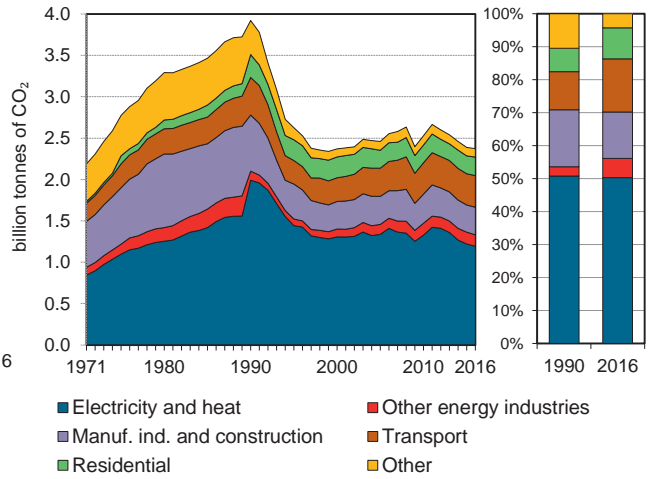


Figure 3. Electricity generation by fuel

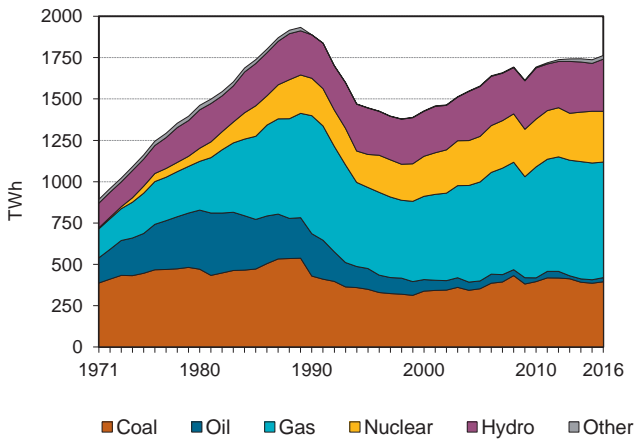


Figure 4. CO₂ from electricity generation: driving factors¹

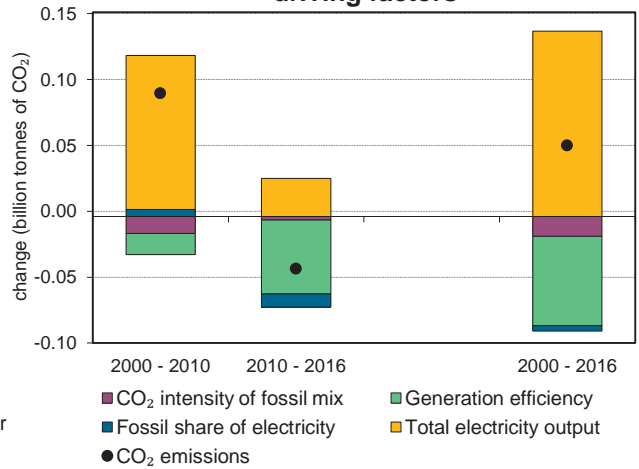


Figure 5. Changes in selected indicators

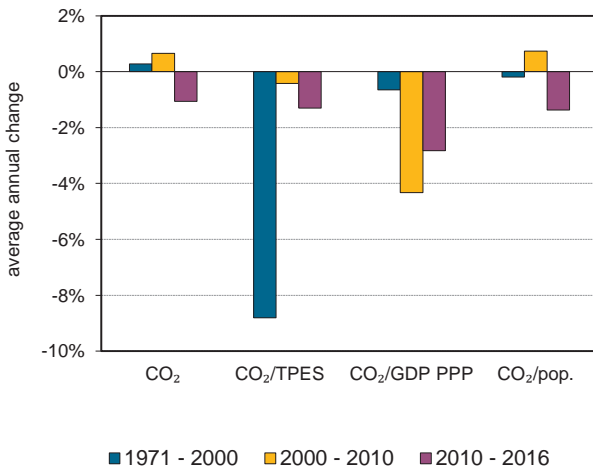
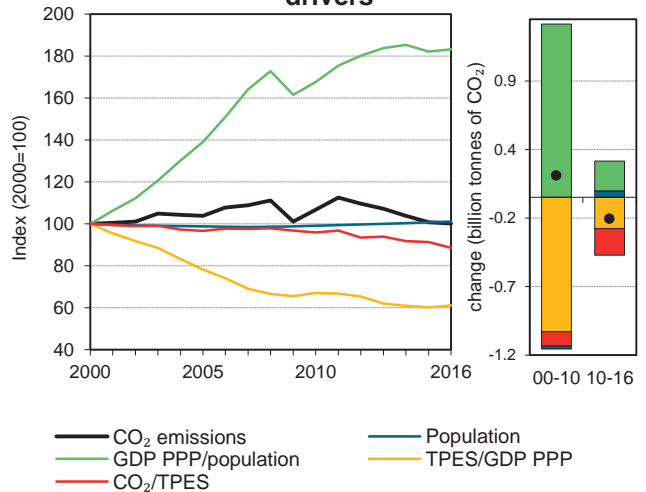


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Non-OECD Europe and Eurasia

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	3921.8	2 626.3	2 370.3	2 459.9	2 529.3	2 388.0	2 373.0	-39%
Share of World CO ₂ from fuel combustion	19.1%	12.3%	10.2%	9.1%	8.3%	7.4%	7.3%	
TPES (PJ)	64048	44 817	41 878	44 946	46 618	46 196	47 327	-26%
GDP (billion 2010 USD)	2143.4	1 371.5	1 494.7	2 043.1	2 456.8	2 677.4	2 700.9	26%
GDP PPP (billion 2010 USD)	4363.5	2 762.4	3 004.0	4 125.3	4 992.5	5 509.7	5 562.4	27%
Population (millions)	340.9	342.2	338.5	334.1	335.5	340.9	342.1	0%
CO ₂ / TPES (tCO ₂ per TJ)	61.2	58.6	56.6	54.7	54.3	51.7	50.1	-18%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.83	1.9	1.6	1.2	1.0	0.9	0.9	-52%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.9	1.0	0.8	0.6	0.5	0.4	0.4	-53%
CO ₂ / population (tCO ₂ per capita)	11.5	7.7	7.0	7.4	7.5	7.0	6.9	-40%
Share of electricity output from fossil fuels	74%	67%	64%	63%	65%	64%	64%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	508	457	448	459	434	414	394	-22%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	67	60	63	64	61	61	-39%
Population index	100	100	99	98	98	100	100	0%
GDP PPP per population index	100	63	69	96	116	126	127	27%
Energy intensity index - TPES / GDP PPP	100	111	95	74	64	57	58	-42%
Carbon intensity index - CO ₂ / TPES	100	96	92	89	89	84	82	-18%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16	
CO₂ fuel combustion	686.2	538.7	1 115.7	32.5	2 373.0	-39%	
Electricity and heat generation	516.0		41.5	612.3	23.3	1 193.1	-40%
Other energy industry own use	8.3		47.2	82.1	0.9	138.5	26%
Manufacturing industries and construction	132.1		71.4	122.9	7.2	333.6	-51%
Transport	0.0		300.7	82.0	..	382.7	-16%
<i>of which: road</i>	..		270.6	2.3	..	272.8	-5%
Other	29.7		77.9	216.4	1.1	325.1	-53%
<i>of which: residential</i>	16.2		31.1	175.8	..	223.2	-19%
<i>of which: services</i>	9.7		10.7	34.5	0.8	55.7	-57%
<i>Memo: international marine bunkers</i>	..		53.6	..	..	53.6	335%
<i>Memo: international aviation bunkers</i>	..		23.0	..	..	23.0	-46%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - gas	441.8	560.3	11.9	11.9
Main activity prod. elec. and heat - coal	434.7	713.6	11.7	23.5
Road - oil	270.6	285.1	7.3	30.8
Residential - gas	175.8	149.7	4.7	35.5
Unallocated autoproducers - gas	170.5	217.9	4.6	40.1
Manufacturing industries - coal	132.1	317.2	3.5	43.6
Manufacturing industries - gas	122.9	201.2	3.3	46.9
Other energy industry own use - gas	82.1	35.9	2.2	49.1
Unallocated autoproducers - coal	81.3	101.5	2.2	51.3
<i>Memo: total CO₂ from fuel combustion</i>	<i>2373.0</i>	<i>3921.8</i>	<i>63.7</i>	<i>63.7</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Asia (excluding China)

Figure 1. CO₂ emissions by fuel

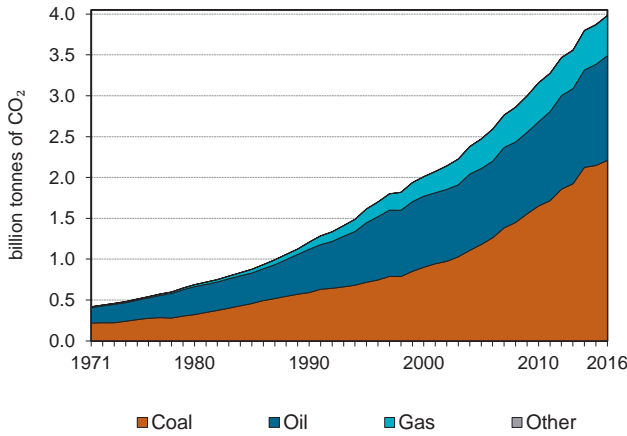


Figure 2. CO₂ emissions by sector

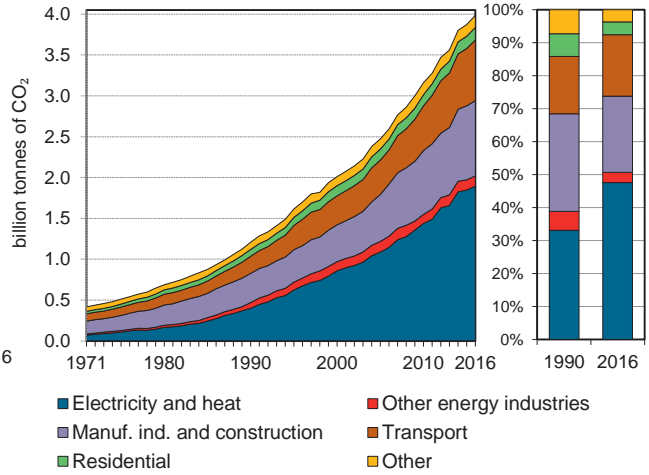


Figure 3. Electricity generation by fuel

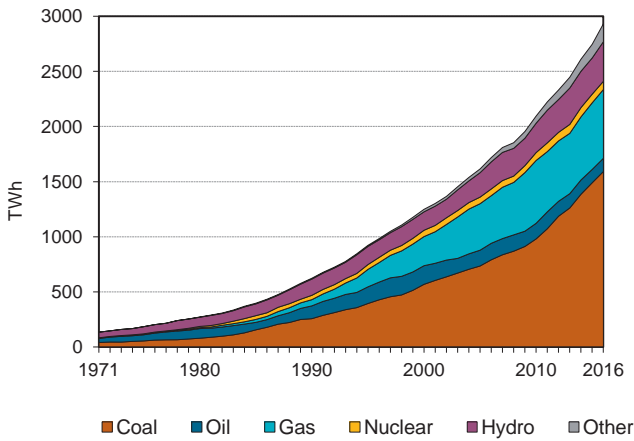


Figure 4. CO₂ from electricity generation: driving factors¹

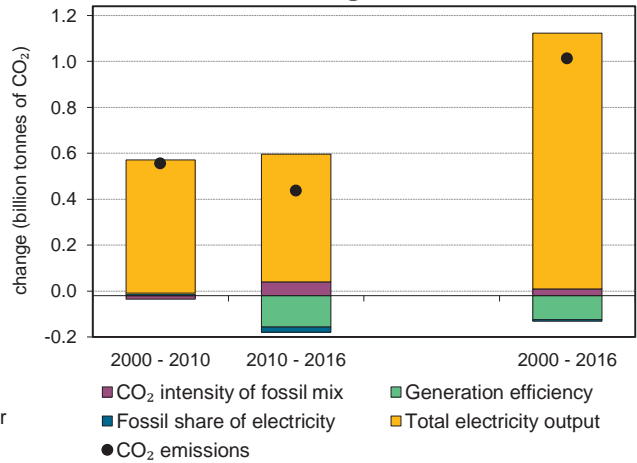


Figure 5. Changes in selected indicators

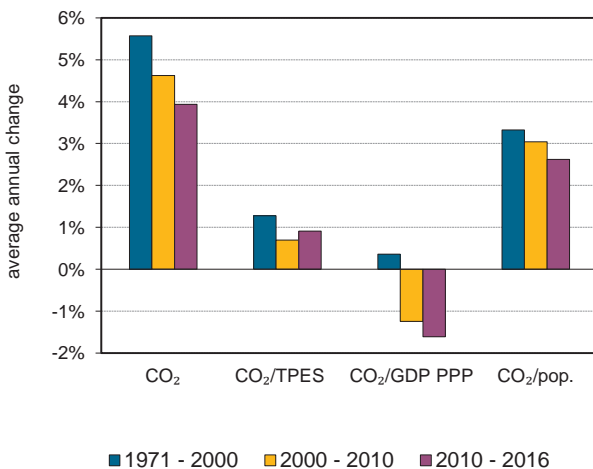
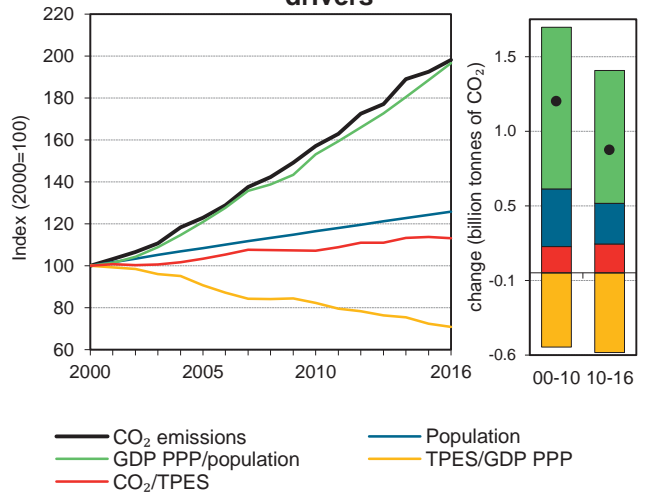


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Asia (excluding China)

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	1208.4	1 615.1	2 011.3	2 472.5	3 160.9	3 872.8	3 985.0	230%
Share of World CO ₂ from fuel combustion	5.9%	7.6%	8.7%	9.1%	10.4%	12.0%	12.3%	
TPES (PJ)	29179	36 300	43 439	51 663	63 694	73 584	76 044	161%
GDP (billion 2010 USD)	1595.2	2 138.8	2 594.4	3 379.2	4 563.3	5 938.8	6 253.8	292%
GDP PPP (billion 2010 USD)	4451.1	5 891.6	7 156.5	9 382.5	12 757.9	16 755.3	17 695.9	298%
Population (millions)	1624	1 794.2	1 964.1	2 130.5	2 287.2	2 439.8	2 469.6	52%
CO ₂ / TPES (tCO ₂ per TJ)	41.4	44.5	46.3	47.9	49.6	52.6	52.4	27%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.76	0.8	0.8	0.7	0.7	0.7	0.6	-16%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.27	0.3	0.3	0.3	0.2	0.2	0.2	-17%
CO ₂ / population (tCO ₂ per capita)	0.7	0.9	1.0	1.2	1.4	1.6	1.6	117%
Share of electricity output from fossil fuels	69%	76%	80%	81%	81%	81%	80%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	634	673	685	671	685	671	645	2%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	134	166	205	262	320	330	230%
Population index	100	110	121	131	141	150	152	52%
GDP PPP per population index	100	120	133	161	204	251	261	161%
Energy intensity index - TPES / GDP PPP	100	94	93	84	76	67	66	-34%
Carbon intensity index - CO ₂ / TPES	100	107	112	116	120	127	127	27%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	2 209.3	1 281.9	488.6	5.2	3 985.0	230%
Electricity and heat generation	1 510.2	93.4	286.4	5.2	1 895.2	374%
Other energy industry own use	13.9	55.3	55.4	-	124.5	80%
Manufacturing industries and construction	623.8	200.6	97.0	0.0	921.4	157%
Transport	0.1	724.4	18.1	-	742.6	255%
<i>of which: road</i>	-	669.7	17.1	-	686.8	281%
Other	61.4	208.1	31.8	-	301.3	75%
<i>of which: residential</i>	16.7	112.3	24.8	-	153.9	84%
<i>of which: services</i>	18.7	26.7	6.2	-	51.6	127%
<i>Memo: international marine bunkers</i>	-	170.3	-	-	170.3	268%
<i>Memo: international aviation bunkers</i>	-	85.8	-	-	85.8	277%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	1283.8	249.7	18.1	18.1
Road - oil	669.7	180.4	9.5	27.6
Manufacturing industries - coal	623.8	248.4	8.8	36.4
Main activity prod. elec. and heat - gas	249.0	34.8	3.5	39.9
Unallocated autoproducers - coal	226.3	16.8	3.2	43.1
Manufacturing industries - oil	200.6	95.5	2.8	45.9
Residential - oil	112.3	65.9	1.6	47.5
Manufacturing industries - gas	97.0	14.1	1.4	48.9
Non-specified other - oil	95.8	40.8	1.4	50.2
<i>Memo: total CO₂ from fuel combustion</i>	<i>3985.0</i>	<i>1208.4</i>	<i>56.3</i>	<i>56.3</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

China (incl. Hong Kong, China)

Figure 1. CO₂ emissions by fuel

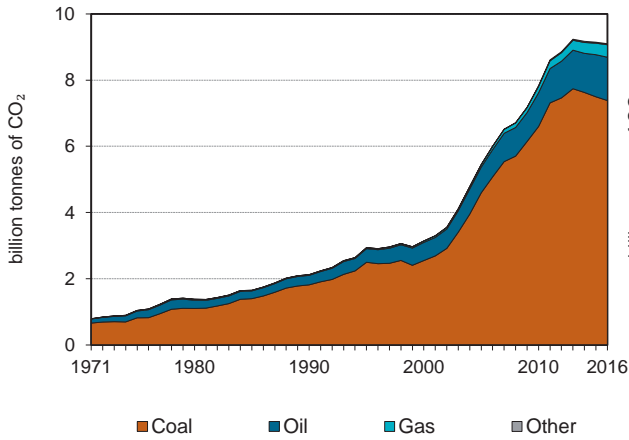


Figure 2. CO₂ emissions by sector

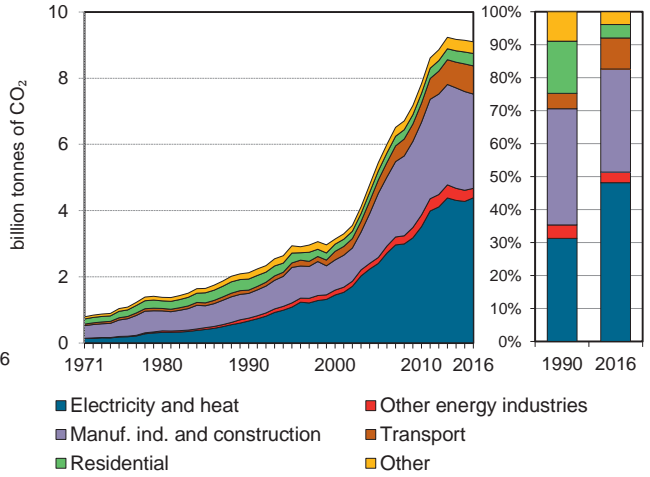


Figure 3. Electricity generation by fuel

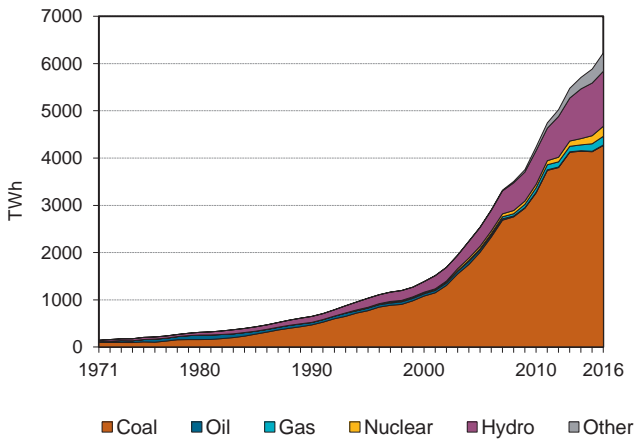


Figure 4. CO₂ from electricity generation: driving factors¹

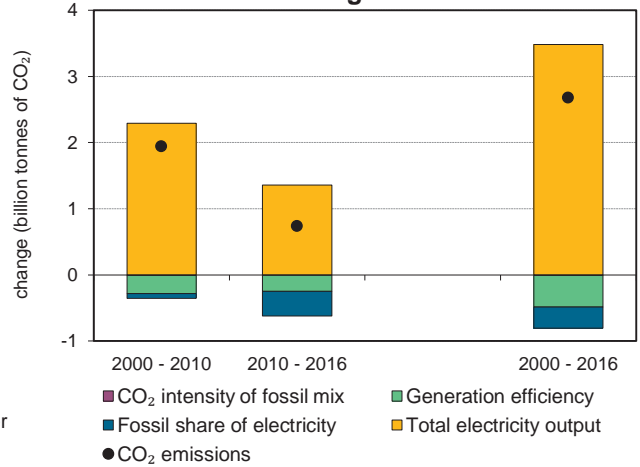


Figure 5. Changes in selected indicators

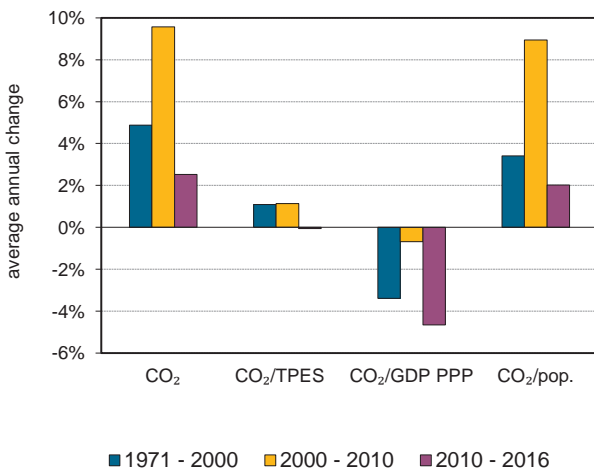
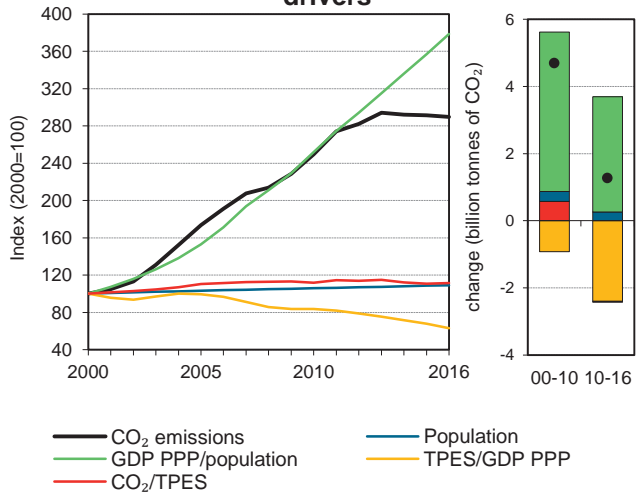


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

China (incl. Hong Kong, China)

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	2122.2	2 936.8	3 140.0	5 447.8	7 833.6	9 146.6	9 101.5	329%
Share of World CO ₂ from fuel combustion	10.3%	13.7%	13.5%	20.1%	25.7%	28.3%	28.2%	
TPES (PJ)	36938	44 172	47 875	75 111	106 758	125 827	124 454	237%
GDP (billion 2010 USD)	933.7	1 613.8	2 390.5	3 758.5	6 329.3	9 172.7	9 775.0	947%
GDP PPP (billion 2010 USD)	1848.5	3 222.0	4 800.3	7 578.9	12 816.1	18 613.8	19 841.1	973%
Population (millions)	1140.9	1 211.0	1 269.3	1 310.5	1 344.7	1 378.5	1 386.0	21%
CO ₂ / TPES (tCO ₂ per TJ)	57.5	66.5	65.6	72.5	73.4	72.7	73.1	27%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	2.27	1.8	1.3	1.4	1.2	1.0	0.9	-59%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	1.15	0.9	0.7	0.7	0.6	0.5	0.5	-60%
CO ₂ / population (tCO ₂ per capita)	1.9	2.4	2.5	4.2	5.8	6.6	6.6	253%
Share of electricity output from fossil fuels	81%	80%	83%	82%	80%	73%	72%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	909	915	889	844	749	650	627	-31%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	138	148	257	369	431	429	329%
Population index	100	106	111	115	118	121	121	21%
GDP PPP per population index	100	164	233	357	588	833	884	784%
Energy intensity index - TPES / GDP PPP	100	69	50	50	42	34	31	-69%
Carbon intensity index - CO ₂ / TPES	100	116	114	126	128	127	127	27%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	7 385.2	1 308.4	377.5	30.4	9 101.5	329%
Electricity and heat generation	4 246.4	25.6	84.0	30.4	4 386.4	561%
Other energy industry own use	137.3	98.0	50.5	-	285.8	232%
Manufacturing industries and construction	2 582.5	167.1	100.0	-	2 849.7	281%
Transport	0.1	810.2	40.9	-	851.2	762%
<i>of which: road</i>	-	665.5	40.1	-	705.6	+
Other	418.9	207.5	102.0	-	728.4	39%
<i>of which: residential</i>	192.9	106.6	75.4	-	374.9	12%
<i>of which: services</i>	78.9	46.6	26.4	-	151.8	198%
<i>Memo: international marine bunkers</i>	-	59.9	-	-	59.9	573%
<i>Memo: international aviation bunkers</i>	-	45.3	-	-	45.3	549%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	3971.9	607.7	30.3	30.3
Manufacturing industries - coal	2582.5	676.0	19.7	50.0
Road - oil	665.5	63.1	5.1	55.1
Unallocated autoproducers - coal	274.5	1.4	2.1	57.2
Non-specified other sectors - coal	226.0	129.6	1.7	58.9
Residential - coal	192.9	322.4	1.5	60.4
Manufacturing industries - oil	167.1	66.3	1.3	61.7
Other transport - oil	144.7	9.6	1.1	62.8
Other energy industry - coal	137.3	51.8	1.0	63.8
<i>Memo: total CO₂ from fuel combustion</i>	<i>9101.5</i>	<i>2122.2</i>	<i>69.5</i>	<i>69.5</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Non-OECD Americas

Figure 1. CO₂ emissions by fuel

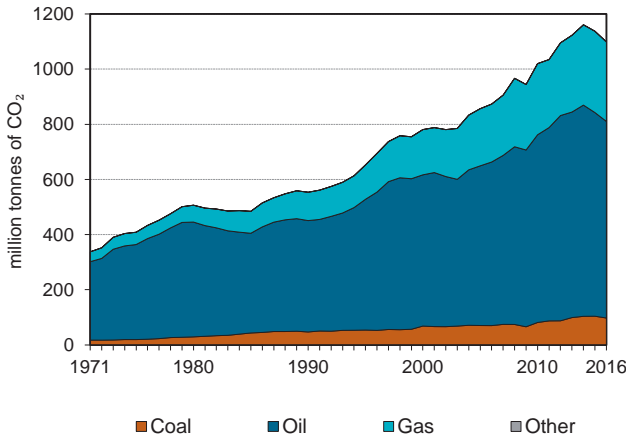


Figure 2. CO₂ emissions by sector

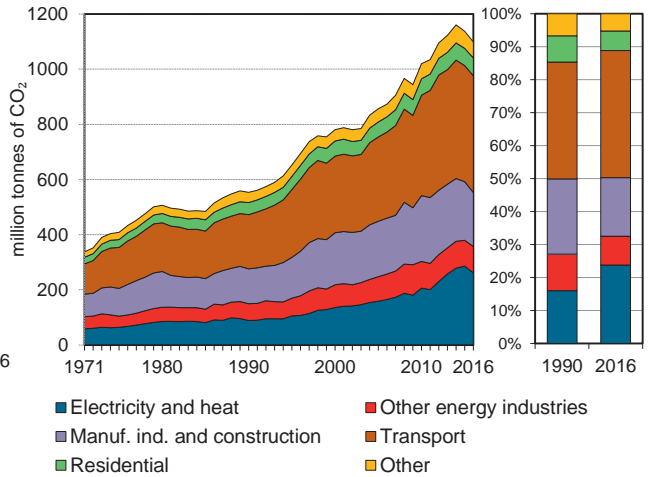


Figure 3. Electricity generation by fuel

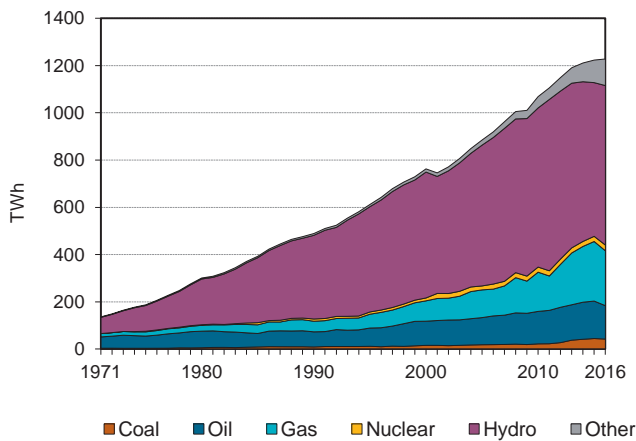


Figure 4. CO₂ from electricity generation: driving factors¹

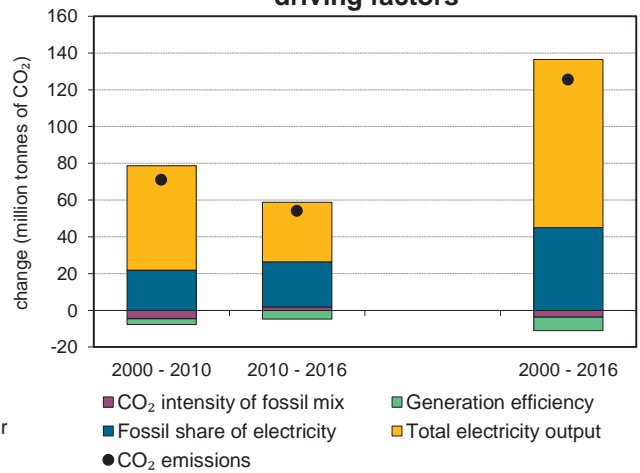


Figure 5. Changes in selected indicators

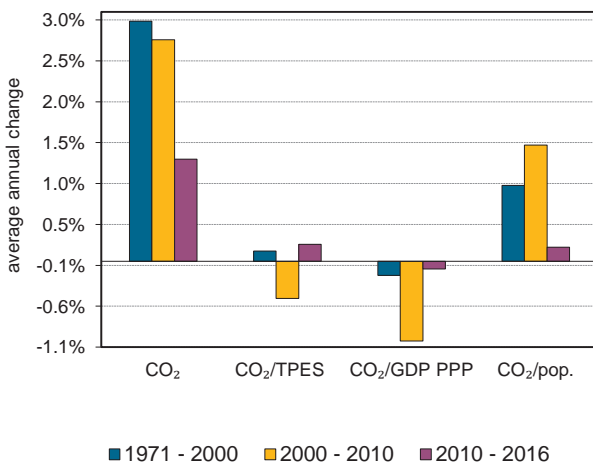
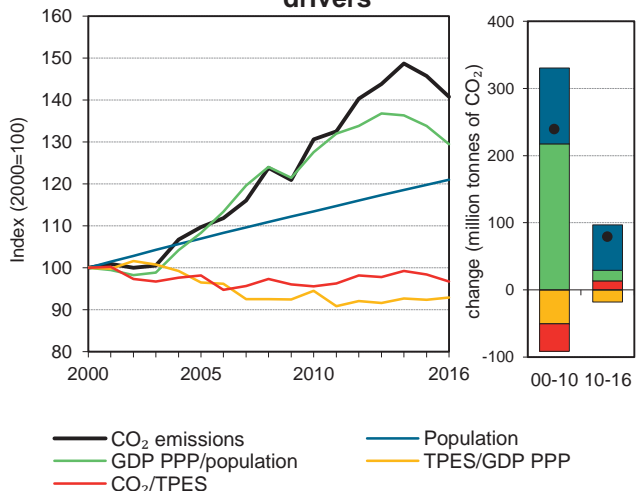


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Non-OECD Americas

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	553.5	652.7	780.7	856.5	1 019.9	1 137.4	1 098.8	99%
Share of World CO ₂ from fuel combustion	2.7%	3.1%	3.4%	3.2%	3.3%	3.5%	3.4%	
TPES (PJ)	13675	15 493	17 760	19 851	24 279	26 289	25 835	89%
GDP (billion 2010 USD)	2096.7	2 486.8	2 762.4	3 190.2	3 971.0	4 341.4	4 206.4	101%
GDP PPP (billion 2010 USD)	3056.9	3 615.2	4 036.3	4 676.4	5 840.0	6 467.5	6 320.6	107%
Population (millions)	343.4	374.4	404.6	432.8	459.1	484.6	489.5	43%
CO ₂ / TPES (tCO ₂ per TJ)	40.5	42.1	44.0	43.1	42.0	43.3	42.5	5%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.26	0.3	0.3	0.3	0.3	0.3	0.3	-1%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.18	0.2	0.2	0.2	0.2	0.2	0.2	-4%
CO ₂ / population (tCO ₂ per capita)	1.6	1.7	1.9	2.0	2.2	2.3	2.2	39%
Share of electricity output from fossil fuels	24%	24%	27%	28%	31%	37%	34%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	182	172	178	179	193	234	213	17%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	118	141	155	184	206	199	99%
Population index	100	109	118	126	134	141	143	43%
GDP PPP per population index	100	108	112	121	143	150	145	45%
Energy intensity index - TPES / GDP PPP	100	96	98	95	93	91	91	-9%
Carbon intensity index - CO ₂ / TPES	100	104	109	107	104	107	105	5%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	97.5	712.9	288.4	-	1 098.8	99%
Electricity and heat generation	53.1	93.9	114.5	-	261.6	194%
Other energy industry own use	1.6	32.6	61.3	-	95.5	57%
Manufacturing industries and construction	42.5	92.1	61.4	-	196.0	55%
Transport	-	405.6	17.9	-	423.5	116%
<i>of which: road</i>	-	383.1	13.3	-	396.4	122%
Other	0.3	88.6	33.3	-	122.2	51%
<i>of which: residential</i>	0.3	36.8	27.1	-	64.2	47%
<i>of which: services</i>	-	7.5	4.7	-	12.2	14%
<i>Memo: international marine bunkers</i>	-	42.7	-	-	42.7	116%
<i>Memo: international aviation bunkers</i>	-	29.2	-	-	29.2	235%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	383.1	177.8	14.6	14.6
Main activity prod. elec. and heat - gas	98.5	24.1	3.8	18.4
Manufacturing industries - oil	92.1	68.7	3.5	21.9
Main activity prod. elec. and heat - oil	78.9	36.2	3.0	24.9
Manufacturing industries - gas	61.4	31.4	2.3	27.2
Other energy industry own use - gas	61.3	27.6	2.3	29.5
Non-specified other - oil	51.8	32.6	2.0	31.5
Manufacturing industries - coal	42.5	26.4	1.6	33.1
Residential - oil	36.8	33.6	1.4	34.5
<i>Memo: total CO₂ from fuel combustion</i>	<i>1098.8</i>	<i>553.5</i>	<i>41.9</i>	<i>41.9</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Middle East

Figure 1. CO₂ emissions by fuel

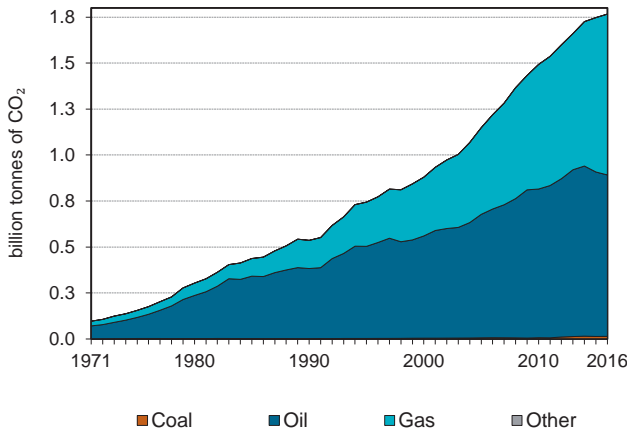


Figure 2. CO₂ emissions by sector

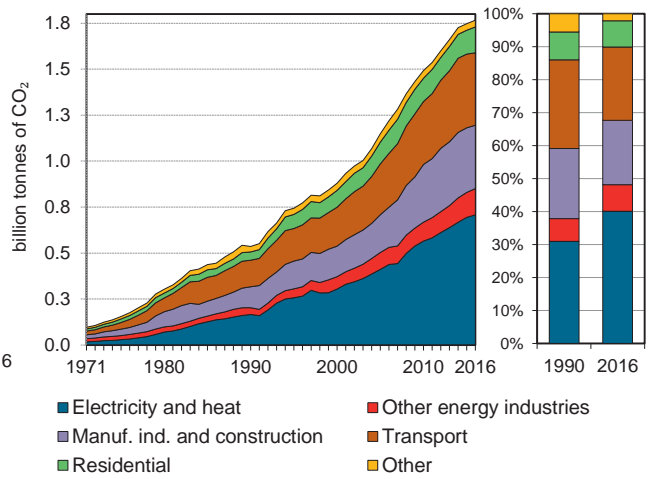


Figure 3. Electricity generation by fuel

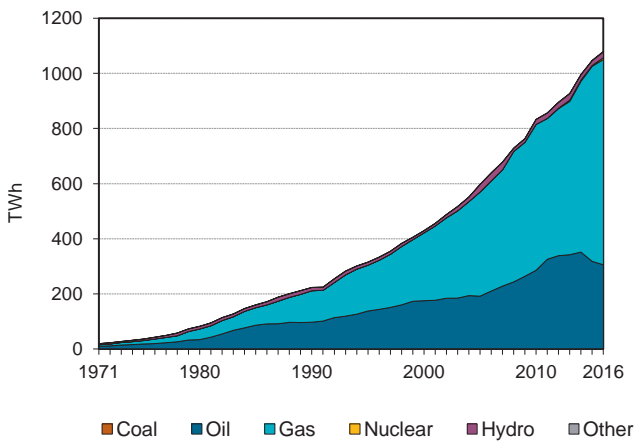


Figure 4. CO₂ from electricity generation: driving factors¹

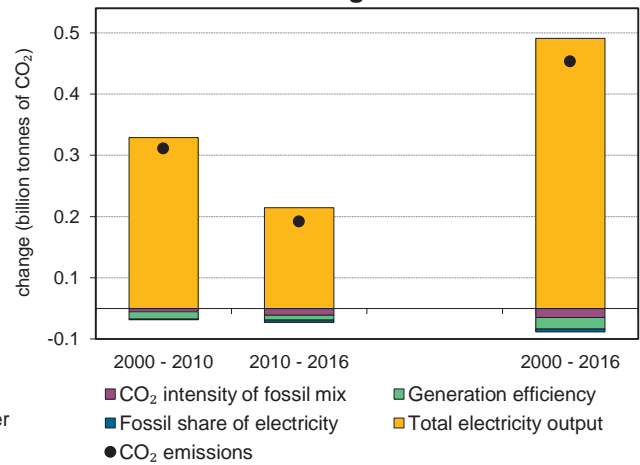


Figure 5. Changes in selected indicators

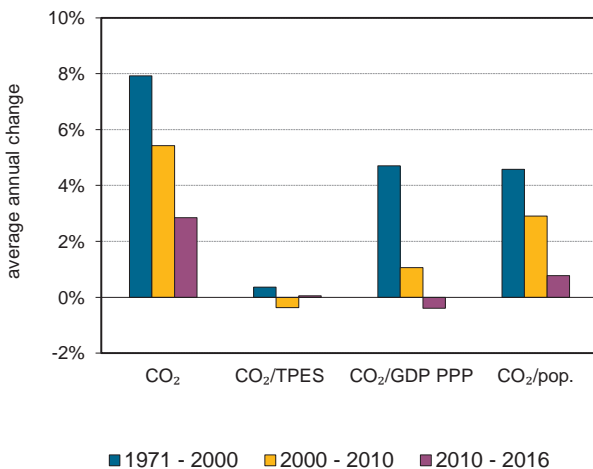
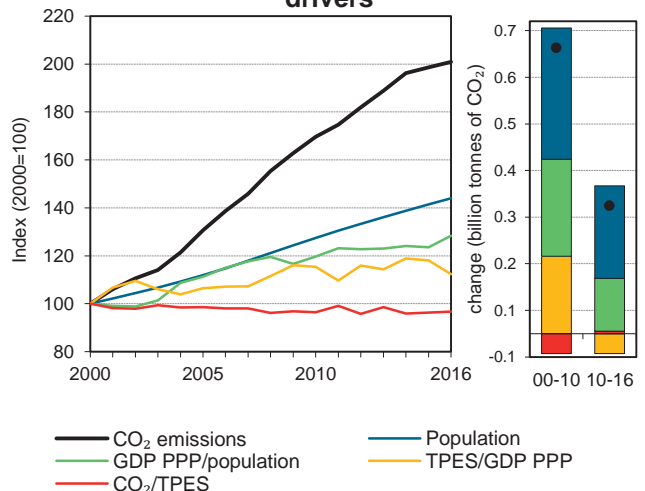


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Middle East

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	536	743.9	879.7	1 148.5	1 492.7	1 747.6	1 766.7	230%
Share of World CO ₂ from fuel combustion	2.6%	3.5%	3.8%	4.2%	4.9%	5.4%	5.5%	
TPES (PJ)	8839	12 841	14 802	19 617	26 058	30 529	30 735	248%
GDP (billion 2010 USD)	848	1 006.0	1 223.2	1 535.9	1 904.6	2 212.5	2 294.3	171%
GDP PPP (billion 2010 USD)	2011.1	2 353.9	2 868.6	3 573.0	4 377.3	5 010.7	5 301.2	164%
Population (millions)	127.5	144.1	161.8	181.0	206.2	228.8	233.0	83%
CO ₂ / TPES (tCO ₂ per TJ)	60.6	57.9	59.4	58.5	57.3	57.2	57.5	-5%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.63	0.7	0.7	0.7	0.8	0.8	0.8	22%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.27	0.3	0.3	0.3	0.3	0.3	0.3	25%
CO ₂ / population (tCO ₂ per capita)	4.2	5.2	5.4	6.3	7.2	7.6	7.6	80%
Share of electricity output from fossil fuels	95%	97%	98%	95%	98%	98%	97%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	742	814	708	689	678	663	655	-12%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	139	164	214	279	326	330	230%
Population index	100	113	127	142	162	179	183	83%
GDP PPP per population index	100	104	112	125	135	139	144	44%
Energy intensity index - TPES / GDP PPP	100	124	117	125	135	139	132	32%
Carbon intensity index - CO ₂ / TPES	100	96	98	97	94	94	95	-5%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	13.7	878.0	875.0	-	1 766.7	230%
Electricity and heat generation	1.8	285.4	420.6	-	707.8	327%
Other energy industry own use	1.1	50.0	91.6	-	142.8	288%
Manufacturing industries and construction	10.8	106.6	227.3	-	344.7	203%
Transport	-	377.9	16.1	-	394.0	173%
<i>of which: road</i>	-	358.8	15.2	-	374.0	162%
Other	0.0	58.1	119.4	-	177.5	137%
<i>of which: residential</i>	0.0	40.7	100.0	-	140.7	213%
<i>of which: services</i>	-	5.5	15.1	-	20.6	99%
<i>Memo: international marine bunkers</i>	-	89.1	-	-	89.1	182%
<i>Memo: international aviation bunkers</i>	-	55.1	-	-	55.1	146%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	358.8	142.8	13.7	13.7
Main activity prod. elec. and heat - gas	321.4	54.6	12.3	26.0
Main activity prod. elec. and heat - oil	255.1	82.0	9.8	35.8
Manufacturing industries - gas	227.3	52.8	8.7	44.5
Manufacturing industries - oil	106.6	60.5	4.1	48.6
Residential - gas	100.0	6.1	3.8	52.4
Unallocated autoproducers - gas	99.2	24.8	3.8	56.2
Other energy industry own use - gas	91.6	13.1	3.5	59.7
Other energy industry own use - oil	50.0	23.2	1.9	61.6
<i>Memo: total CO₂ from fuel combustion</i>	<i>1766.7</i>	<i>536</i>	<i>67.6</i>	<i>67.6</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

G20

Figure 1. CO₂ emissions by fuel

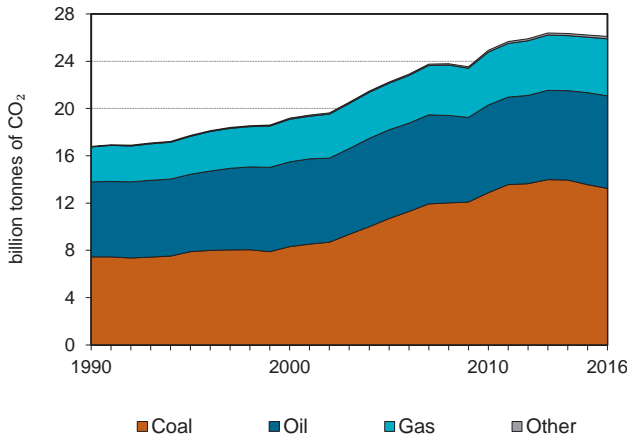


Figure 2. CO₂ emissions by sector

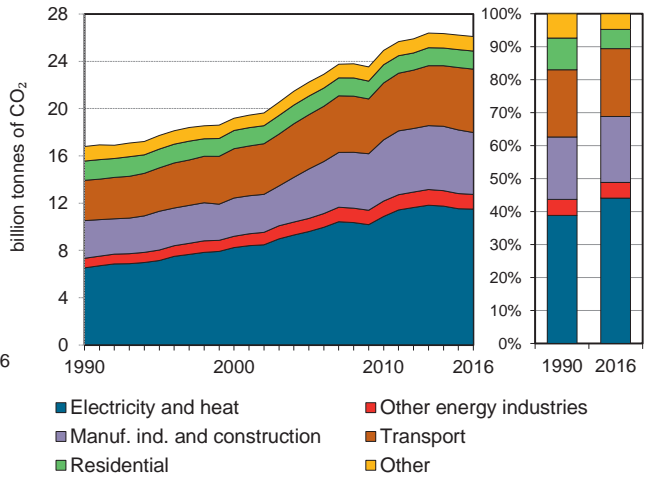


Figure 3. Electricity generation by fuel

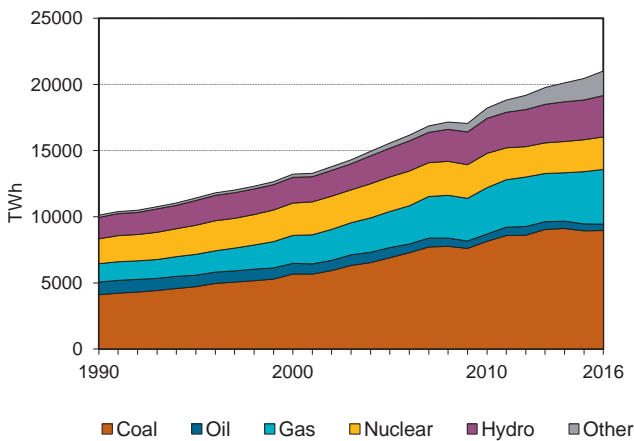


Figure 4. CO₂ from electricity generation: driving factors¹

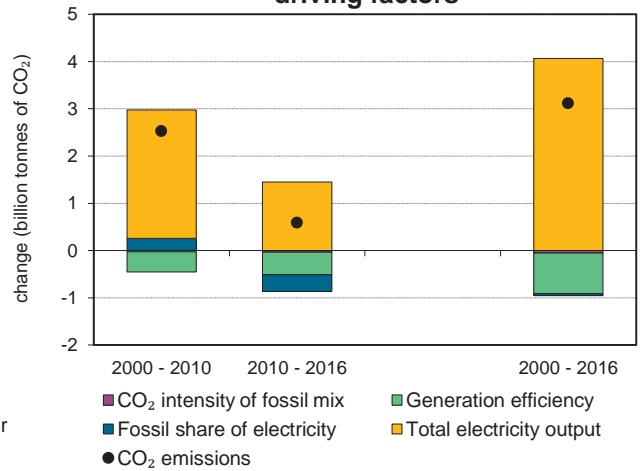


Figure 5. Changes in selected indicators

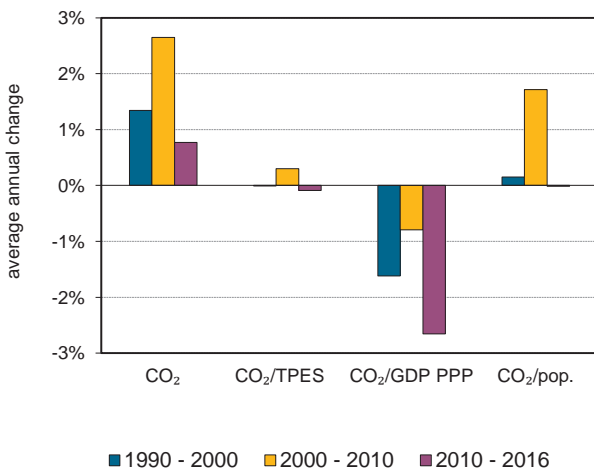
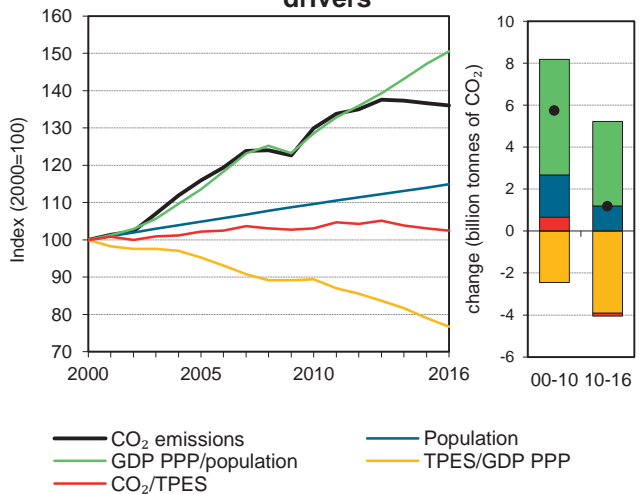


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

G20

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	16791.9	17 724.2	19 185.9	22 237.2	24 922.3	26 220.5	26 099.8	55%
Share of World CO ₂ from fuel combustion	81.8%	82.9%	82.6%	82.2%	81.7%	81.2%	80.8%	
TPES (PJ)	295803	312 760	338 310	383 712	426 385	448 638	448 994	52%
GDP (billion 2010 USD)	33730.1	37 487.3	44 382.1	51 140.7	57 294.1	65 479.9	67 027.7	99%
GDP PPP (billion 2010 USD)	37744.8	42 302.2	50 740.2	60 435.4	71 500.1	85 120.9	87 761.6	133%
Population (millions)	3657.7	3 896.5	4 117.0	4 317.7	4 512.2	4 693.2	4 729.5	29%
CO ₂ / TPES (tCO ₂ per TJ)	56.8	56.7	56.7	58.0	58.5	58.4	58.1	2%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.5	0.5	0.4	0.4	0.4	0.4	0.4	-22%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.45	0.4	0.4	0.4	0.3	0.3	0.3	-33%
CO ₂ / population (tCO ₂ per capita)	4.6	4.5	4.7	5.2	5.5	5.6	5.5	20%
Share of electricity output from fossil fuels	64%	63%	65%	67%	67%	66%	65%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	541	543	552	555	539	513	496	-8%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	106	114	132	148	156	155	55%
Population index	100	107	113	118	123	128	129	29%
GDP PPP per population index	100	105	119	136	154	176	180	80%
Energy intensity index - TPES / GDP PPP	100	94	85	81	76	67	65	-35%
Carbon intensity index - CO ₂ / TPES	100	100	100	102	103	103	102	2%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	13 241.0	7 827.9	4 828.3	202.6	26 099.8	55%
Electricity and heat generation	8 863.0	426.5	2 067.5	140.9	11 497.9	76%
Other energy industry own use	289.7	518.4	433.1	1.3	1 242.6	53%
Manufacturing industries and construction	3 516.0	747.9	924.1	48.8	5 236.7	64%
Transport	0.1	5 169.5	191.7	-	5 361.3	57%
<i>of which: road</i>	-	4 598.0	64.7	-	4 662.6	67%
Other	572.3	965.6	1 211.9	11.6	2 761.4	-3%
<i>of which: residential</i>	272.0	456.5	801.9	-	1 530.4	-6%
<i>of which: services</i>	128.1	212.2	390.5	6.2	736.9	3%
<i>Memo: international marine bunkers</i>	-	386.8	0.0	-	386.8	45%
<i>Memo: international aviation bunkers</i>	-	384.7	-	-	384.7	109%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	8120.5	4225.6	21.5	21.5
Road - oil	4598.0	2788.1	12.2	33.6
Manufacturing industries - coal	3516.0	1716.0	9.3	42.9
Main activity prod. elec. and heat - gas	1673.6	745.2	4.4	47.3
Manufacturing industries - gas	924.1	686.8	2.4	49.8
Residential - gas	801.9	596.3	2.1	51.9
Manufacturing industries - oil	747.9	778.2	2.0	53.9
Unallocated autoproducers - coal	742.5	373.5	2.0	55.8
Other transport - oil	571.5	462.7	1.5	57.3
<i>Memo: total CO₂ from fuel combustion</i>	<i>26099.8</i>	<i>16791.9</i>	<i>69.0</i>	<i>69.0</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

CO₂ EMISSIONS STATISTICS AND INDICATORS

COUNTRIES

Albania

Figure 1. CO₂ emissions by fuel

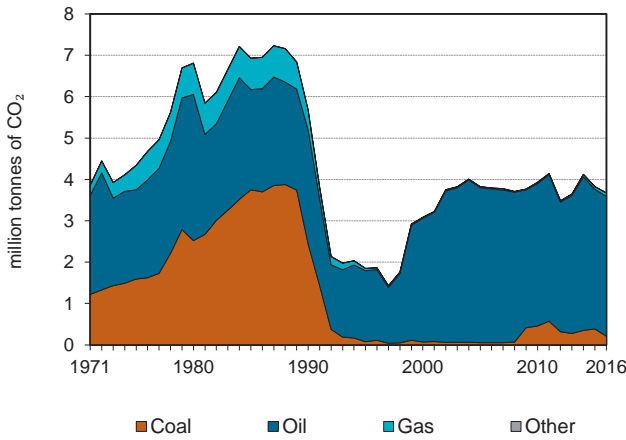


Figure 2. CO₂ emissions by sector

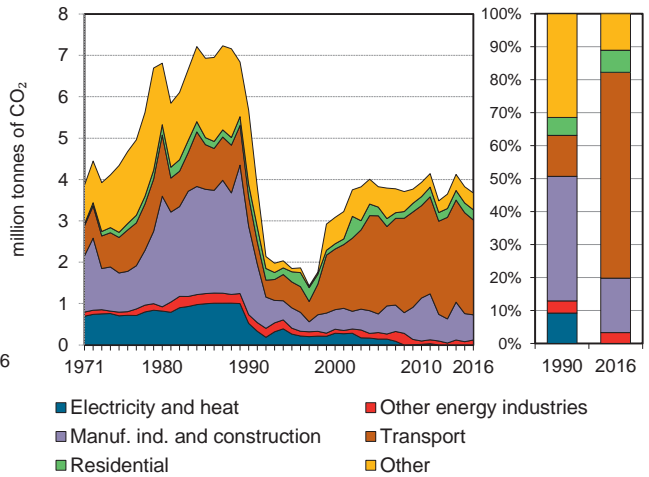


Figure 3. Electricity generation by fuel

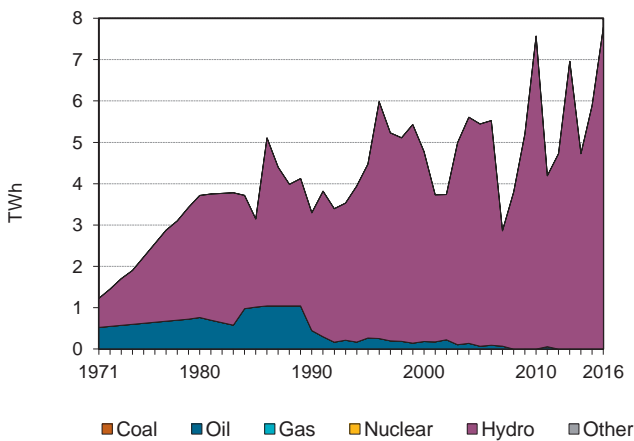


Figure 4. CO₂ from electricity generation: driving factors¹

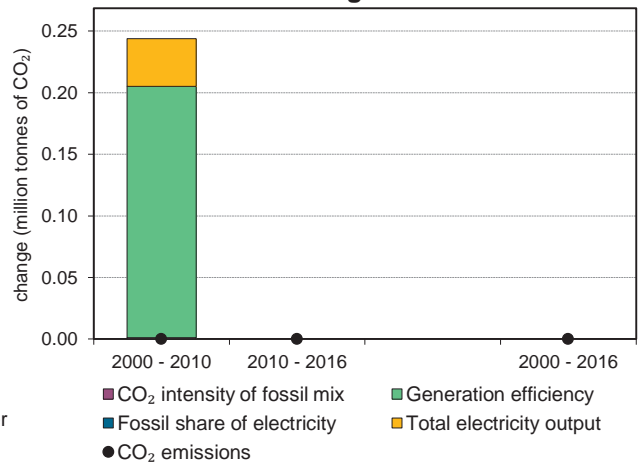


Figure 5. Changes in selected indicators

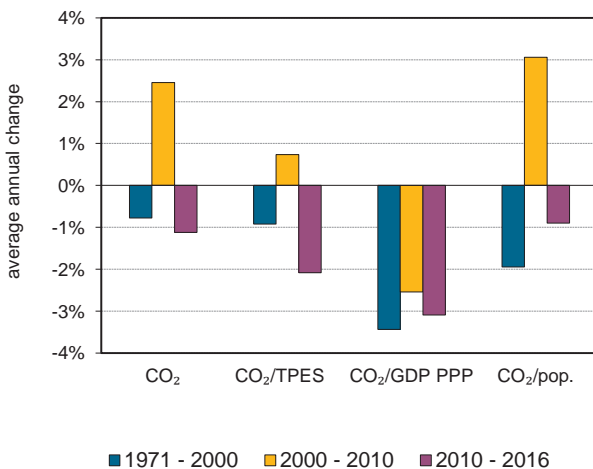
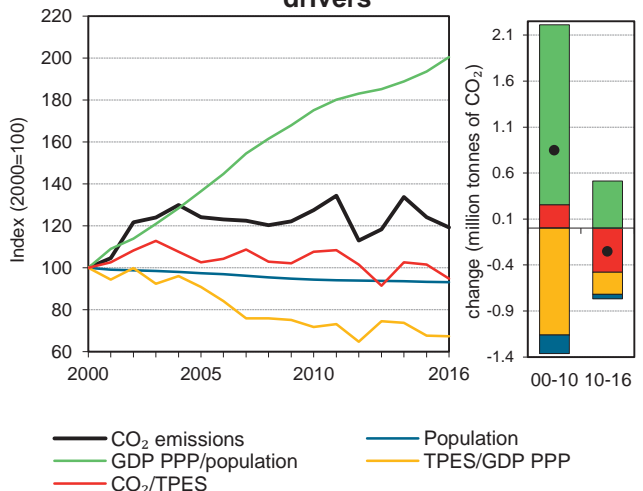


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Albania

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	5.7	1.8	3.1	3.8	3.9	3.8	3.7	-35%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	112	56	75	91	89	92	94	-16%
GDP (billion 2010 USD)	6.2	5.4	7.0	9.3	11.9	13.1	13.6	119%
GDP PPP (billion 2010 USD)	15.1	13.2	17.0	22.6	28.1	30.7	31.7	110%
Population (millions)	3.3	3.2	3.1	3.0	2.9	2.9	2.9	-13%
CO ₂ / TPES (tCO ₂ per TJ)	50.7	33.2	41.1	42.2	44.2	41.7	39.0	-23%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.92	0.3	0.4	0.4	0.3	0.3	0.3	-70%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.38	0.1	0.2	0.2	0.1	0.1	0.1	-69%
CO ₂ / population (tCO ₂ per capita)	1.7	0.6	1.0	1.3	1.3	1.3	1.3	-26%
Share of electricity output from fossil fuels	14%	6%	4%	1%	0%	0%	0%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	150	55	52	26	2	-	-	-100%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	33	54	67	69	67	65	-35%
Population index	100	97	94	92	89	88	87	-13%
GDP PPP per population index	100	91	120	164	210	232	241	141%
Energy intensity index - TPES / GDP PPP	100	57	59	54	43	40	40	-60%
Carbon intensity index - CO ₂ / TPES	100	66	81	83	87	82	77	-23%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.2	3.4	0.1	-	3.7	-35%
Electricity and heat generation	-	-	-	-	-	-100%
Other energy industry own use	-	0.1	0.1	-	0.1	-43%
Manufacturing industries and construction	0.2	0.4	0.0	-	0.6	-72%
Transport	-	2.3	-	-	2.3	224%
<i>of which: road</i>	-	2.2	-	-	2.2	208%
Other	0.0	0.6	-	-	0.7	-69%
<i>of which: residential</i>	-	0.2	-	-	0.2	-19%
<i>of which: services</i>	0.0	0.1	-	-	0.1	x
<i>Memo: international marine bunkers</i>	-	0.1	-	-	0.1	x
<i>Memo: international aviation bunkers</i>	-	0.0	-	-	0.0	x

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	2.2	0.7	24.4	24.4
Manufacturing industries - oil	0.4	1.0	4.4	28.8
Non-specified other - oil	0.4	-	4.4	33.2
Residential - oil	0.2	0.3	2.8	35.9
Manufacturing industries - coal	0.2	0.7	2.2	38.1
Other transport - oil	0.1	-	1.3	39.3
Other energy industry own use - oil	0.1	0.2	0.7	40.0
Other energy industry own use - gas	0.1	-	0.7	40.7
Manufacturing industries - gas	0.0	0.4	0.3	41.0
<i>Memo: total CO₂ from fuel combustion</i>	3.7	5.7	41.1	41.1

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Algeria

Figure 1. CO₂ emissions by fuel

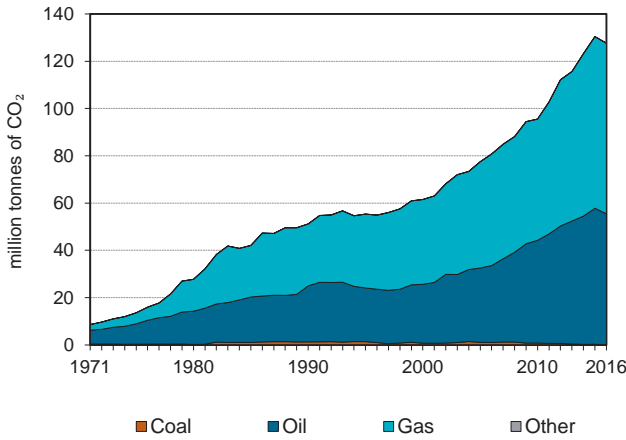


Figure 2. CO₂ emissions by sector

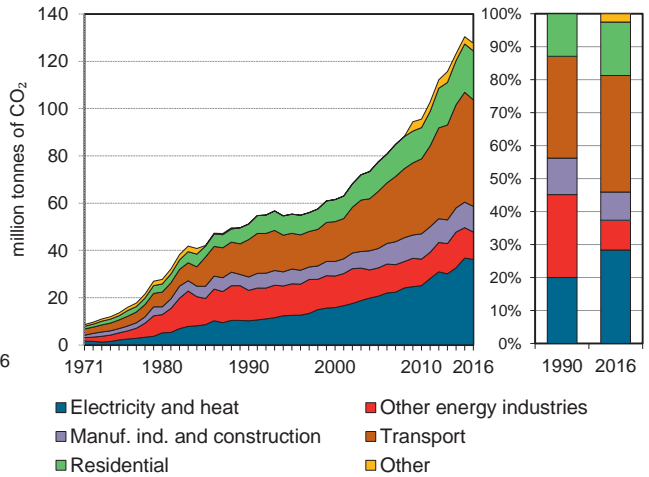


Figure 3. Electricity generation by fuel

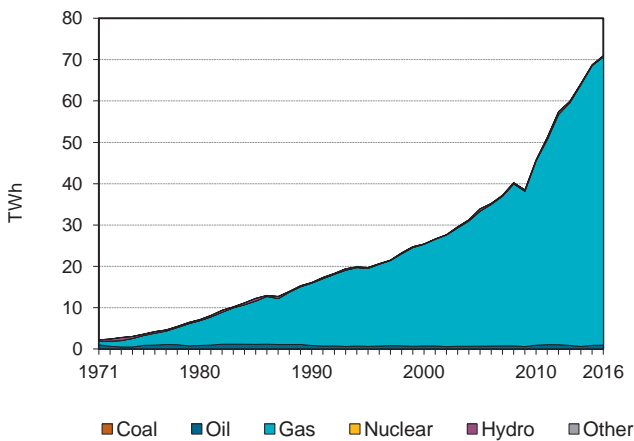


Figure 4. CO₂ from electricity generation: driving factors¹

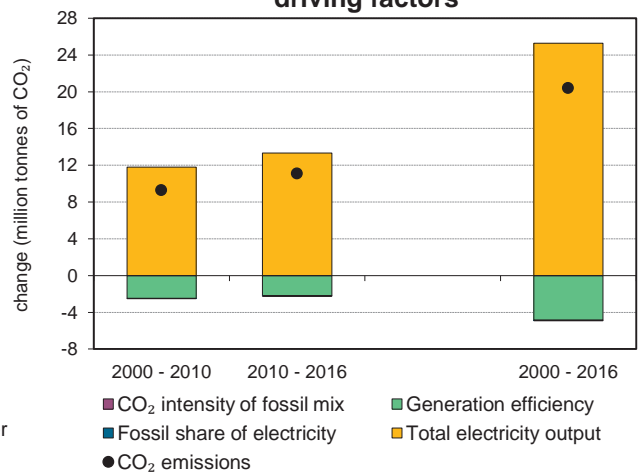


Figure 5. Changes in selected indicators

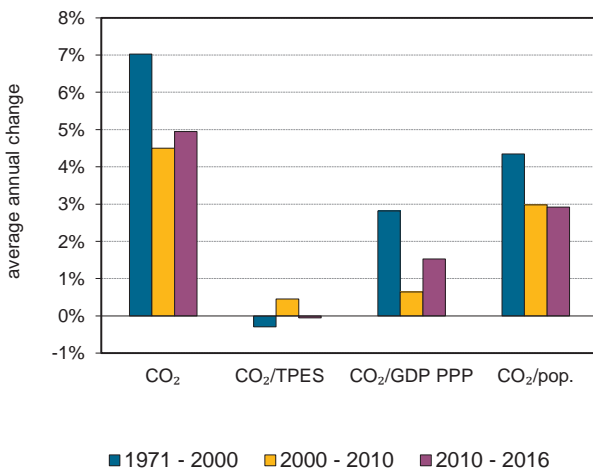
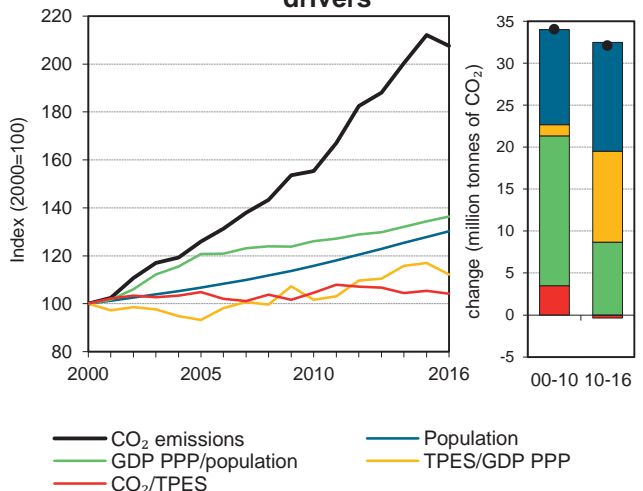


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Algeria

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	51.2	55.3	61.5	77.5	95.5	130.4	127.6	149%
Share of World CO ₂ from fuel combustion	0.3%	0.3%	0.3%	0.3%	0.3%	0.4%	0.4%	
TPES (PJ)	929	1 015	1 130	1 358	1 679	2 273	2 250	142%
GDP (billion 2010 USD)	92	93.2	110.4	142.3	161.2	189.8	196.8	114%
GDP PPP (billion 2010 USD)	259.9	263.2	312.0	401.9	455.5	536.2	553.8	113%
Population (millions)	25.9	28.9	31.2	33.3	36.1	39.9	40.6	57%
CO ₂ / TPES (tCO ₂ per TJ)	55.1	54.5	54.4	57.1	56.9	57.4	56.7	3%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.56	0.6	0.6	0.5	0.6	0.7	0.6	17%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	17%
CO ₂ / population (tCO ₂ per capita)	2	1.9	2.0	2.3	2.6	3.3	3.1	59%
Share of electricity output from fossil fuels	99%	99%	100%	98%	100%	100%	100%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	635	636	623	609	549	535	509	-20%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	108	120	151	187	255	249	149%
Population index	100	112	120	128	139	154	157	57%
GDP PPP per population index	100	91	100	120	126	134	136	36%
Energy intensity index - TPES / GDP PPP	100	108	101	94	103	119	114	14%
Carbon intensity index - CO ₂ / TPES	100	99	99	104	103	104	103	3%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	55.5	72.2	-	127.6	149%
Electricity and heat generation	-	1.3	34.9	-	36.2	254%
Other energy industry own use	-	2.6	9.0	-	11.6	-10%
Manufacturing industries and construction	-	2.5	8.4	-	10.9	92%
Transport	-	43.4	1.6	-	45.1	185%
<i>of which: road</i>	-	42.8	-	-	42.8	183%
Other	-	5.6	18.3	-	23.9	263%
<i>of which: residential</i>	-	4.5	16.2	-	20.7	214%
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	0.7	-	-	0.7	-45%
<i>Memo: international aviation bunkers</i>	-	1.5	-	-	1.5	33%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	42.8	15.1	17.6	17.6
Main activity prod. elec. and heat - gas	32.5	9.3	13.4	31.0
Residential - gas	16.2	2.5	6.7	37.7
Other energy industry own use - gas	9.0	11.1	3.7	41.4
Manufacturing industries - gas	8.4	2.7	3.5	44.8
Residential - oil	4.5	4.1	1.8	46.7
Other energy industry own use - oil	2.6	1.8	1.1	47.8
Manufacturing industries - oil	2.5	1.7	1.0	48.8
Unallocated autoproducers - gas	2.4	-	1.0	49.8
<i>Memo: total CO₂ from fuel combustion</i>	<i>127.6</i>	<i>51.2</i>	<i>52.6</i>	<i>52.6</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Angola

Figure 1. CO₂ emissions by fuel

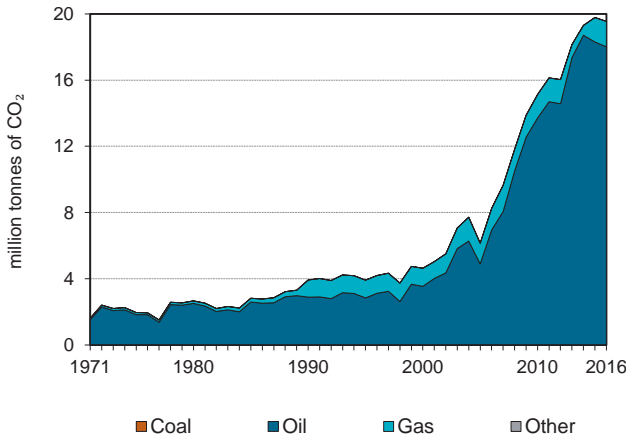


Figure 2. CO₂ emissions by sector

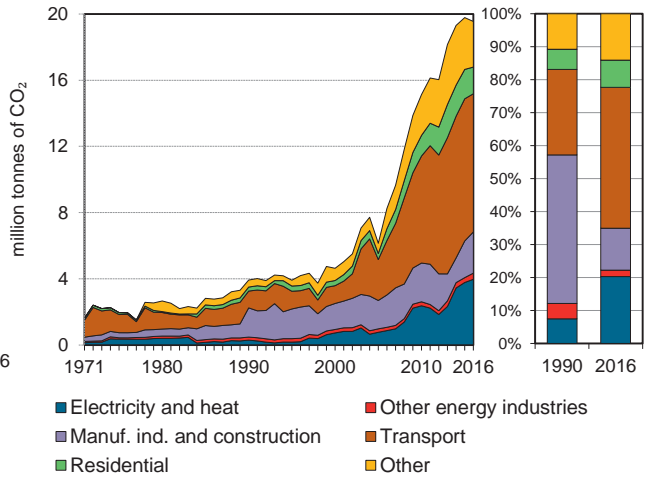


Figure 3. Electricity generation by fuel

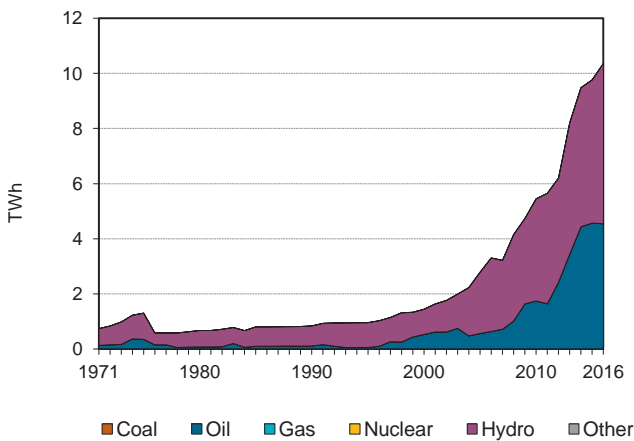


Figure 4. CO₂ from electricity generation: driving factors¹

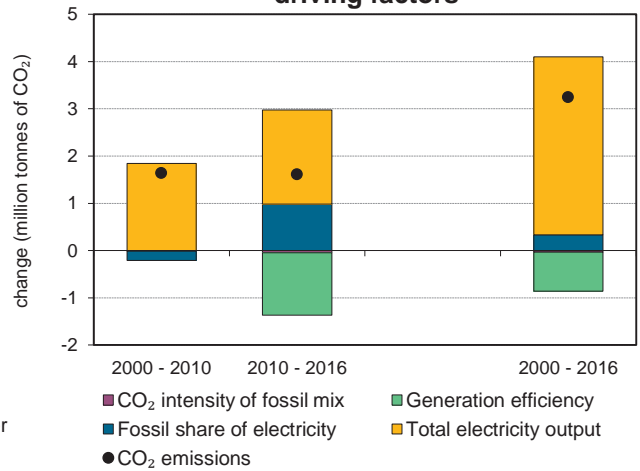


Figure 5. Changes in selected indicators

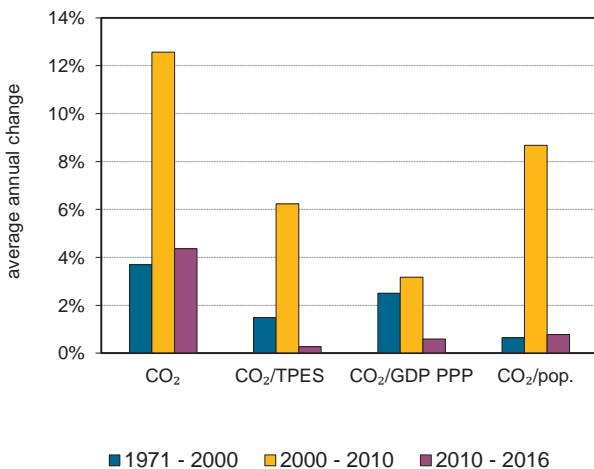
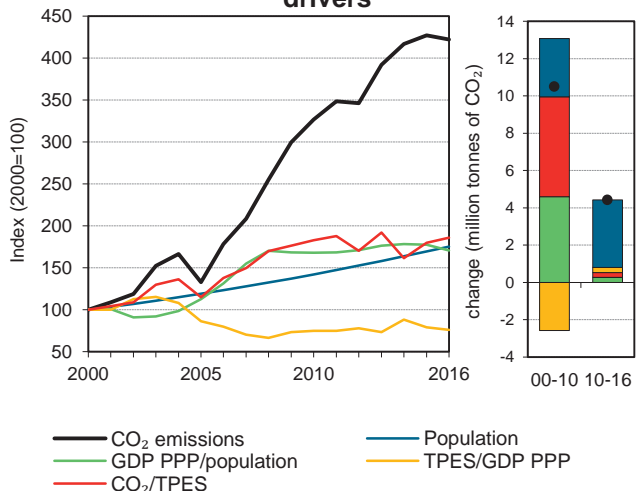


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Angola

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	3.9	3.9	4.6	6.1	15.1	19.8	19.6	398%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	
TPES (PJ)	246	266	301	347	538	716	684	178%
GDP (billion 2010 USD)	32	25.3	34.5	46.2	82.5	103.9	103.9	225%
GDP PPP (billion 2010 USD)	52.4	41.5	56.5	75.7	135.0	170.1	169.0	222%
Population (millions)	12.2	14.3	16.4	19.6	23.4	27.9	28.8	137%
CO ₂ / TPES (tCO ₂ per TJ)	15.9	14.7	15.4	17.7	28.2	27.6	28.6	80%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.12	0.2	0.1	0.1	0.2	0.2	0.2	53%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.08	0.1	0.1	0.1	0.1	0.1	0.1	55%
CO ₂ / population (tCO ₂ per capita)	0.3	0.3	0.3	0.3	0.6	0.7	0.7	111%
Share of electricity output from fossil fuels	14%	6%	37%	20%	32%	47%	44%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	347	179	504	275	435	387	383	11%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	100	118	157	386	504	498	398%
Population index	100	117	135	161	192	229	237	137%
GDP PPP per population index	100	68	80	90	134	142	136	36%
Energy intensity index - TPES / GDP PPP	100	136	113	98	85	90	86	-14%
Carbon intensity index - CO ₂ / TPES	100	92	97	111	177	174	180	80%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	18.0	1.5	-	19.6	398%
Electricity and heat generation	-	4.0	-	-	4.0	+
Other energy industry own use	-	0.2	0.2	-	0.4	100%
Manufacturing industries and construction	-	1.1	1.4	-	2.5	41%
Transport	-	8.4	-	-	8.4	721%
<i>of which: road</i>	-	7.7	-	-	7.7	661%
Other	-	4.4	-	-	4.4	559%
<i>of which: residential</i>	-	1.6	-	-	1.6	566%
<i>of which: services</i>	-	2.7	-	-	2.7	591%
<i>Memo: international marine bunkers</i>	-	1.1	-	-	1.1	+
<i>Memo: international aviation bunkers</i>	-	0.5	-	-	0.5	-52%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	7.7	1.0	5.2	5.2
Main activity prod. elec. and heat - oil	3.3	0.2	2.2	7.5
Non-specified other - oil	2.8	0.4	1.9	9.3
Residential - oil	1.6	0.2	1.1	10.4
Manufacturing industries - gas	1.4	1.0	0.9	11.3
Manufacturing industries - oil	1.1	0.7	0.7	12.1
Unallocated autoproducers - oil	0.6	0.1	0.4	12.5
Other transport - oil	0.6	-	0.4	12.9
Other energy industry own use - oil	0.2	0.2	0.1	13.1
<i>Memo: total CO₂ from fuel combustion</i>	<i>19.6</i>	<i>3.9</i>	<i>13.2</i>	<i>13.2</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Argentina

Figure 1. CO₂ emissions by fuel

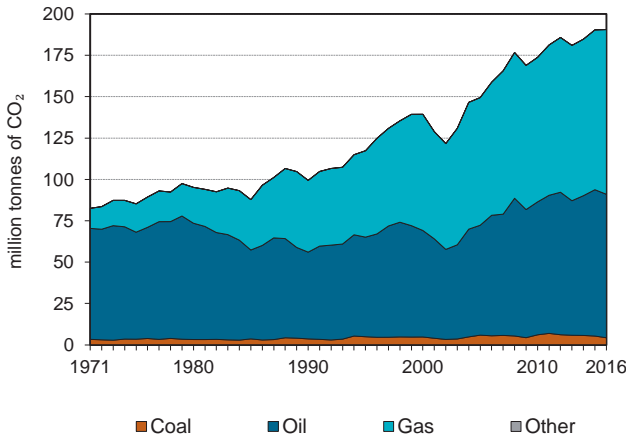


Figure 2. CO₂ emissions by sector

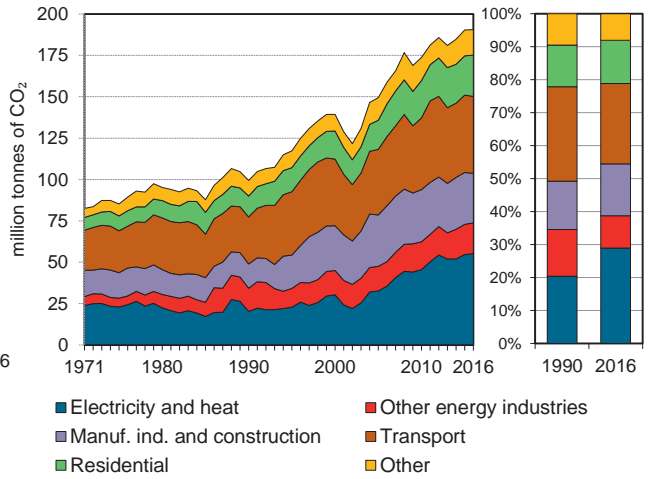


Figure 3. Electricity generation by fuel

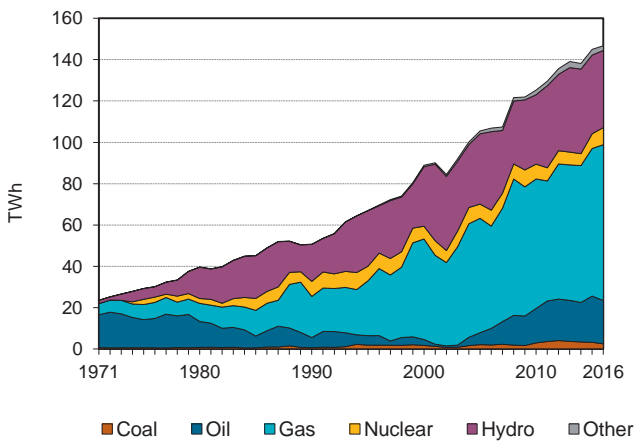


Figure 4. CO₂ from electricity generation: driving factors¹

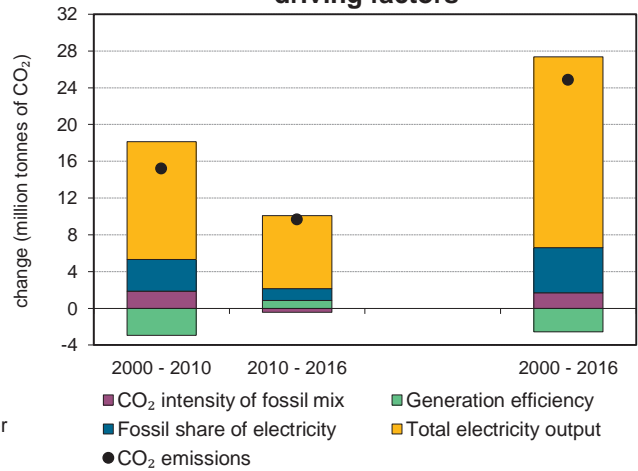


Figure 5. Changes in selected indicators

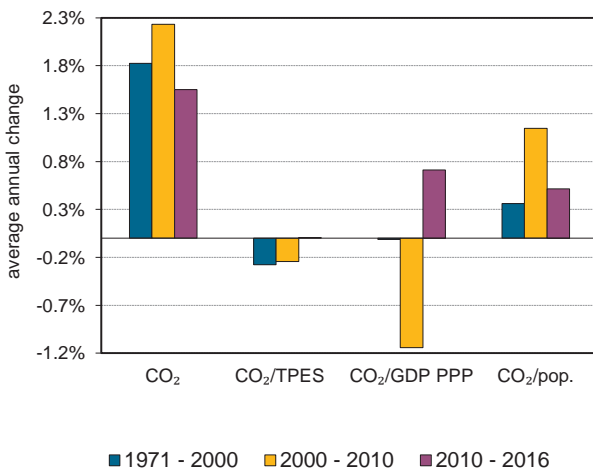
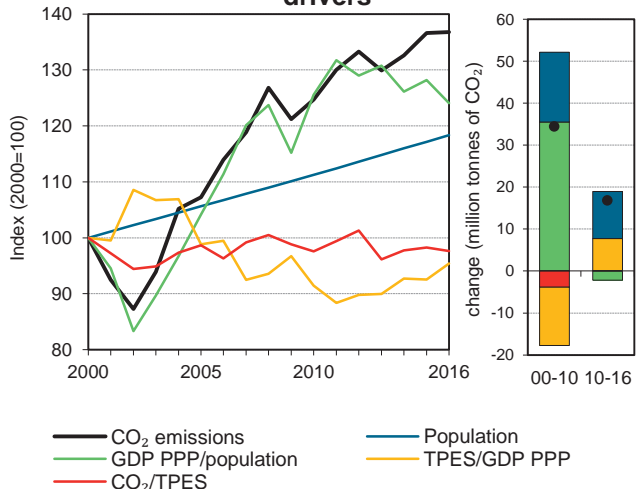


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Argentina

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	99.4	117.3	139.4	149.5	173.8	190.4	190.6	92%
Share of World CO ₂ from fuel combustion	0.5%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	
TPES (PJ)	1929	2 263	2 578	2 802	3 294	3 583	3 611	87%
GDP (billion 2010 USD)	194.4	267.0	303.2	333.6	423.6	455.5	445.0	129%
GDP PPP (billion 2010 USD)	346.8	476.4	541.0	595.2	755.8	812.6	794.3	129%
Population (millions)	32.7	35.0	37.1	39.1	41.2	43.4	43.8	34%
CO ₂ / TPES (tCO ₂ per TJ)	51.5	51.8	54.1	53.3	52.8	53.1	52.8	2%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.51	0.4	0.5	0.4	0.4	0.4	0.4	-16%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.29	0.2	0.3	0.3	0.2	0.2	0.2	-16%
CO ₂ / population (tCO ₂ per capita)	3	3.4	3.8	3.8	4.2	4.4	4.3	43%
Share of electricity output from fossil fuels	50%	49%	60%	60%	66%	67%	67%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	400	341	341	310	364	377	376	-6%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	118	140	150	175	192	192	92%
Population index	100	107	113	120	126	133	134	34%
GDP PPP per population index	100	128	138	143	173	177	171	71%
Energy intensity index - TPES / GDP PPP	100	85	86	85	78	79	82	-18%
Carbon intensity index - CO ₂ / TPES	100	101	105	103	102	103	102	2%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	4.3	86.7	99.6	-	190.6	92%
Electricity and heat generation	3.1	15.5	36.6	-	55.2	172%
Other energy industry own use	-	3.9	14.6	-	18.6	32%
Manufacturing industries and construction	1.2	12.4	16.3	-	30.0	105%
Transport	-	38.5	8.0	-	46.5	63%
<i>of which: road</i>	-	35.6	5.6	-	41.2	56%
Other	-	16.3	24.0	-	40.4	83%
<i>of which: residential</i>	-	3.7	21.3	-	25.0	98%
<i>of which: services</i>	-	1.0	2.7	-	3.8	-22%
<i>Memo: international marine bunkers</i>	-	2.2	-	-	2.2	-1%
<i>Memo: international aviation bunkers</i>	-	2.9	-	-	2.9	x

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	35.6	25.9	9.3	9.3
Main activity prod. elec. and heat - gas	31.2	10.5	8.2	17.5
Residential - gas	21.3	8.5	5.6	23.1
Manufacturing industries - gas	16.3	9.8	4.3	27.4
Main activity prod. elec. and heat - oil	14.8	4.6	3.9	31.2
Other energy industry own use - gas	14.6	8.9	3.8	35.1
Non-specified other - oil	12.7	5.9	3.3	38.4
Manufacturing industries - oil	12.4	3.9	3.3	41.7
Road - gas	5.6	0.4	1.5	43.1
<i>Memo: total CO₂ from fuel combustion</i>	<i>190.6</i>	<i>99.4</i>	<i>50.0</i>	<i>50.0</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Armenia

Figure 1. CO₂ emissions by fuel

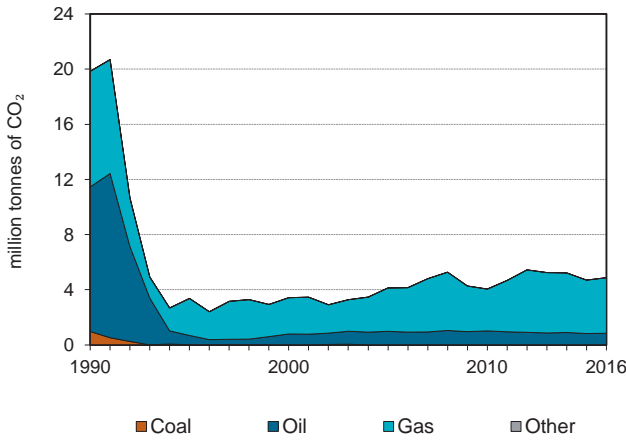


Figure 2. CO₂ emissions by sector

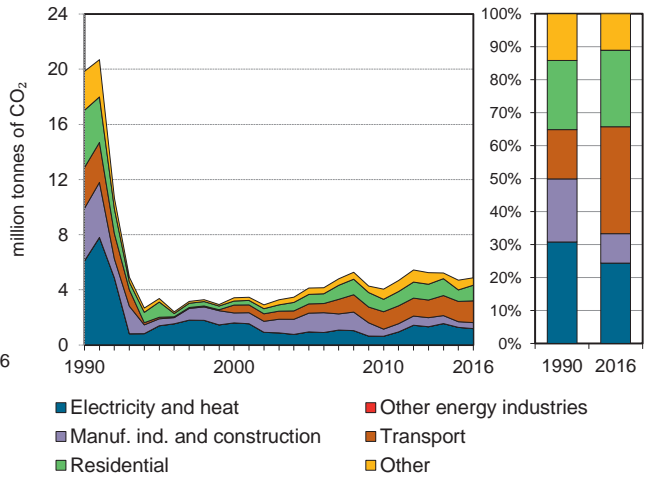


Figure 3. Electricity generation by fuel

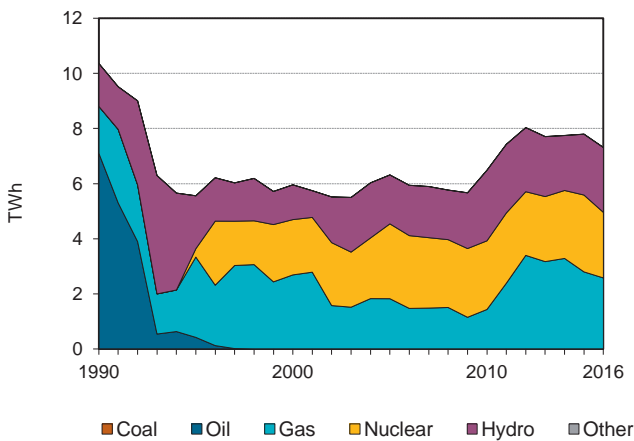


Figure 4. CO₂ from electricity generation: driving factors¹

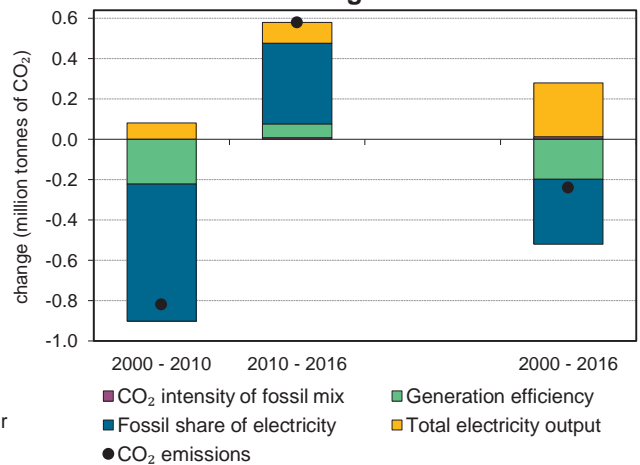


Figure 5. Changes in selected indicators

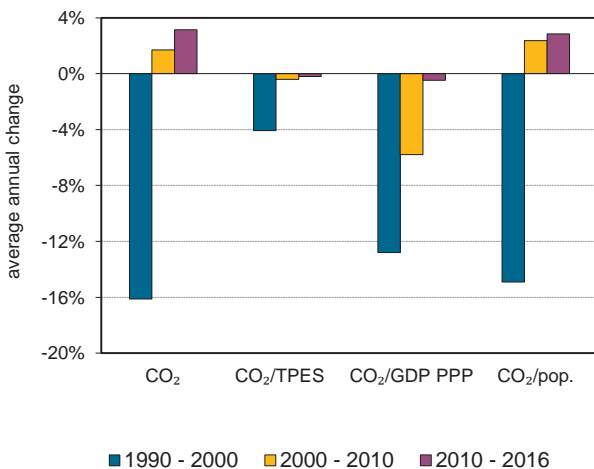
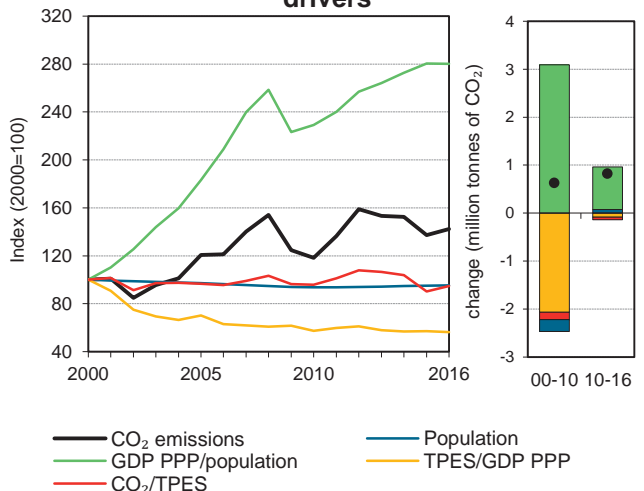


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Armenia

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	19.9	3.4	3.4	4.1	4.0	4.7	4.9	-75%
Share of World CO ₂ from fuel combustion	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	323	69	84	105	104	128	127	-61%
GDP (billion 2010 USD)	6.4	3.4	4.3	7.7	9.3	11.5	11.5	81%
GDP PPP (billion 2010 USD)	13	6.9	8.8	15.6	18.9	23.4	23.5	81%
Population (millions)	3.5	3.2	3.1	3.0	2.9	2.9	2.9	-17%
CO ₂ / TPES (tCO ₂ per TJ)	61.5	48.9	40.6	39.3	38.9	36.6	38.5	-37%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	3.12	1.0	0.8	0.5	0.4	0.4	0.4	-86%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	1.53	0.5	0.4	0.3	0.2	0.2	0.2	-86%
CO ₂ / population (tCO ₂ per capita)	5.6	1.0	1.1	1.4	1.4	1.6	1.7	-70%
Share of electricity output from fossil fuels	85%	60%	45%	29%	22%	36%	35%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	500	213	239	132	93	164	162	-68%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	17	17	21	20	24	25	-75%
Population index	100	91	87	84	81	82	83	-17%
GDP PPP per population index	100	58	78	143	179	219	219	119%
Energy intensity index - TPES / GDP PPP	100	40	39	27	22	22	22	-78%
Carbon intensity index - CO ₂ / TPES	100	80	66	64	63	59	63	-37%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.0	0.8	4.0	-	4.9	-75%
Electricity and heat generation	-	-	1.2	-	1.2	-81%
Other energy industry own use	-	-	-	-	-	-
Manufacturing industries and construction	-	0.1	0.4	-	0.4	-89%
Transport	-	0.7	0.9	-	1.6	-47%
<i>of which: road</i>	-	0.7	0.9	-	1.6	-47%
Other	0.0	0.1	1.6	-	1.7	-76%
<i>of which: residential</i>	-	0.0	1.1	-	1.1	-73%
<i>of which: services</i>	0.0	0.0	0.3	-	0.3	-87%
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.1	-	-	0.1	-77%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - gas	1.2	1.9	13.7	13.7
Residential - gas	1.1	2.7	13.1	26.8
Road - gas	0.9	-	10.5	37.3
Road - oil	0.7	3.0	7.8	45.1
Non-specified other - gas	0.4	1.5	5.0	50.1
Manufacturing industries - gas	0.4	2.3	4.3	54.4
Non-specified other - oil	0.1	1.3	1.2	55.5
Manufacturing industries - oil	0.1	1.5	0.7	56.3
Non-specified other sectors - coal	0.0	-	0.1	56.3
<i>Memo: total CO₂ from fuel combustion</i>	4.9	19.9	56.3	56.3

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Australia

Figure 1. CO₂ emissions by fuel

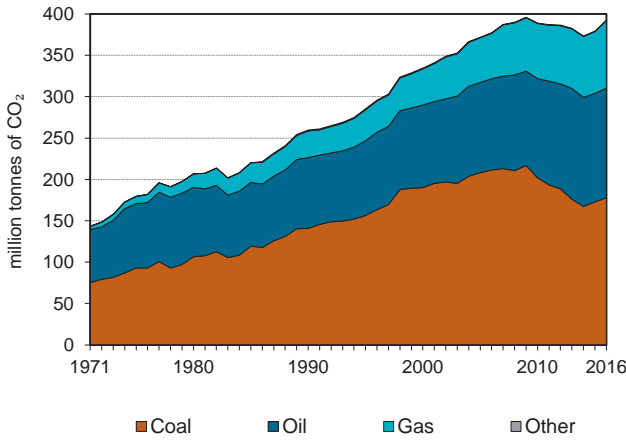


Figure 2. CO₂ emissions by sector

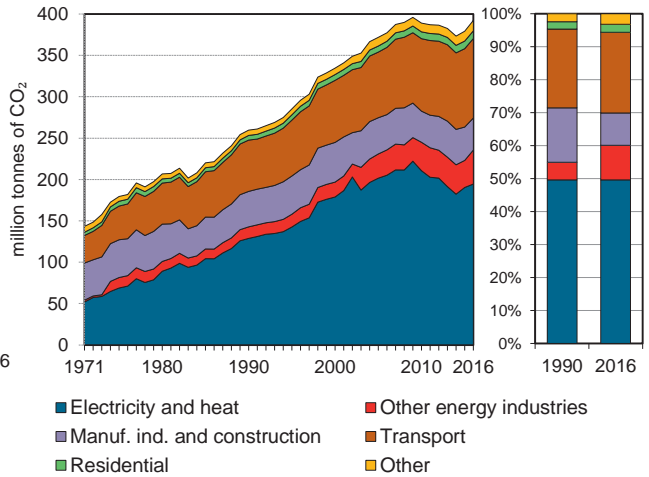


Figure 3. Electricity generation by fuel

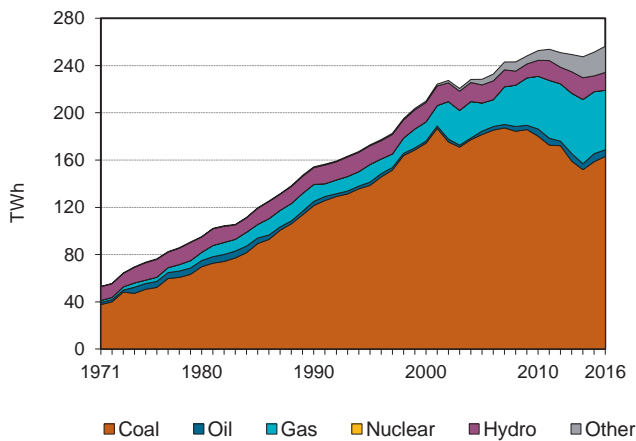


Figure 4. CO₂ from electricity generation: driving factors¹

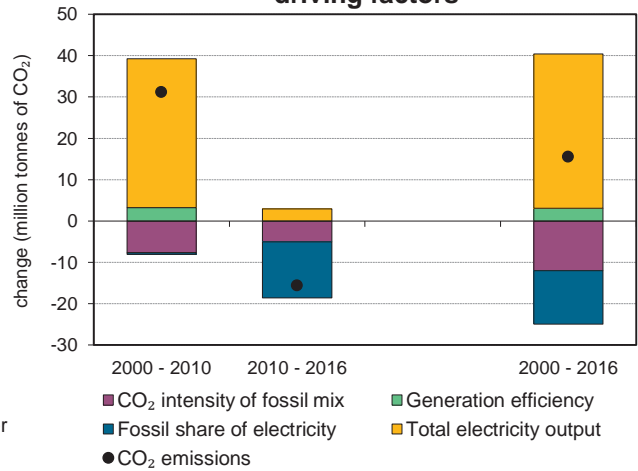


Figure 5. Changes in selected indicators

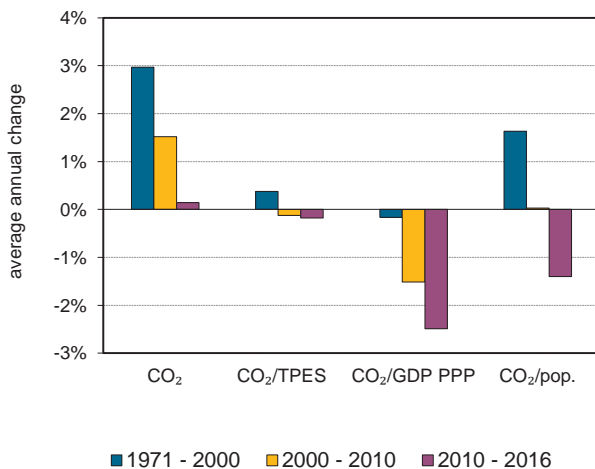
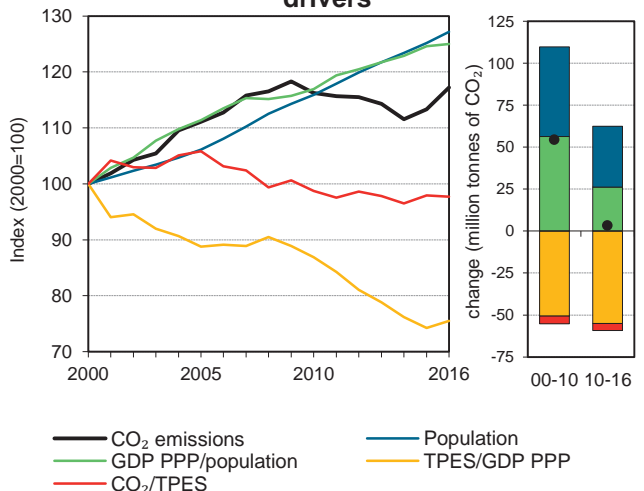


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Australia

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	259.7	285.3	334.6	371.9	389.1	379.3	392.4	51%
Share of World CO ₂ from fuel combustion	1.3%	1.3%	1.4%	1.4%	1.3%	1.2%	1.2%	
TPES (PJ)	3606	3 873	4 526	4 751	5 330	5 239	5 432	51%
GDP (billion 2010 USD)	675.3	791.3	957.4	1 131.6	1 297.3	1 493.1	1 522.4	125%
GDP PPP (billion 2010 USD)	490.3	574.6	695.2	821.7	942.0	1 084.2	1 105.4	125%
Population (millions)	17.3	18.2	19.3	20.5	22.3	24.1	24.5	42%
CO ₂ / TPES (tCO ₂ per TJ)	72	73.7	73.9	78.3	73.0	72.4	72.2	0%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.39	0.4	0.4	0.3	0.3	0.3	0.3	-33%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.53	0.5	0.5	0.5	0.4	0.4	0.4	-33%
CO ₂ / population (tCO ₂ per capita)	15	15.7	17.4	18.2	17.4	15.7	16.0	7%
Share of electricity output from fossil fuels	90%	90%	92%	91%	91%	87%	86%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	833	825	852	882	833	757	759	-9%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	110	129	143	150	146	151	51%
Population index	100	105	112	118	129	140	142	42%
GDP PPP per population index	100	111	127	142	149	158	159	59%
Energy intensity index - TPES / GDP PPP	100	92	89	79	77	66	67	-33%
Carbon intensity index - CO ₂ / TPES	100	102	103	109	101	101	100	0%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	177.7	132.8	81.3	0.6	392.4	51%
Electricity and heat generation	162.4	3.9	28.2	-	194.5	51%
Other energy industry own use	5.2	12.0	23.9	-	41.1	194%
Manufacturing industries and construction	10.0	11.2	17.0	0.6	38.7	-10%
Transport	-	95.4	0.7	-	96.1	55%
<i>of which: road</i>	-	80.3	0.2	-	80.5	46%
Other	0.0	10.4	11.4	-	21.9	82%
<i>of which: residential</i>	0.0	0.9	8.4	-	9.3	64%
<i>of which: services</i>	0.0	2.4	2.9	-	5.4	82%
<i>Memo: international marine bunkers</i>	-	2.1	-	-	2.1	-5%
<i>Memo: international aviation bunkers</i>	-	12.3	-	-	12.3	183%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	162.4	115.0	29.2	29.2
Road - oil	80.3	55.1	14.4	43.6
Other energy industry own use - gas	23.9	4.8	4.3	47.9
Main activity prod. elec. and heat - gas	21.7	7.1	3.9	51.8
Manufacturing industries - gas	17.0	13.1	3.1	54.8
Other transport - oil	15.1	6.7	2.7	57.5
Other energy industry own use - oil	12.0	6.6	2.1	59.7
Manufacturing industries - oil	11.2	9.0	2.0	61.7
Manufacturing industries - coal	10.0	19.6	1.8	63.5
<i>Memo: total CO₂ from fuel combustion</i>	<i>392.4</i>	<i>259.7</i>	<i>70.4</i>	<i>70.4</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Austria

Figure 1. CO₂ emissions by fuel

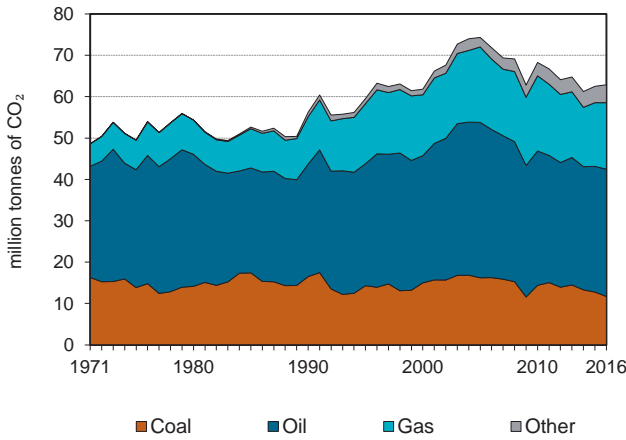


Figure 2. CO₂ emissions by sector

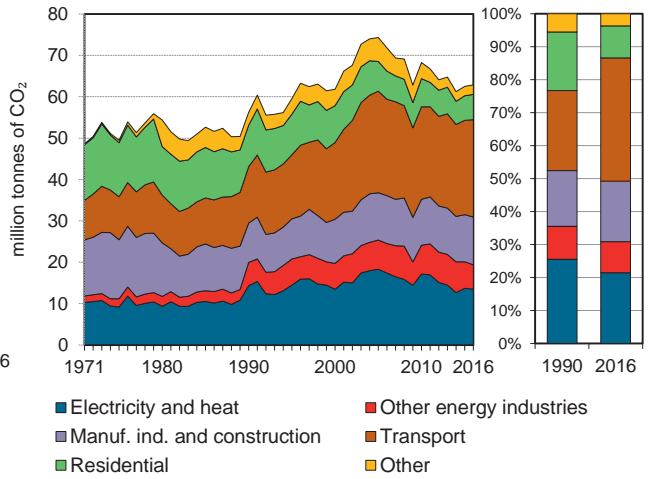


Figure 3. Electricity generation by fuel

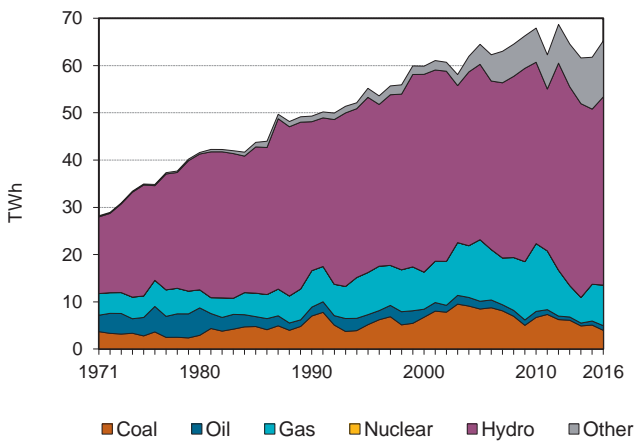


Figure 4. CO₂ from electricity generation: driving factors¹

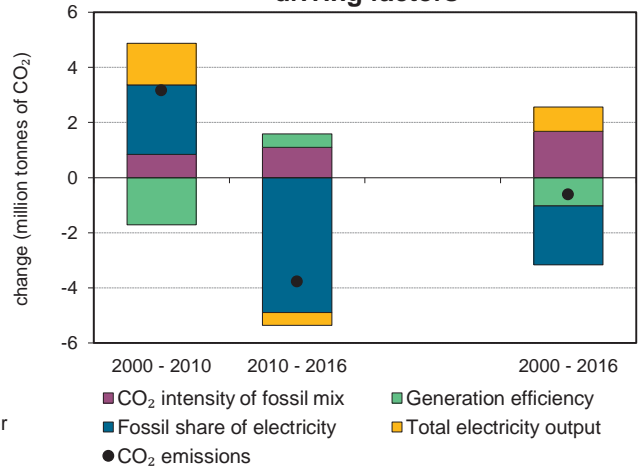


Figure 5. Changes in selected indicators

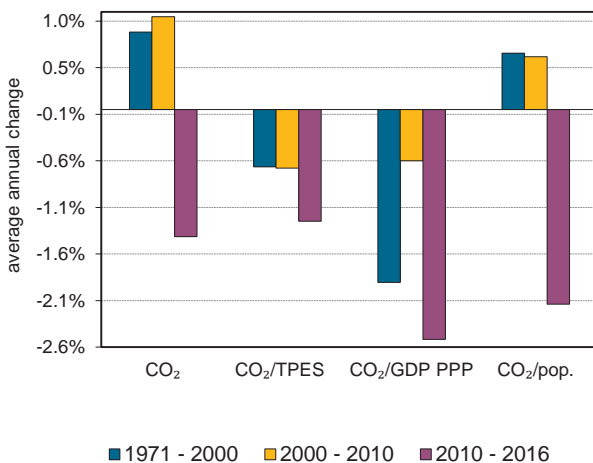
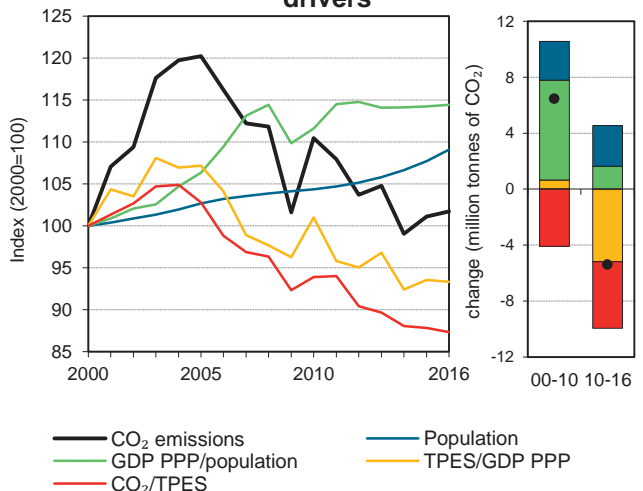


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Austria

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	56.2	59.5	61.8	74.3	68.3	62.5	62.9	12%
Share of World CO ₂ from fuel combustion	0.3%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%	
TPES (PJ)	1042	1 123	1 198	1 401	1 409	1 379	1 395	34%
GDP (billion 2010 USD)	260.2	290.4	336.5	367.3	391.9	414.0	420.0	61%
GDP PPP (billion 2010 USD)	233.5	260.6	301.9	329.6	351.7	371.5	376.9	61%
Population (millions)	7.7	7.9	8.0	8.2	8.4	8.6	8.7	14%
CO ₂ / TPES (tCO ₂ per TJ)	54	53.0	51.6	53.1	48.5	45.3	45.1	-17%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.22	0.2	0.2	0.2	0.2	0.2	0.2	-31%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.24	0.2	0.2	0.2	0.2	0.2	0.2	-31%
CO ₂ / population (tCO ₂ per capita)	7.3	7.5	7.7	9.0	8.2	7.2	7.2	-2%
Share of electricity output from fossil fuels	34%	30%	27%	37%	34%	24%	22%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	245	211	175	229	200	164	151	-38%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	106	110	132	121	111	112	12%
Population index	100	104	104	107	109	112	114	14%
GDP PPP per population index	100	108	124	132	138	142	142	42%
Energy intensity index - TPES / GDP PPP	100	97	89	95	90	83	83	-17%
Carbon intensity index - CO ₂ / TPES	100	98	96	98	90	84	83	-17%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	11.7	30.8	16.1	4.3	62.9	12%
Electricity and heat generation	5.7	1.0	4.6	2.3	13.5	-6%
Other energy industry own use	4.3	0.6	0.7	0.3	5.9	5%
Manufacturing industries and construction	1.7	1.8	6.3	1.8	11.5	21%
Transport	-	22.9	0.6	-	23.5	73%
<i>of which: road</i>	-	22.7	0.0	-	22.7	73%
Other	0.1	4.5	3.9	0.0	8.4	-36%
<i>of which: residential</i>	0.1	3.2	2.8	-	6.1	-39%
<i>of which: services</i>	0.0	0.6	1.0	0.0	1.6	-15%
<i>Memo: international marine bunkers</i>	-	0.1	-	-	0.1	13%
<i>Memo: international aviation bunkers</i>	-	2.3	-	-	2.3	162%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	22.7	13.1	25.6	25.6
Manufacturing industries - gas	6.3	3.8	7.1	32.8
Other energy industry - coal	4.3	2.9	4.9	37.6
Unallocated autoproducers - coal	4.0	1.6	4.6	42.2
Main activity prod. elec. and heat - gas	4.0	3.3	4.5	46.7
Residential - oil	3.2	5.3	3.6	50.3
Residential - gas	2.8	1.9	3.2	53.5
Manufacturing industries - other	1.8	0.4	2.0	55.6
Manufacturing industries - oil	1.8	2.2	2.0	57.5
<i>Memo: total CO₂ from fuel combustion</i>	62.9	56.2	71.0	71.0

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Azerbaijan

Figure 1. CO₂ emissions by fuel

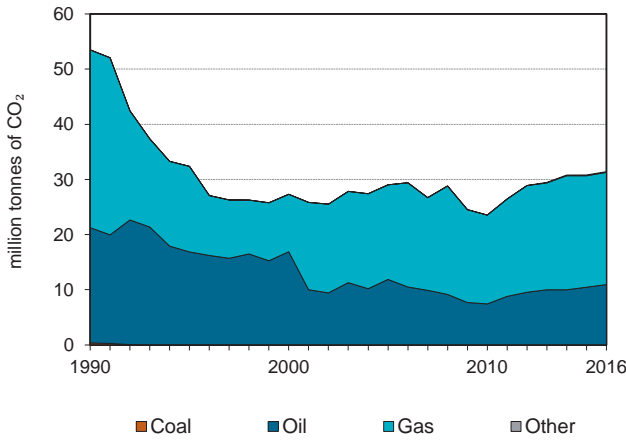


Figure 2. CO₂ emissions by sector

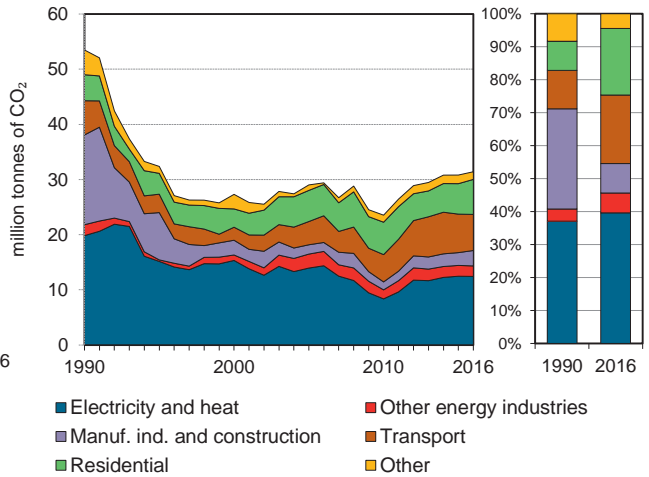


Figure 3. Electricity generation by fuel

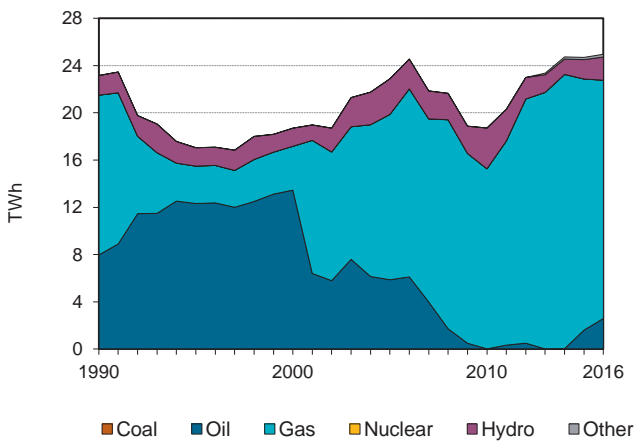


Figure 4. CO₂ from electricity generation: driving factors¹

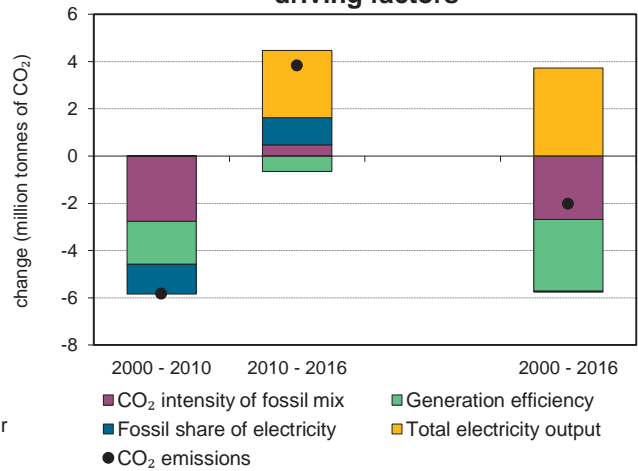


Figure 5. Changes in selected indicators

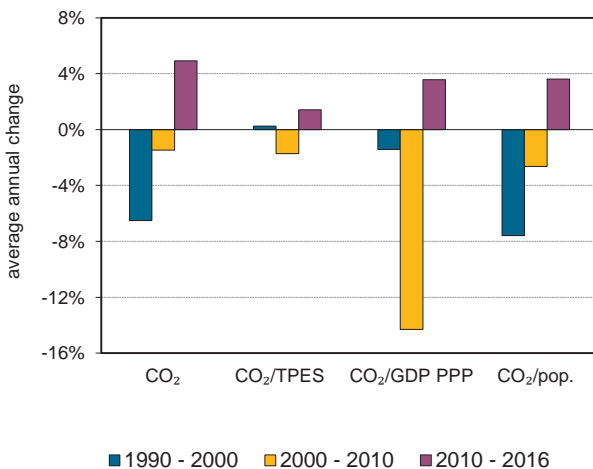
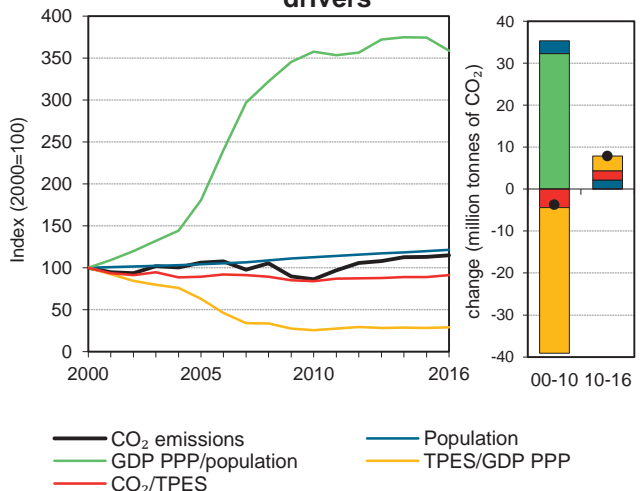


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Azerbaijan

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	53.5	32.4	27.3	29.0	23.5	30.8	31.4	-41%
Share of World CO ₂ from fuel combustion	0.3%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	
TPES (PJ)	949	582	473	562	485	601	595	-37%
GDP (billion 2010 USD)	22.3	9.3	13.1	24.8	52.9	59.0	57.2	156%
GDP PPP (billion 2010 USD)	59.7	25.0	35.2	66.2	141.5	157.9	153.0	156%
Population (millions)	7.2	7.7	8.0	8.4	9.1	9.6	9.8	36%
CO ₂ / TPES (tCO ₂ per TJ)	56.4	55.6	57.7	51.6	48.5	51.2	52.7	-6%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	2.4	3.5	2.1	1.2	0.4	0.5	0.5	-77%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.9	1.3	0.8	0.4	0.2	0.2	0.2	-77%
CO ₂ / population (tCO ₂ per capita)	7.5	4.2	3.4	3.5	2.6	3.2	3.2	-57%
Share of electricity output from fossil fuels	93%	91%	92%	87%	82%	93%	92%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	579	703	746	540	433	487	479	-17%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	61	51	54	44	58	59	-41%
Population index	100	107	112	117	126	135	136	36%
GDP PPP per population index	100	39	52	95	187	196	188	88%
Energy intensity index - TPES / GDP PPP	100	147	85	53	22	24	24	-76%
Carbon intensity index - CO ₂ / TPES	100	99	102	92	86	91	94	-6%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	10.9	20.3	0.1	31.4	-41%
Electricity and heat generation	-	1.9	10.4	0.1	12.4	-37%
Other energy industry own use	-	1.0	0.9	-	1.9	-4%
Manufacturing industries and construction	-	0.4	2.4	-	2.8	-83%
Transport	-	6.5	0.0	-	6.5	6%
<i>of which: road</i>	-	5.7	-	-	5.7	9%
Other	-	1.0	6.7	-	7.7	-16%
<i>of which: residential</i>	-	0.1	6.3	-	6.3	35%
<i>of which: services</i>	-	0.1	0.3	-	0.4	65%
<i>Memo: international marine bunkers</i>	-	0.2	-	-	0.2	x
<i>Memo: international aviation bunkers</i>	-	0.5	-	-	0.5	-49%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - gas	9.0	10.4	16.2	16.2
Residential - gas	6.3	4.6	11.4	27.6
Road - oil	5.7	5.1	10.4	38.0
Manufacturing industries - gas	2.4	14.7	4.3	42.3
Main activity prod. elec. and heat - oil	1.9	9.4	3.5	45.8
Unallocated autoproducers - gas	1.4	-	2.5	48.3
Other energy industry own use - oil	1.0	2.0	1.9	50.1
Non-specified other - oil	0.9	2.0	1.7	51.8
Other energy industry own use - gas	0.9	-	1.6	53.4
<i>Memo: total CO₂ from fuel combustion</i>	31.4	53.5	56.8	56.8

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Bahrain

Figure 1. CO₂ emissions by fuel

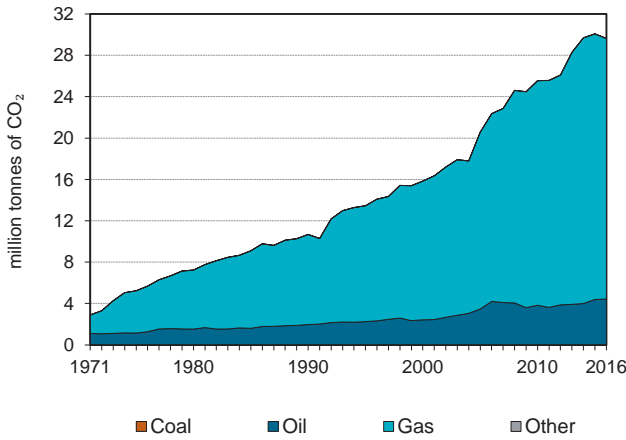


Figure 2. CO₂ emissions by sector

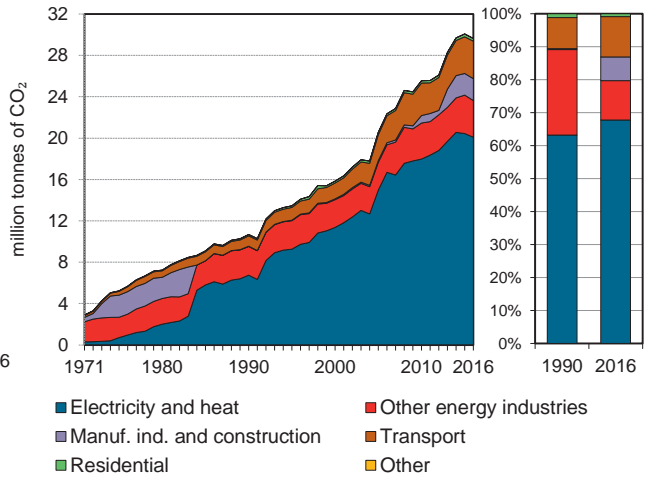


Figure 3. Electricity generation by fuel

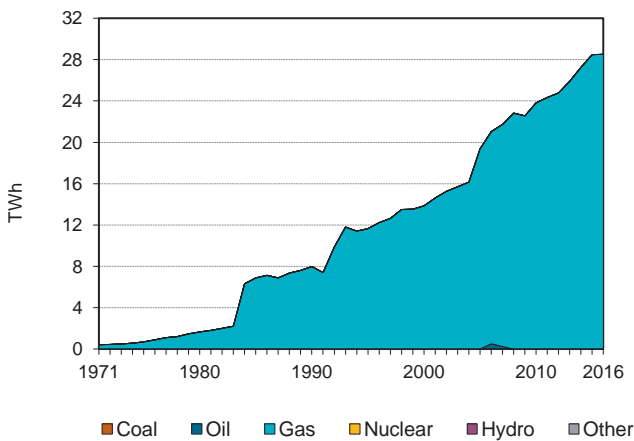


Figure 4. CO₂ from electricity generation: driving factors¹

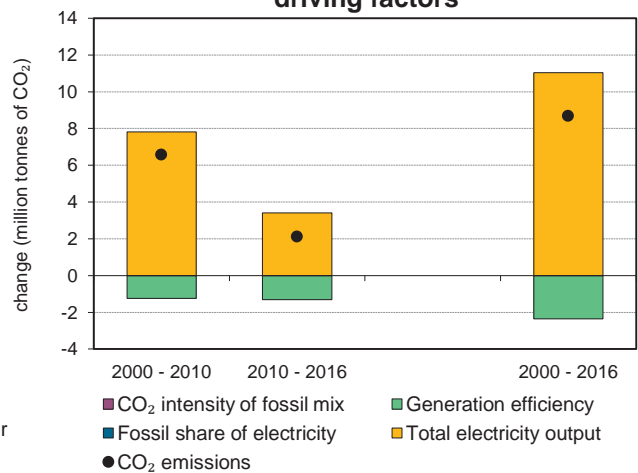


Figure 5. Changes in selected indicators

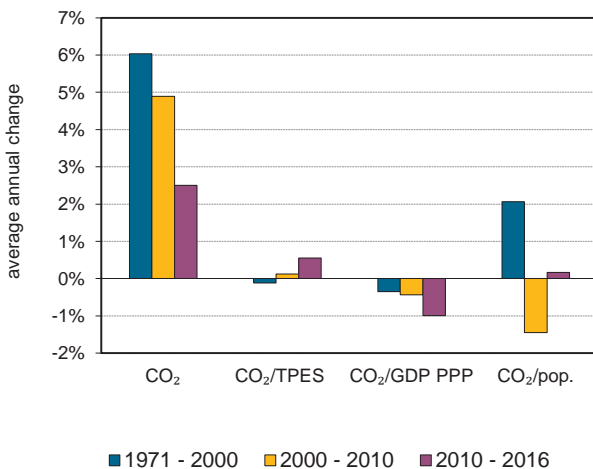
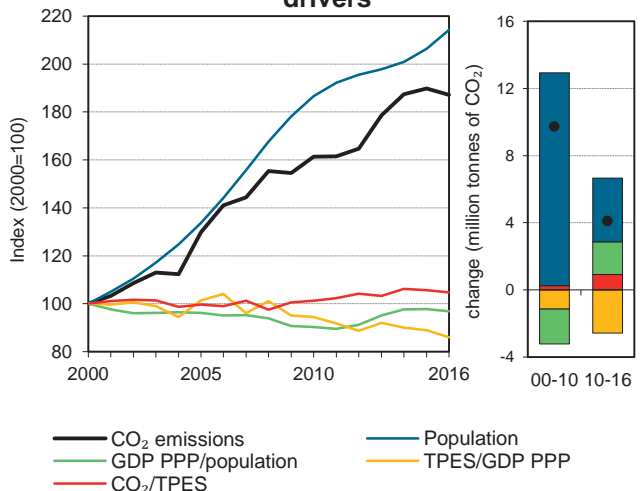


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Bahrain

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	10.7	13.5	15.8	20.6	25.6	30.1	29.6	178%
Share of World CO ₂ from fuel combustion	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	
TPES (PJ)	219	269	334	435	532	599	596	173%
GDP (billion 2010 USD)	8.9	12.4	15.3	19.6	25.7	30.8	31.7	256%
GDP PPP (billion 2010 USD)	17.1	23.7	29.3	37.6	49.3	59.0	60.8	256%
Population (millions)	0.5	0.6	0.7	0.9	1.2	1.4	1.4	187%
CO ₂ / TPES (tCO ₂ per TJ)	48.8	50.1	47.5	47.3	48.1	50.2	49.7	2%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.2	1.1	1.0	1.0	1.0	1.0	0.9	-22%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.63	0.6	0.5	0.5	0.5	0.5	0.5	-22%
CO ₂ / population (tCO ₂ per capita)	21.5	23.9	23.8	23.1	20.6	21.9	20.8	-3%
Share of electricity output from fossil fuels	100%	100%	100%	100%	100%	100%	100%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	845	796	820	773	755	718	705	-17%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	126	148	193	239	282	278	178%
Population index	100	114	134	179	250	277	287	187%
GDP PPP per population index	100	122	128	123	116	125	124	24%
Energy intensity index - TPES / GDP PPP	100	88	89	90	84	79	77	-23%
Carbon intensity index - CO ₂ / TPES	100	103	97	97	98	103	102	2%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	4.4	25.2	-	29.6	178%
Electricity and heat generation	-	0.0	20.1	-	20.1	198%
Other energy industry own use	-	0.5	3.0	-	3.5	28%
Manufacturing industries and construction	-	-	2.1	-	2.1	+
Transport	-	3.6	-	-	3.6	263%
<i>of which: road</i>	-	3.5	-	-	3.5	252%
Other	-	0.3	-	-	0.3	104%
<i>of which: residential</i>	-	0.3	-	-	0.3	104%
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	0.2	-	-	0.2	-1%
<i>Memo: international aviation bunkers</i>	-	1.4	-	-	1.4	-6%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - gas	12.4	3.7	31.7	31.7
Unallocated autoproducers - gas	7.7	3.0	19.7	51.3
Road - oil	3.5	1.0	9.0	60.3
Other energy industry own use - gas	3.0	1.9	7.7	68.0
Manufacturing industries - gas	2.1	0.0	5.4	73.4
Other energy industry own use - oil	0.5	0.8	1.4	74.8
Residential - oil	0.3	0.1	0.7	75.5
Other transport - oil	0.1	-	0.3	75.7
Main activity prod. elec. and heat - oil	0.0	-	0.0	75.8
<i>Memo: total CO₂ from fuel combustion</i>	29.6	10.7	75.8	75.8

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Bangladesh

Figure 1. CO₂ emissions by fuel

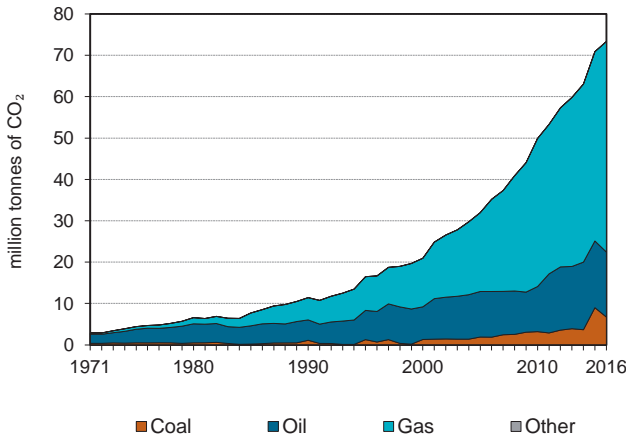


Figure 2. CO₂ emissions by sector

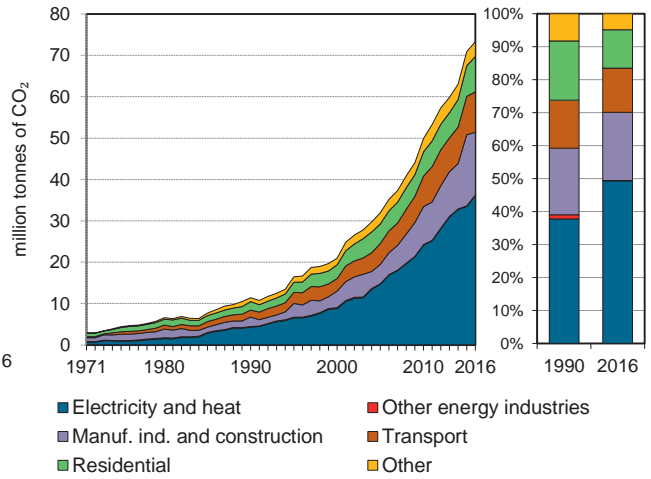


Figure 3. Electricity generation by fuel

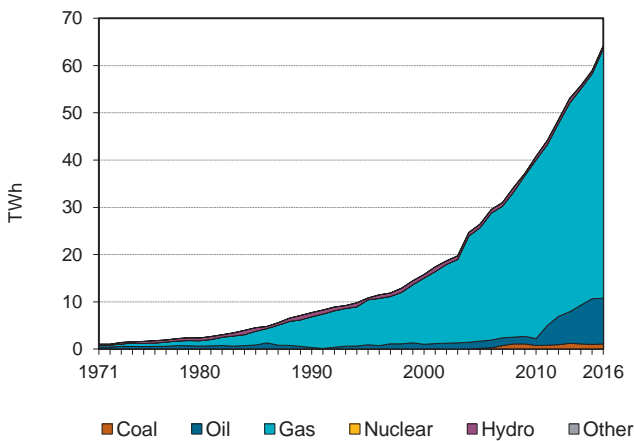


Figure 4. CO₂ from electricity generation: driving factors¹

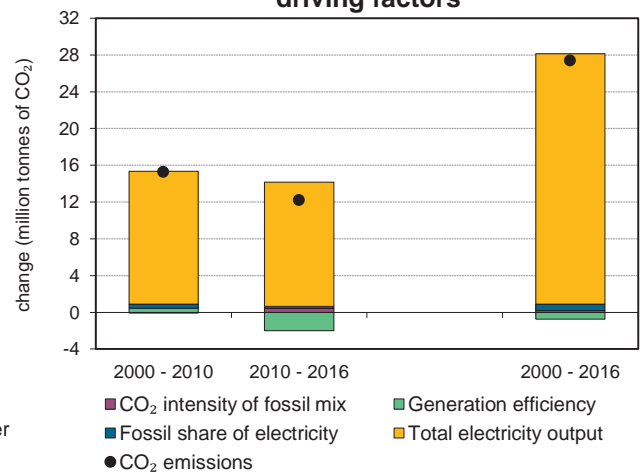


Figure 5. Changes in selected indicators

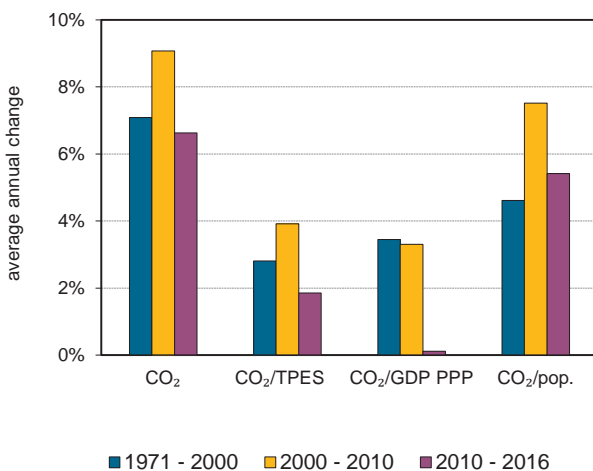
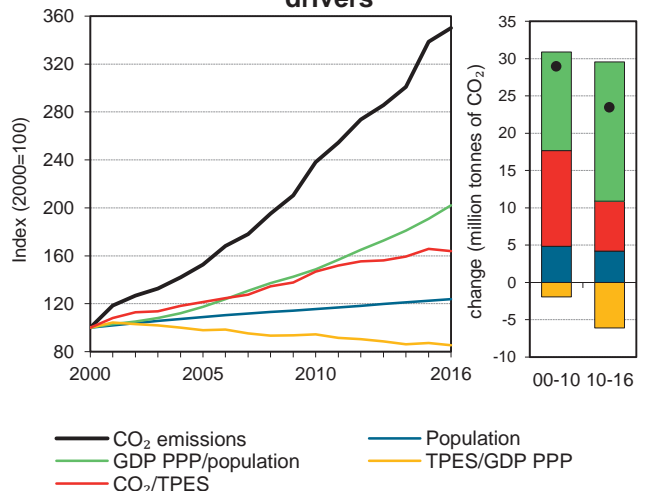


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Bangladesh

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	11.4	16.5	20.9	32.0	49.9	70.9	73.3	542%
Share of World CO ₂ from fuel combustion	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	
TPES (PJ)	534	661	775	974	1 258	1 582	1 656	210%
GDP (billion 2010 USD)	42.4	52.9	67.0	85.9	115.3	156.6	167.8	295%
GDP PPP (billion 2010 USD)	134	167.2	211.7	271.2	364.1	494.8	530.0	295%
Population (millions)	106.2	118.7	131.6	143.4	152.1	161.2	163.0	53%
CO ₂ / TPES (tCO ₂ per TJ)	21.4	24.9	27.0	32.8	39.7	44.8	44.3	107%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.27	0.3	0.3	0.4	0.4	0.5	0.4	62%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.09	0.1	0.1	0.1	0.1	0.1	0.1	62%
CO ₂ / population (tCO ₂ per capita)	0.1	0.1	0.2	0.2	0.3	0.4	0.5	317%
Share of electricity output from fossil fuels	89%	97%	95%	97%	98%	99%	99%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	558	605	559	555	591	567	562	1%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	144	183	280	437	621	642	542%
Population index	100	112	124	135	143	152	153	53%
GDP PPP per population index	100	112	127	150	190	243	258	158%
Energy intensity index - TPES / GDP PPP	100	99	92	90	87	80	78	-22%
Carbon intensity index - CO ₂ / TPES	100	117	126	153	185	209	207	107%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	6.7	15.7	50.9	-	73.3	542%
Electricity and heat generation	1.1	3.8	31.2	-	36.1	738%
Other energy industry own use	-	0.1	-	-	0.1	-14%
Manufacturing industries and construction	5.6	0.8	8.7	-	15.1	556%
Transport	-	7.2	2.6	-	9.8	488%
<i>of which: road</i>	-	4.9	2.6	-	7.5	526%
Other	-	3.8	8.3	-	12.1	304%
<i>of which: residential</i>	-	0.7	7.8	-	8.5	316%
<i>of which: services</i>	-	-	0.5	-	0.5	210%
<i>Memo: international marine bunkers</i>	-	0.4	-	-	0.4	471%
<i>Memo: international aviation bunkers</i>	-	1.1	-	-	1.1	303%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - gas	22.3	3.9	10.0	10.0
Unallocated autoproducers - gas	9.0	-	4.0	14.0
Manufacturing industries - gas	8.7	0.7	3.9	17.9
Residential - gas	7.8	0.5	3.5	21.4
Manufacturing industries - coal	5.6	1.1	2.5	23.9
Road - oil	4.9	1.2	2.2	26.1
Main activity prod. elec. and heat - oil	3.8	0.4	1.7	27.8
Non-specified other - oil	3.0	0.8	1.4	29.1
Road - gas	2.6	-	1.2	30.3
<i>Memo: total CO₂ from fuel combustion</i>	73.3	11.4	32.8	32.8

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Belarus

Figure 1. CO₂ emissions by fuel

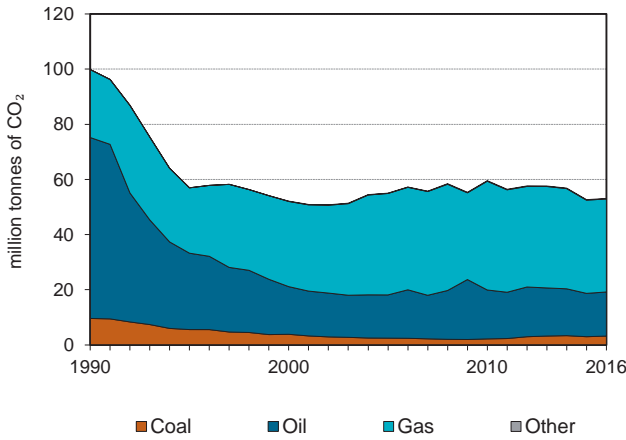


Figure 2. CO₂ emissions by sector

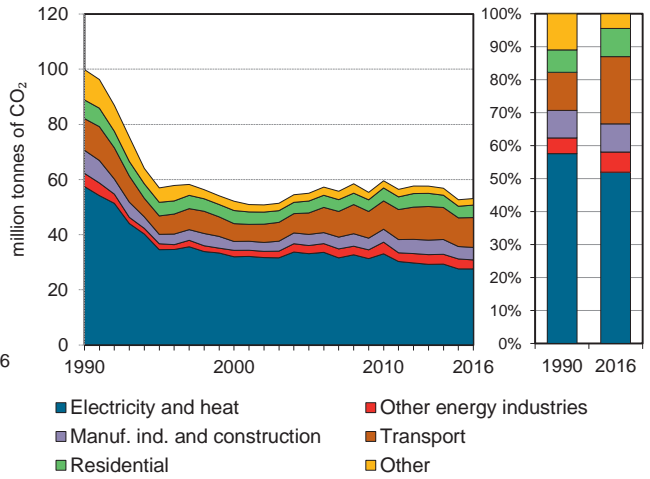


Figure 3. Electricity generation by fuel

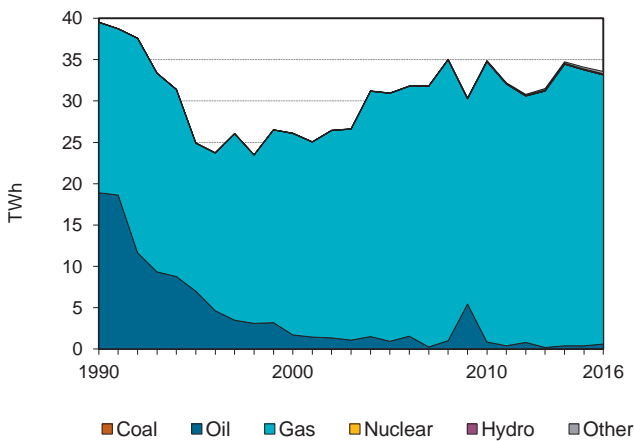


Figure 4. CO₂ from electricity generation: driving factors¹

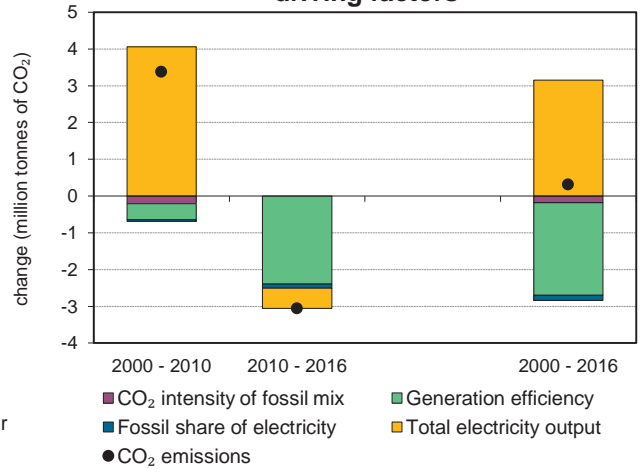


Figure 5. Changes in selected indicators

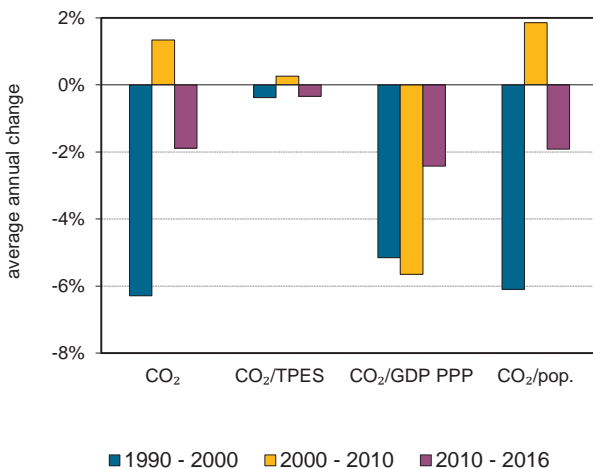
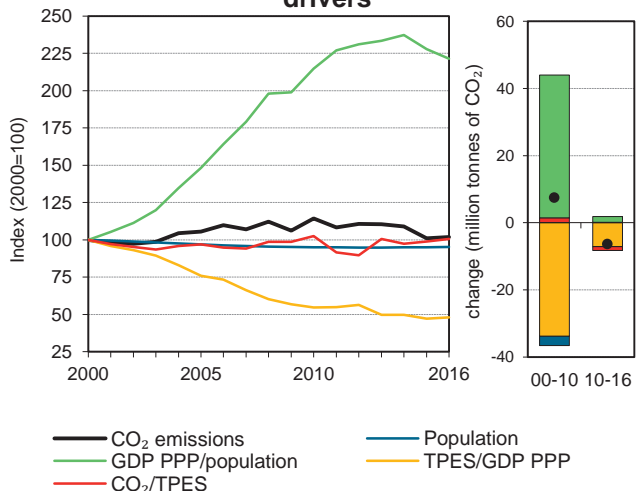


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Belarus

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	99.9	57.0	52.1	55.0	59.5	52.7	53.1	-47%
Share of World CO ₂ from fuel combustion	0.5%	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	
TPES (PJ)	1907	1 039	1 034	1 126	1 151	1 056	1 048	-45%
GDP (billion 2010 USD)	31.6	20.6	28.0	40.3	57.2	60.7	59.1	87%
GDP PPP (billion 2010 USD)	83.4	54.5	73.9	106.2	151.0	160.2	156.0	87%
Population (millions)	10.2	10.2	10.0	9.7	9.5	9.5	9.5	-7%
CO ₂ / TPES (tCO ₂ per TJ)	52.4	54.8	50.4	48.9	51.7	49.9	50.6	-3%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	3.16	2.8	1.9	1.4	1.0	0.9	0.9	-72%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	1.2	1.0	0.7	0.5	0.4	0.3	0.3	-72%
CO ₂ / population (tCO ₂ per capita)	9.8	5.6	5.2	5.7	6.3	5.5	5.6	-43%
Share of electricity output from fossil fuels	100%	100%	100%	100%	100%	99%	99%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	553	504	474	461	451	387	378	-32%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	57	52	55	60	53	53	-47%
Population index	100	100	98	95	93	93	93	-7%
GDP PPP per population index	100	65	91	134	194	206	200	100%
Energy intensity index - TPES / GDP PPP	100	83	61	46	33	29	29	-71%
Carbon intensity index - CO ₂ / TPES	100	105	96	93	99	95	97	-3%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	3.2	16.0	33.7	0.2	53.1	-47%
Electricity and heat generation	0.5	1.0	26.0	0.2	27.6	-52%
Other energy industry own use	0.0	2.7	0.5	-	3.3	-32%
Manufacturing industries and construction	2.0	0.5	2.0	0.0	4.5	-46%
Transport	0.0	9.7	1.1	-	10.8	-6%
<i>of which: road</i>	-	9.1	0.0	-	9.1	-4%
Other	0.7	2.1	4.2	-	6.9	-61%
<i>of which: residential</i>	0.5	0.2	3.8	-	4.5	-33%
<i>of which: services</i>	0.1	0.1	0.1	-	0.4	-95%
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.4	-	-	0.4	x

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - gas	21.4	16.5	23.9	23.9
Road - oil	9.1	9.4	10.2	34.1
Unallocated autoproducers - gas	4.5	2.2	5.0	39.1
Residential - gas	3.8	1.7	4.3	43.4
Other energy industry own use - oil	2.7	4.4	3.1	46.5
Manufacturing industries - gas	2.0	2.4	2.3	48.7
Manufacturing industries - coal	2.0	0.3	2.2	51.0
Non-specified other - oil	1.9	7.5	2.1	53.1
Other transport - gas	1.1	0.2	1.2	54.3
<i>Memo: total CO₂ from fuel combustion</i>	<i>53.1</i>	<i>99.9</i>	<i>59.2</i>	<i>59.2</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Belgium

Figure 1. CO₂ emissions by fuel

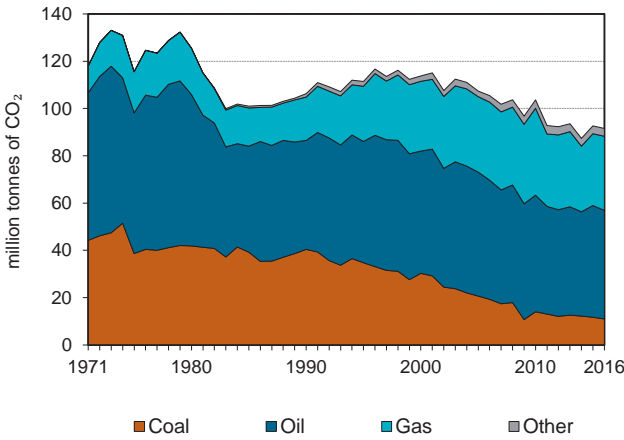


Figure 2. CO₂ emissions by sector

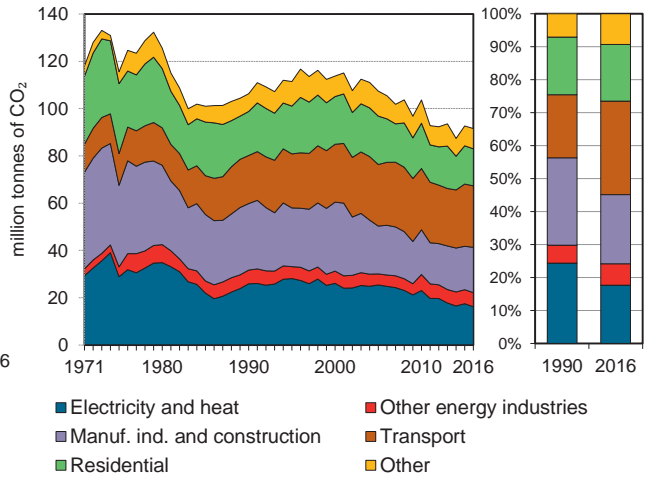


Figure 3. Electricity generation by fuel

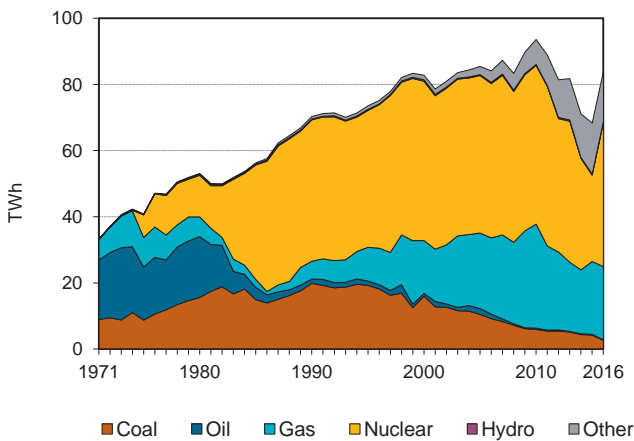


Figure 4. CO₂ from electricity generation: driving factors¹

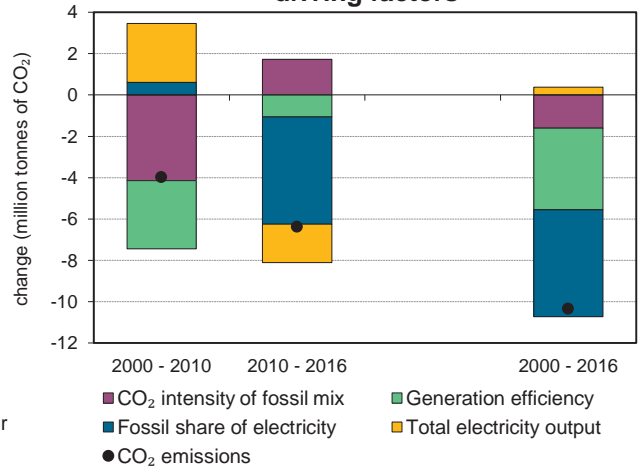


Figure 5. Changes in selected indicators

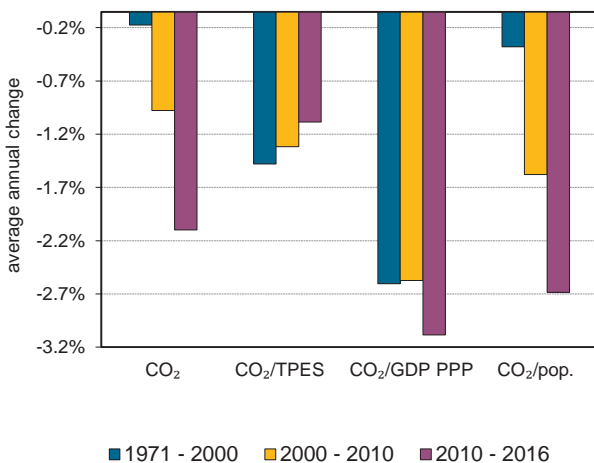
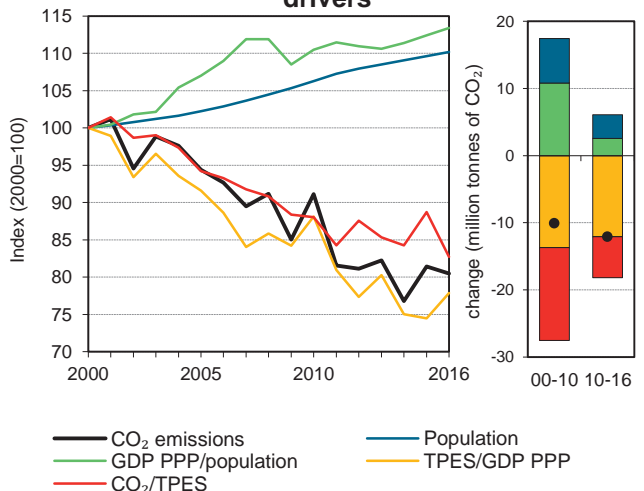


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Belgium

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	106.3	111.5	113.8	107.4	103.7	92.6	91.6	-14%
Share of World CO ₂ from fuel combustion	0.5%	0.5%	0.5%	0.4%	0.3%	0.3%	0.3%	
TPES (PJ)	2007	2 236	2 432	2 437	2 517	2 232	2 366	18%
GDP (billion 2010 USD)	330	357.1	411.8	450.5	483.5	507.9	515.1	56%
GDP PPP (billion 2010 USD)	298.4	322.9	372.4	407.4	437.2	458.8	465.3	56%
Population (millions)	10	10.1	10.3	10.5	10.9	11.2	11.3	13%
CO ₂ / TPES (tCO ₂ per TJ)	53	49.9	46.8	44.1	41.2	41.5	38.7	-27%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.32	0.3	0.3	0.2	0.2	0.2	0.2	-45%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.36	0.3	0.3	0.3	0.2	0.2	0.2	-45%
CO ₂ / population (tCO ₂ per capita)	10.7	11.0	11.1	10.2	9.5	8.2	8.1	-24%
Share of electricity output from fossil fuels	38%	43%	41%	42%	42%	40%	31%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	358	373	299	282	222	228	172	-52%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	105	107	101	98	87	86	-14%
Population index	100	102	103	105	109	113	113	13%
GDP PPP per population index	100	106	121	130	134	136	138	38%
Energy intensity index - TPES / GDP PPP	100	103	97	89	86	72	76	-24%
Carbon intensity index - CO ₂ / TPES	100	94	88	83	78	78	73	-27%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	11.0	45.9	31.4	3.3	91.6	-14%
Electricity and heat generation	5.2	0.1	8.5	2.4	16.2	-37%
Other energy industry own use	1.7	3.4	0.8	-	6.0	3%
Manufacturing industries and construction	3.7	5.6	9.0	0.9	19.2	-32%
Transport	-	25.9	0.1	-	26.0	28%
<i>of which: road</i>	-	25.2	0.0	-	25.2	29%
Other	0.3	10.9	13.0	-	24.2	-7%
<i>of which: residential</i>	0.3	7.3	8.0	-	15.7	-16%
<i>of which: services</i>	-	2.4	4.4	-	6.8	14%
<i>Memo: international marine bunkers</i>	-	21.4	-	-	21.4	64%
<i>Memo: international aviation bunkers</i>	-	4.3	-	-	4.3	51%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	25.2	19.5	20.3	20.3
Manufacturing industries - gas	9.0	6.8	7.2	27.5
Residential - gas	8.0	5.8	6.5	34.0
Main activity prod. elec. and heat - gas	7.5	2.7	6.0	40.0
Residential - oil	7.3	10.7	5.9	45.9
Manufacturing industries - oil	5.6	5.3	4.5	50.5
Main activity prod. elec. and heat - coal	5.1	18.5	4.1	54.6
Non-specified other - gas	5.0	2.4	4.0	58.6
Manufacturing industries - coal	3.7	15.8	3.0	61.6
<i>Memo: total CO₂ from fuel combustion</i>	<i>91.6</i>	<i>106.3</i>	<i>73.8</i>	<i>73.8</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Benin

Figure 1. CO₂ emissions by fuel

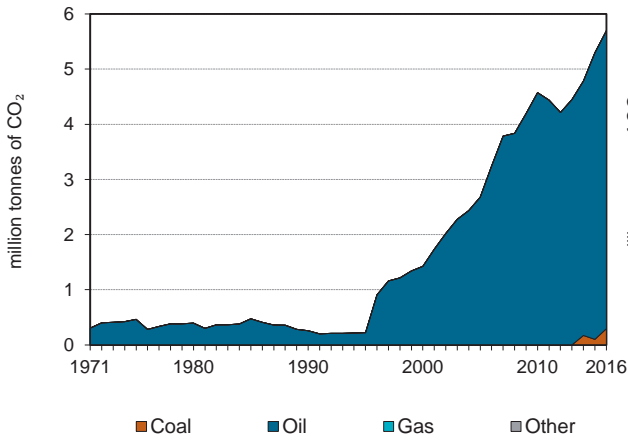


Figure 2. CO₂ emissions by sector

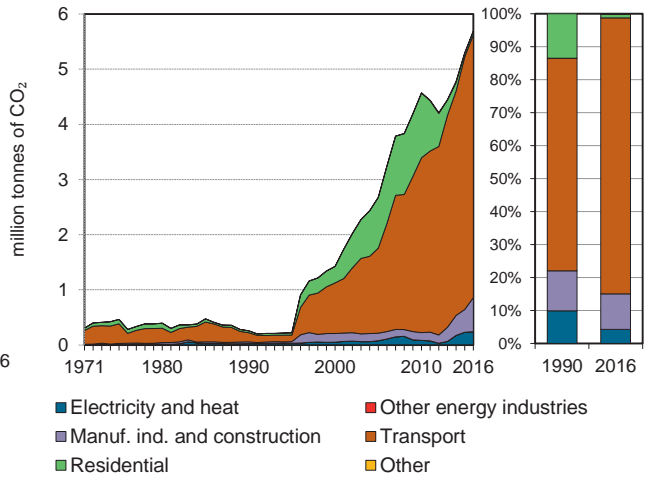


Figure 3. Electricity generation by fuel

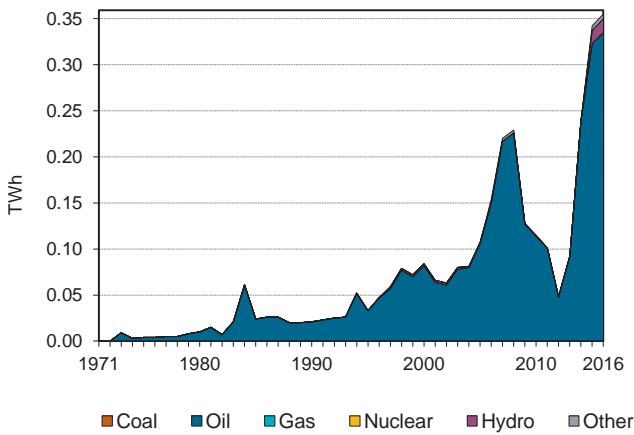


Figure 4. CO₂ from electricity generation: driving factors¹

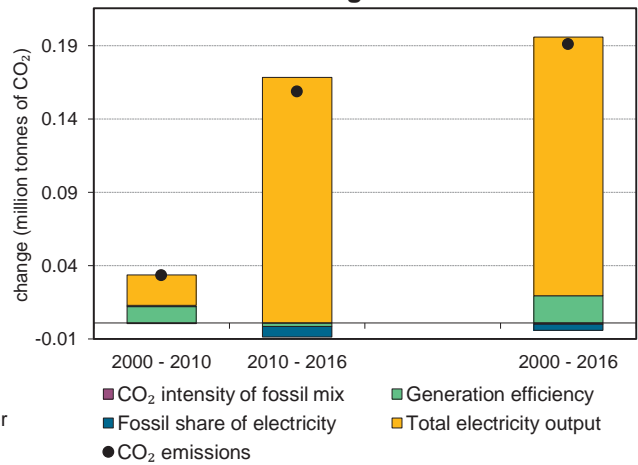


Figure 5. Changes in selected indicators

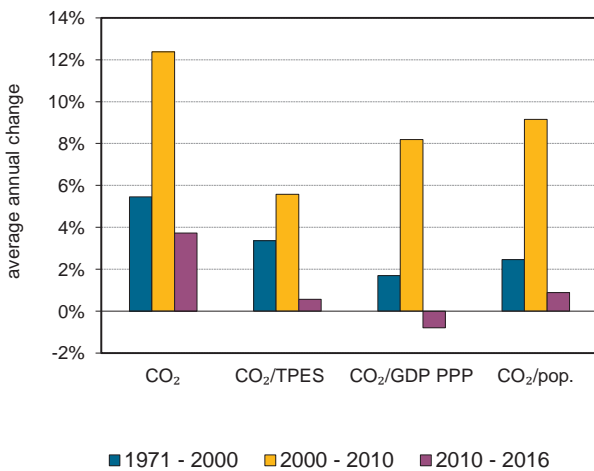
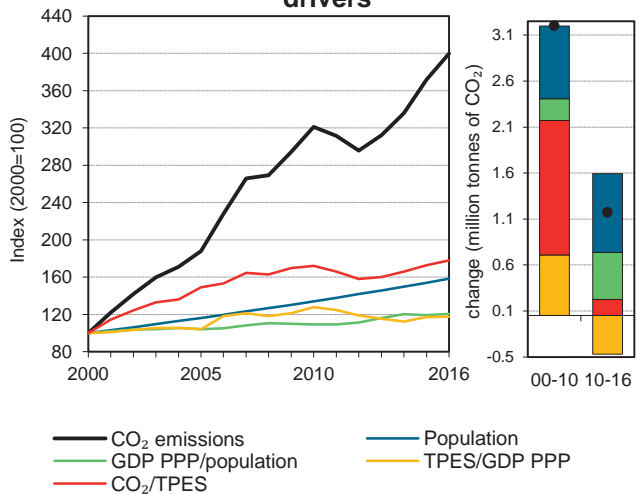


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Benin

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	0.3	0.2	1.4	2.7	4.6	5.3	5.7	+
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	70	77	83	105	155	179	186	168%
GDP (billion 2010 USD)	3	3.7	4.8	5.8	7.0	8.8	9.1	200%
GDP PPP (billion 2010 USD)	7.1	8.8	11.2	13.6	16.4	20.6	21.4	200%
Population (millions)	5	5.9	6.9	8.0	9.2	10.6	10.9	118%
CO ₂ / TPES (tCO ₂ per TJ)	3.7	2.9	17.2	25.6	29.5	29.7	30.5	729%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.09	0.1	0.3	0.5	0.7	0.6	0.6	636%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.04	0.0	0.1	0.2	0.3	0.3	0.3	639%
CO ₂ / population (tCO ₂ per capita)	0.1	0.0	0.2	0.3	0.5	0.5	0.5	908%
Share of electricity output from fossil fuels	100%	100%	98%	99%	99%	94%	94%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	1213	961	608	717	725	675	678	-44%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	86	556	1044	1784	2066	2221	2121%
Population index	100	119	138	160	185	212	218	118%
GDP PPP per population index	100	104	114	119	124	136	137	37%
Energy intensity index - TPES / GDP PPP	100	90	76	79	97	89	89	-11%
Carbon intensity index - CO ₂ / TPES	100	78	466	694	801	805	829	729%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.3	5.4	-	-	5.7	+
Electricity and heat generation	-	0.2	-	-	0.2	845%
Other energy industry own use	-	-	-	-	-	-
Manufacturing industries and construction	0.3	0.3	-	-	0.6	+
Transport	-	4.8	-	-	4.8	+
<i>of which: road</i>	-	4.8	-	-	4.8	+
Other	-	0.1	-	-	0.1	112%
<i>of which: residential</i>	-	0.1	-	-	0.1	86%
<i>of which: services</i>	-	0.0	-	-	0.0	x
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	-	-	-	-	-100%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	4.8	0.2	30.9	30.9
Manufacturing industries - oil	0.3	0.0	2.1	33.0
Manufacturing industries - coal	0.3	-	1.9	34.9
Main activity prod. elec. and heat - oil	0.2	0.0	1.0	35.9
Unallocated autoproducers - oil	0.1	-	0.5	36.4
Residential - oil	0.1	0.0	0.4	36.9
Non-specified other - oil	0.0	-	0.1	36.9
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	<i>5.7</i>	<i>0.3</i>	<i>36.9</i>	<i>36.9</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Plurinational State of Bolivia

Figure 1. CO₂ emissions by fuel

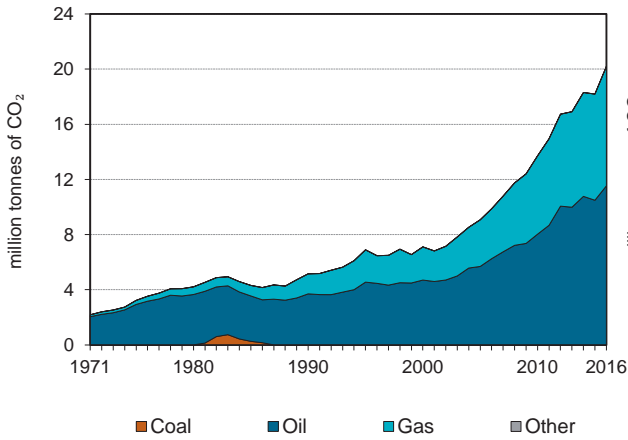


Figure 2. CO₂ emissions by sector

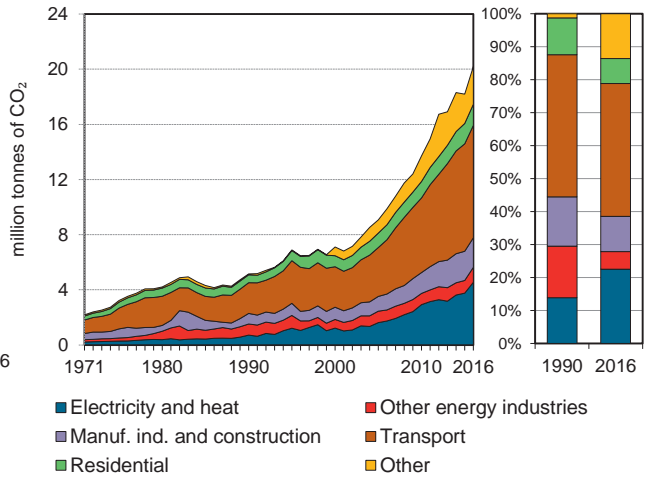


Figure 3. Electricity generation by fuel

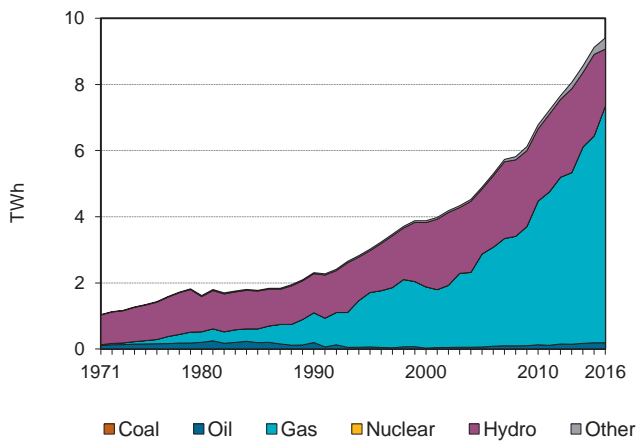


Figure 4. CO₂ from electricity generation: driving factors¹

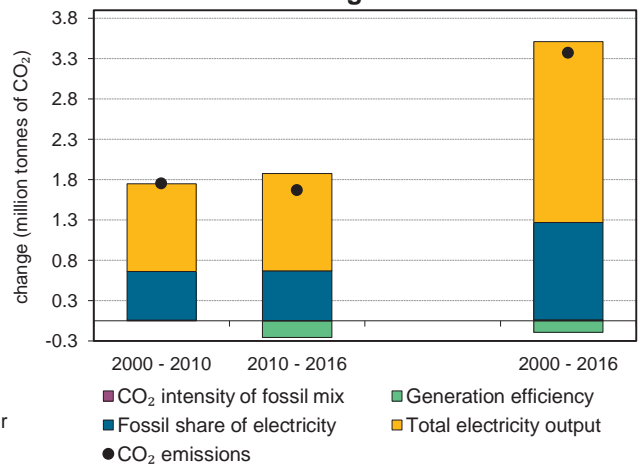


Figure 5. Changes in selected indicators

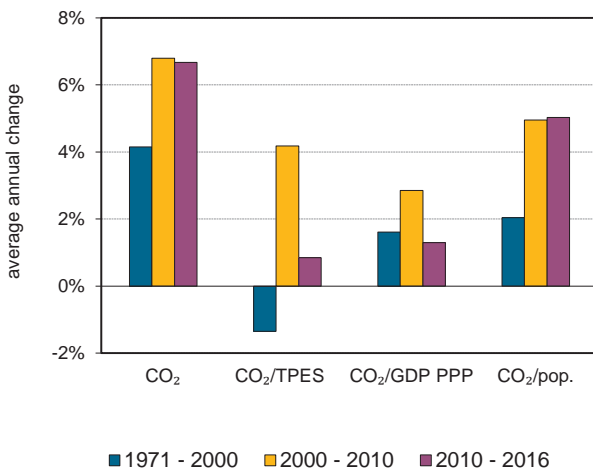
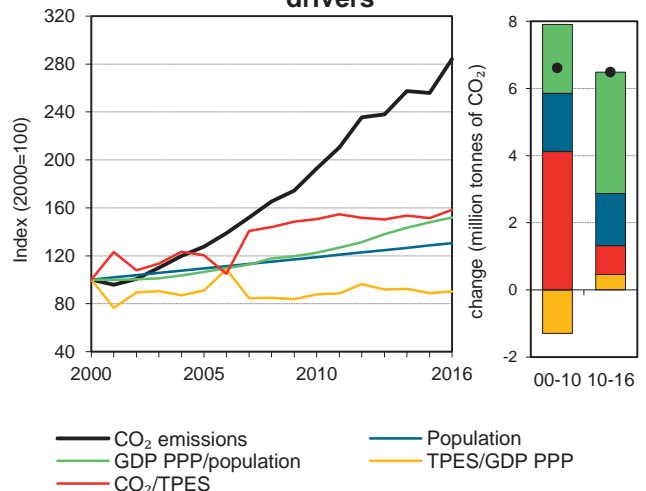


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Plurinational State of Bolivia

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	5.2	6.9	7.1	9.1	13.7	18.2	20.2	292%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	
TPES (PJ)	109	158	206	218	264	348	369	238%
GDP (billion 2010 USD)	9.3	11.4	13.5	15.7	19.7	25.7	26.8	187%
GDP PPP (billion 2010 USD)	24.9	30.4	36.1	42.0	52.5	68.6	71.6	187%
Population (millions)	6.9	7.6	8.3	9.1	9.9	10.7	10.9	59%
CO ₂ / TPES (tCO ₂ per TJ)	47.1	43.7	34.5	41.6	52.0	52.2	54.7	16%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.55	0.6	0.5	0.6	0.7	0.7	0.8	37%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.21	0.2	0.2	0.2	0.3	0.3	0.3	36%
CO ₂ / population (tCO ₂ per capita)	0.8	0.9	0.9	1.0	1.4	1.7	1.9	147%
Share of electricity output from fossil fuels	48%	57%	49%	59%	66%	71%	78%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	310	402	315	331	432	412	483	56%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	134	138	176	266	353	392	292%
Population index	100	110	122	133	145	156	159	59%
GDP PPP per population index	100	111	119	127	146	176	181	81%
Energy intensity index - TPES / GDP PPP	100	118	130	118	114	116	118	18%
Carbon intensity index - CO ₂ / TPES	100	93	73	88	110	111	116	16%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	11.5	8.7	-	20.2	292%
Electricity and heat generation	-	0.2	4.4	-	4.5	536%
Other energy industry own use	-	0.4	0.7	-	1.1	35%
Manufacturing industries and construction	-	0.3	1.8	-	2.1	179%
Transport	-	6.8	1.4	-	8.2	266%
<i>of which: road</i>	-	6.4	1.4	-	7.8	315%
Other	-	3.9	0.4	-	4.3	569%
<i>of which: residential</i>	-	1.2	0.3	-	1.5	166%
<i>of which: services</i>	-	0.0	0.1	-	0.1	x
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.2	-	-	0.2	x

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	6.4	1.9	10.9	10.9
Main activity prod. elec. and heat - gas	4.4	0.5	7.4	18.3
Non-specified other - oil	2.6	0.1	4.5	22.8
Manufacturing industries - gas	1.8	0.4	3.1	25.9
Road - gas	1.4	-	2.4	28.2
Residential - oil	1.2	0.6	2.1	30.3
Other energy industry own use - gas	0.7	0.5	1.2	31.5
Other energy industry own use - oil	0.4	0.3	0.6	32.2
Other transport - oil	0.4	0.4	0.6	32.8
<i>Memo: total CO₂ from fuel combustion</i>	20.2	5.2	34.3	34.3

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Bosnia and Herzegovina

Figure 1. CO₂ emissions by fuel

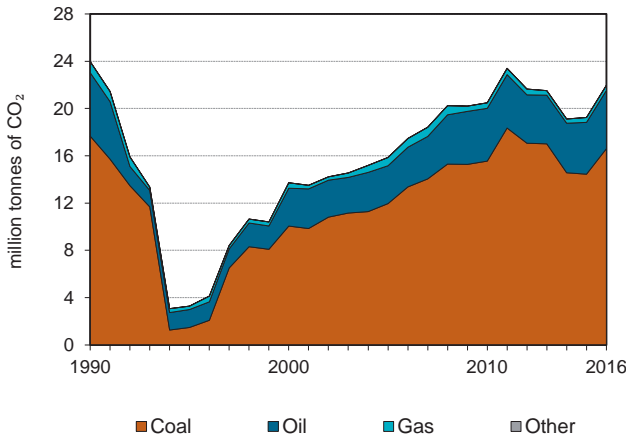


Figure 2. CO₂ emissions by sector

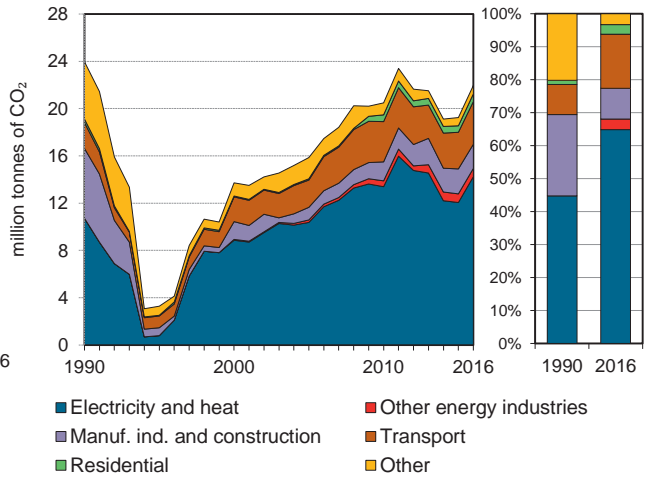


Figure 3. Electricity generation by fuel

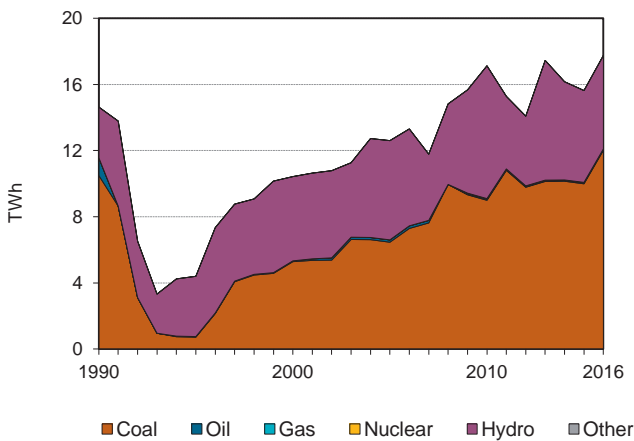


Figure 4. CO₂ from electricity generation: driving factors¹

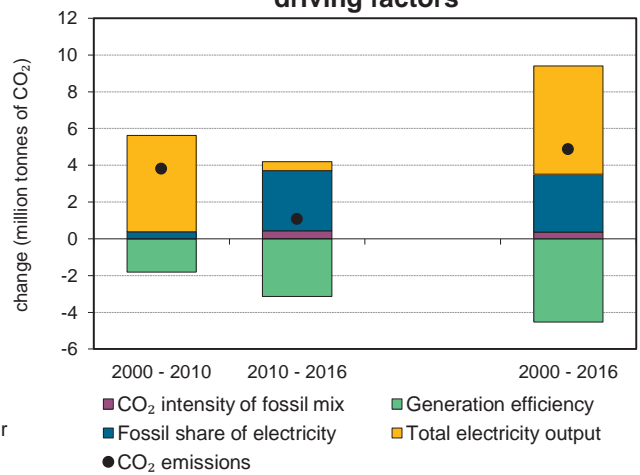


Figure 5. Changes in selected indicators

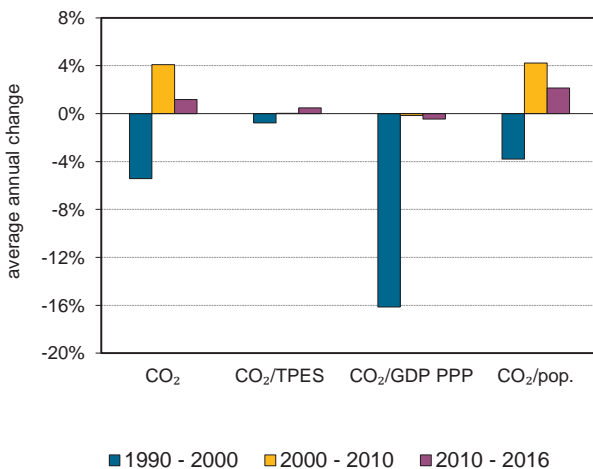
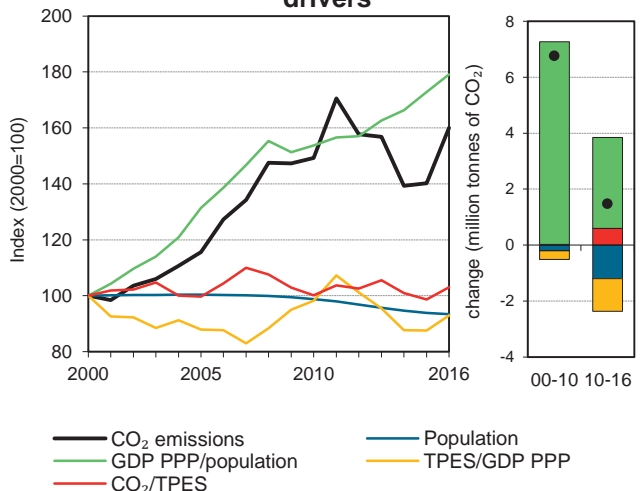


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Bosnia and Herzegovina

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	24	3.3	13.7	15.9	20.5	19.2	22.0	-8%
Share of World CO ₂ from fuel combustion	0.1%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	
TPES (PJ)	294	63	182	211	271	259	283	-4%
GDP (billion 2010 USD)	3.4	3.3	11.3	14.9	17.2	18.3	18.7	449%
GDP PPP (billion 2010 USD)	6.9	6.7	22.8	30.1	34.7	37.0	38.2	456%
Population (millions)	4.5	3.8	3.8	3.8	3.7	3.5	3.5	-21%
CO ₂ / TPES (tCO ₂ per TJ)	81.6	52.4	75.4	75.1	75.5	74.4	77.7	-5%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	7.06	1.0	1.2	1.1	1.2	1.1	1.2	-83%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	3.49	0.5	0.6	0.5	0.6	0.5	0.6	-84%
CO ₂ / population (tCO ₂ per capita)	5.4	0.9	3.6	4.2	5.5	5.4	6.2	16%
Share of electricity output from fossil fuels	79%	17%	51%	52%	53%	65%	68%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	725	180	840	813	737	731	771	6%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	14	57	66	85	80	92	-8%
Population index	100	86	84	85	83	79	79	-21%
GDP PPP per population index	100	114	394	518	606	682	706	606%
Energy intensity index - TPES / GDP PPP	100	22	19	16	18	16	17	-83%
Carbon intensity index - CO ₂ / TPES	100	64	92	92	93	91	95	-5%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	16.6	4.9	0.4	-	22.0	-8%
Electricity and heat generation	14.0	0.1	0.1	-	14.2	33%
Other energy industry own use	0.3	0.4	-	-	0.7	x
Manufacturing industries and construction	1.5	0.3	0.2	-	2.0	-65%
Transport	-	3.6	0.0	-	3.6	65%
<i>of which: road</i>	-	3.6	0.0	-	3.6	65%
Other	0.8	0.5	0.1	-	1.4	-73%
<i>of which: residential</i>	0.3	0.3	0.1	-	0.6	121%
<i>of which: services</i>	0.5	0.2	0.1	-	0.7	x
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.0	-	-	0.0	-60%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	13.1	9.6	43.8	43.8
Road - oil	3.6	2.2	12.0	55.8
Manufacturing industries - coal	1.5	3.2	5.1	60.9
Unallocated autoproducers - coal	0.9	-	3.0	63.8
Non-specified other sectors - coal	0.5	4.9	1.5	65.4
Other energy industry own use - oil	0.4	-	1.4	66.7
Manufacturing industries - oil	0.3	1.9	1.2	67.9
Residential - coal	0.3	-	1.0	68.9
Other energy industry - coal	0.3	-	1.0	69.9
<i>Memo: total CO₂ from fuel combustion</i>	<i>22.0</i>	<i>24</i>	<i>73.2</i>	<i>73.2</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Botswana ¹

Figure 1. CO₂ emissions by fuel

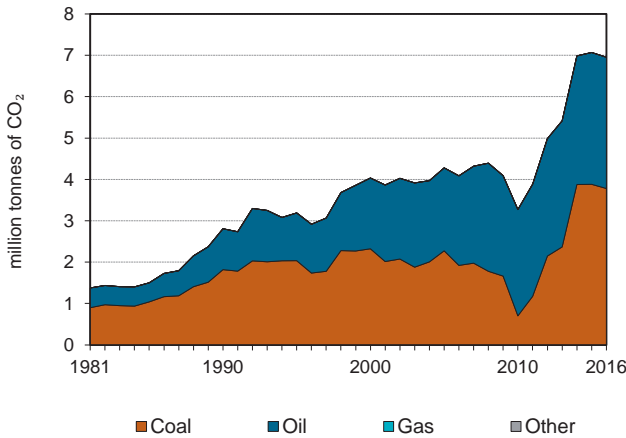


Figure 2. CO₂ emissions by sector

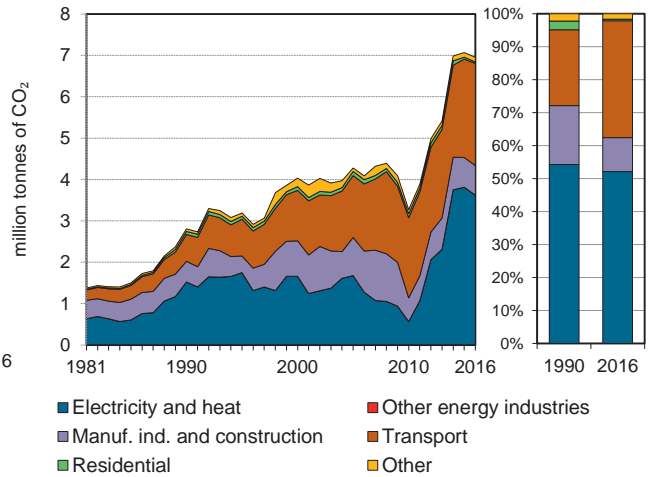


Figure 3. Electricity generation by fuel

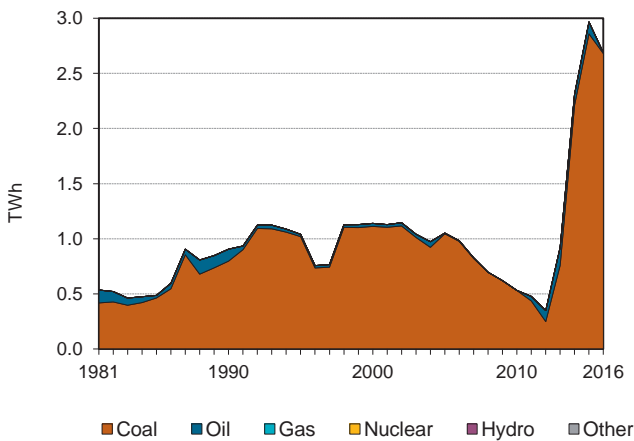


Figure 4. CO₂ from electricity generation: driving factors²

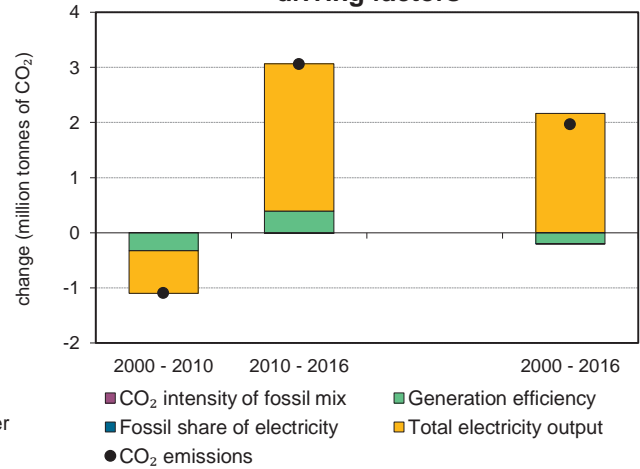


Figure 5. Changes in selected indicators

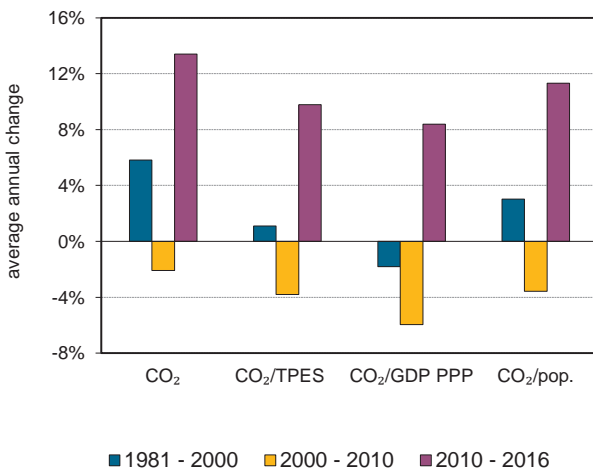
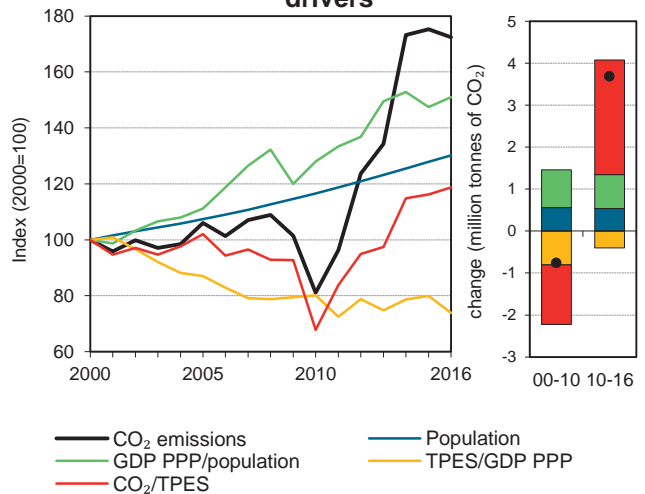


Figure 6. Total CO₂ emissions and drivers³



1. Prior to 1980, data for Botswana were included in Other Africa.

2. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.

3. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Botswana ¹

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	2.8	3.2	4.0	4.3	3.3	7.1	7.0	148%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	51	61	75	78	90	113	109	114%
GDP (billion 2010 USD)	5.3	6.6	8.6	10.2	12.8	16.1	16.6	212%
GDP PPP (billion 2010 USD)	11	13.7	17.6	21.1	26.3	33.2	34.7	217%
Population (millions)	1.4	1.6	1.7	1.9	2.0	2.2	2.3	63%
CO ₂ / TPES (tCO ₂ per TJ)	55	52.6	53.7	54.8	36.4	62.4	63.7	16%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.53	0.5	0.5	0.4	0.3	0.4	0.4	-21%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.26	0.2	0.2	0.2	0.1	0.2	0.2	-21%
CO ₂ / population (tCO ₂ per capita)	2	2.0	2.3	2.3	1.6	3.2	3.1	52%
Share of electricity output from fossil fuels	100%	100%	100%	100%	100%	100%	100%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	1681	1681	1457	1595	1066	1285	1348	-20%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ²								
CO ₂ emissions index	100	114	144	152	117	252	248	148%
Population index	100	114	125	135	146	160	163	63%
GDP PPP per population index	100	110	128	143	164	189	194	94%
Energy intensity index - TPES / GDP PPP	100	95	92	80	73	73	68	-32%
Carbon intensity index - CO ₂ / TPES	100	96	98	99	66	113	116	16%

1. Prior to 1980, data for Botswana were included in Other Africa. 2. Please see Part I for methodological notes.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ³	Total	%change 90-16
CO₂ fuel combustion	3.8	3.2	-	-	7.0	148%
Electricity and heat generation	3.6	0.0	-	-	3.6	138%
Other energy industry own use	-	-	-	-	-	-
Manufacturing industries and construction	0.1	0.6	-	-	0.7	43%
Transport	-	2.5	-	-	2.5	281%
<i>of which: road</i>	-	2.4	-	-	2.4	301%
Other	0.0	0.1	-	-	0.1	9%
<i>of which: residential</i>	-	0.0	-	-	0.0	-50%
<i>of which: services</i>	0.0	0.1	-	-	0.1	116%
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.0	-	-	0.0	-

3. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ⁴ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	3.6	1.1	28.2	28.2
Road - oil	2.4	0.6	18.9	47.2
Manufacturing industries - oil	0.6	0.1	4.4	51.6
Manufacturing industries - coal	0.1	0.4	1.2	52.7
Non-specified other - oil	0.1	0.1	0.7	53.5
Other transport - oil	0.0	0.0	0.3	53.8
Residential - oil	0.0	0.1	0.3	54.1
Non-specified other sectors - coal	0.0	0.0	0.1	54.2
Main activity prod. elec. and heat - oil	0.0	0.1	0.1	54.2
<i>Memo: total CO₂ from fuel combustion</i>	<i>7.0</i>	<i>2.8</i>	<i>54.2</i>	<i>54.2</i>

4. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Brazil

Figure 1. CO₂ emissions by fuel

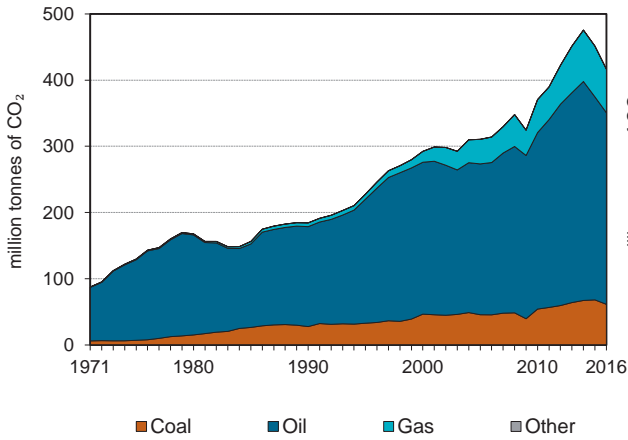


Figure 2. CO₂ emissions by sector

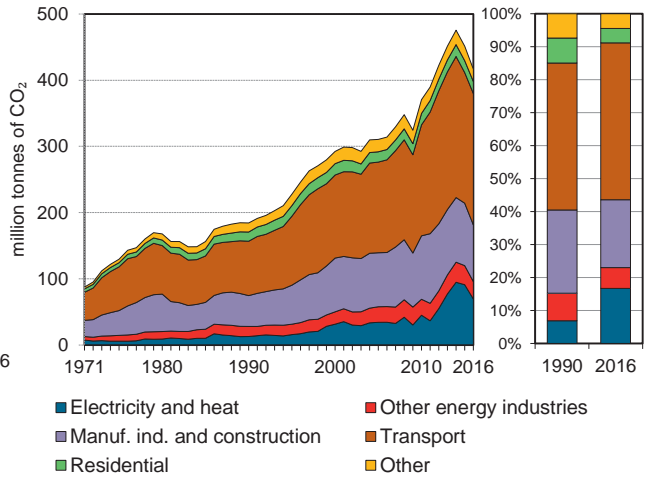


Figure 3. Electricity generation by fuel

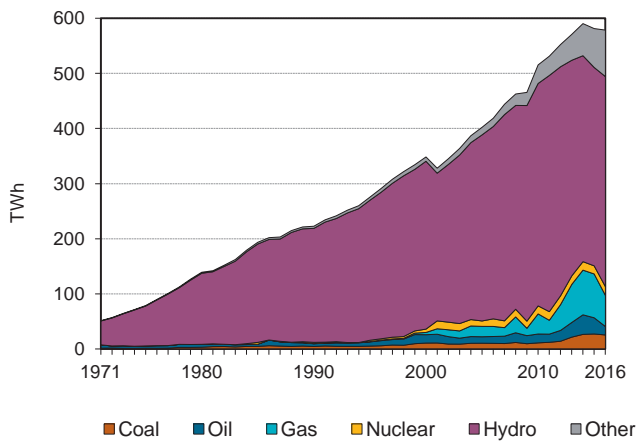


Figure 4. CO₂ from electricity generation: driving factors¹

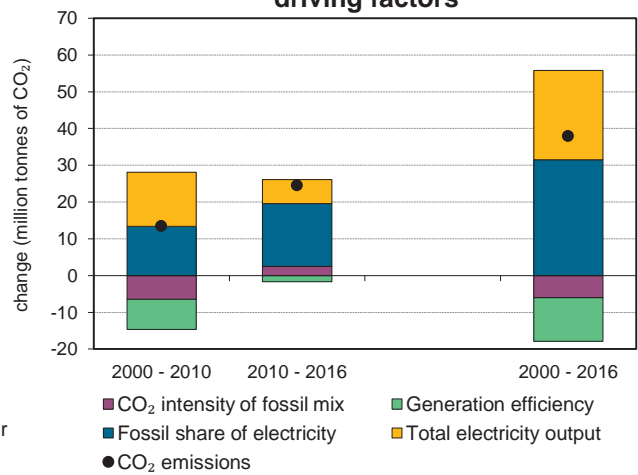


Figure 5. Changes in selected indicators

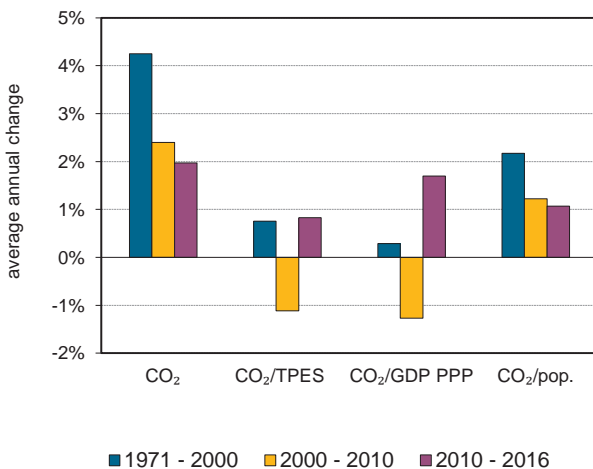
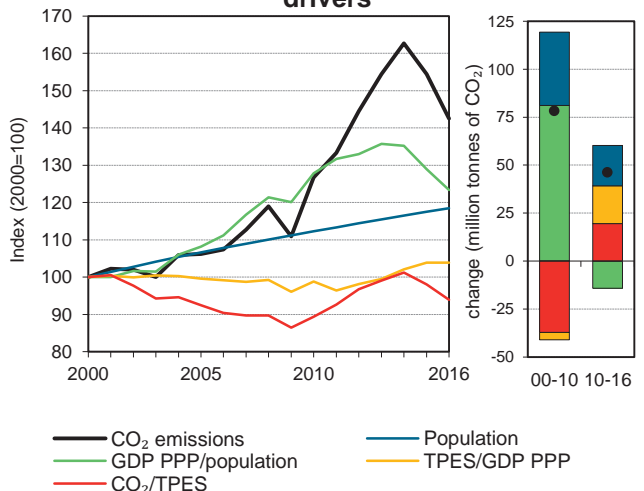


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Brazil

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	184.3	227.8	292.4	310.6	370.6	451.5	416.7	126%
Share of World CO ₂ from fuel combustion	0.9%	1.1%	1.3%	1.2%	1.2%	1.4%	1.3%	
TPES (PJ)	5870	6 745	7 848	9 016	11 132	12 360	11 912	103%
GDP (billion 2010 USD)	1192.7	1 387.3	1 538.7	1 774.8	2 208.9	2 331.9	2 248.1	88%
GDP PPP (billion 2010 USD)	1513.7	1 760.7	1 952.8	2 252.5	2 803.4	2 959.5	2 853.2	88%
Population (millions)	149.4	162.3	175.3	186.9	196.8	206.0	207.7	39%
CO ₂ / TPES (tCO ₂ per TJ)	31.4	33.8	37.3	34.4	33.3	36.5	35.0	11%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.16	0.2	0.2	0.2	0.2	0.2	0.2	19%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.12	0.1	0.2	0.1	0.1	0.2	0.1	20%
CO ₂ / population (tCO ₂ per capita)	1.2	1.4	1.7	1.7	1.9	2.2	2.0	63%
Share of electricity output from fossil fuels	5%	5%	9%	10%	12%	23%	17%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	57	57	90	85	87	157	120	110%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	124	159	169	201	245	226	126%
Population index	100	109	117	125	132	138	139	39%
GDP PPP per population index	100	107	110	119	141	142	136	36%
Energy intensity index - TPES / GDP PPP	100	99	104	103	102	108	108	8%
Carbon intensity index - CO ₂ / TPES	100	108	119	110	106	116	111	11%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	61.4	289.5	65.8	-	416.7	126%
Electricity and heat generation	34.4	9.8	25.4	-	69.5	445%
Other energy industry own use	1.6	12.3	12.5	-	26.3	73%
Manufacturing industries and construction	25.4	39.1	21.1	-	85.7	84%
Transport	-	192.8	5.7	-	198.5	141%
<i>of which: road</i>	-	177.4	3.5	-	181.0	154%
Other	-	35.5	1.2	-	36.7	33%
<i>of which: residential</i>	-	17.4	0.8	-	18.2	31%
<i>of which: services</i>	-	1.8	0.4	-	2.2	-14%
<i>Memo: international marine bunkers</i>	-	11.0	-	-	11.0	532%
<i>Memo: international aviation bunkers</i>	-	6.8	-	-	6.8	373%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	177.4	71.2	14.9	14.9
Manufacturing industries - oil	39.1	27.3	3.3	18.2
Manufacturing industries - coal	25.4	16.1	2.1	20.3
Manufacturing industries - gas	21.1	3.2	1.8	22.1
Main activity prod. elec. and heat - gas	19.4	0.0	1.6	23.7
Unallocated autoproducers - coal	18.5	4.3	1.6	25.3
Non-specified other - oil	18.2	13.5	1.5	26.8
Residential - oil	17.4	13.6	1.5	28.3
Main activity prod. elec. and heat - coal	15.9	4.1	1.3	29.6
<i>Memo: total CO₂ from fuel combustion</i>	<i>416.7</i>	<i>184.3</i>	<i>35.0</i>	<i>35.0</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Brunei Darussalam

Figure 1. CO₂ emissions by fuel

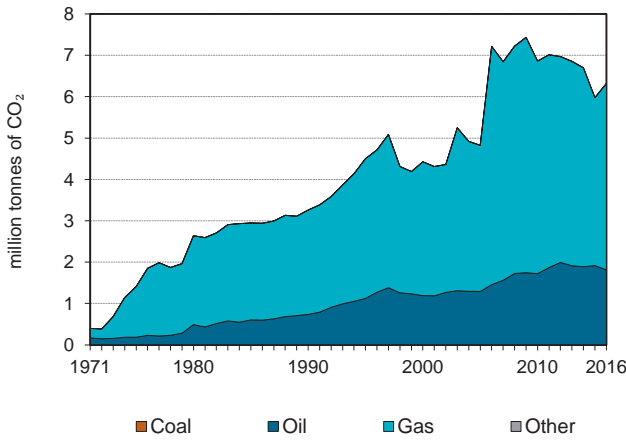


Figure 2. CO₂ emissions by sector

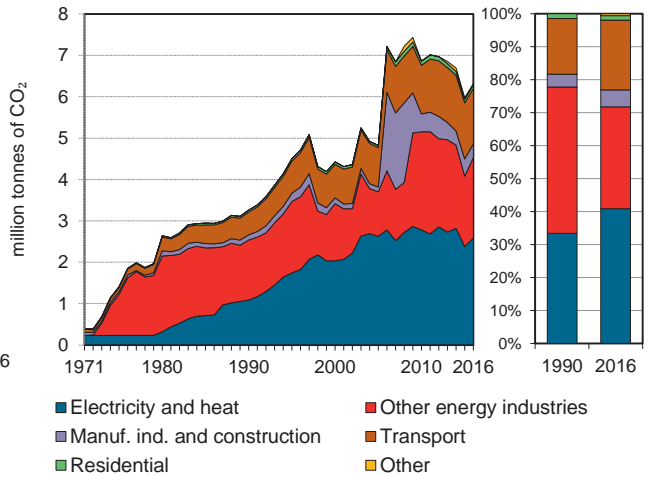


Figure 3. Electricity generation by fuel

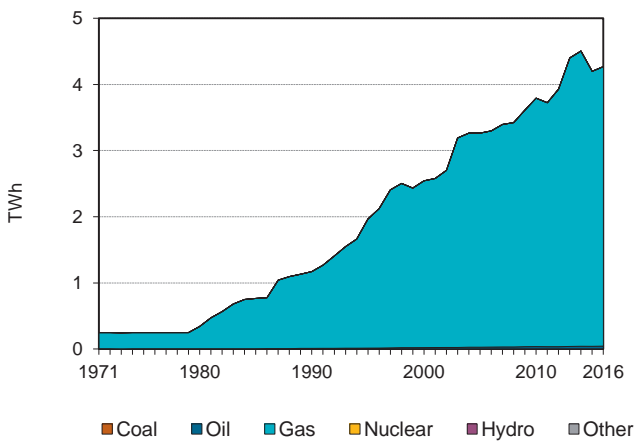


Figure 4. CO₂ from electricity generation: driving factors¹

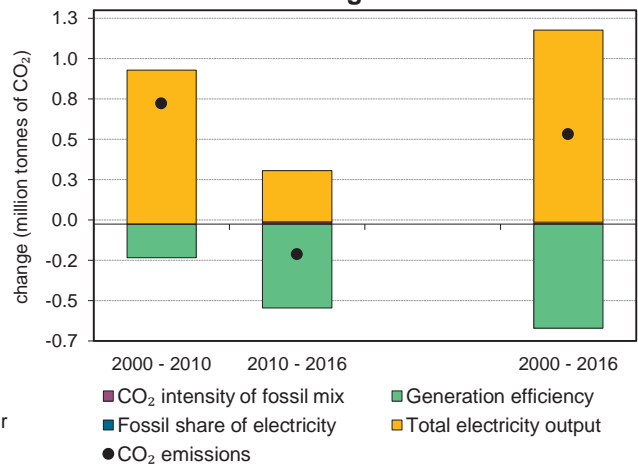


Figure 5. Changes in selected indicators

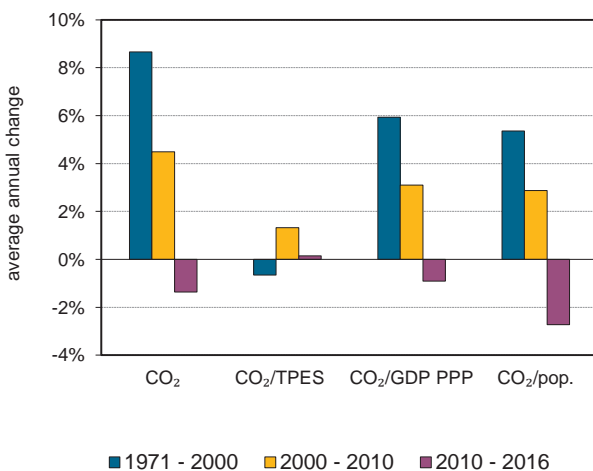
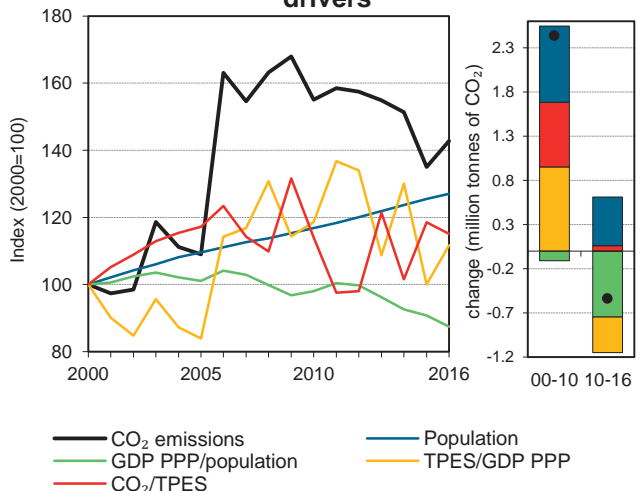


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Brunei Darussalam

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	3.3	4.5	4.4	4.8	6.9	6.0	6.3	94%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	72	94	100	93	136	114	124	71%
GDP (billion 2010 USD)	9.6	11.2	12.0	13.3	13.7	13.6	13.3	39%
GDP PPP (billion 2010 USD)	21.5	25.1	26.8	29.7	30.7	30.5	29.8	39%
Population (millions)	0.3	0.3	0.3	0.4	0.4	0.4	0.4	63%
CO ₂ / TPES (tCO ₂ per TJ)	45.1	47.8	44.3	51.9	50.6	52.5	51.0	13%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.34	0.4	0.4	0.4	0.5	0.4	0.5	40%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.15	0.2	0.2	0.2	0.2	0.2	0.2	39%
CO ₂ / population (tCO ₂ per capita)	12.6	15.2	13.3	13.2	17.6	14.3	14.9	19%
Share of electricity output from fossil fuels	100%	100%	100%	100%	100%	100%	100%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	929	885	799	805	734	567	605	-35%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	138	136	148	210	183	194	94%
Population index	100	115	129	141	150	161	163	63%
GDP PPP per population index	100	102	97	98	95	88	85	-15%
Energy intensity index - TPES / GDP PPP	100	111	111	93	131	111	124	24%
Carbon intensity index - CO ₂ / TPES	100	106	98	115	112	117	113	13%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	1.8	4.5	-	6.3	94%
Electricity and heat generation	-	0.0	2.5	-	2.6	138%
Other energy industry own use	-	0.0	1.9	-	1.9	34%
Manufacturing industries and construction	-	0.3	-	-	0.3	163%
Transport	-	1.3	-	-	1.3	142%
<i>of which: road</i>	-	1.3	-	-	1.3	142%
Other	-	0.1	0.0	-	0.1	166%
<i>of which: residential</i>	-	0.0	0.0	-	0.1	89%
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	0.1	-	-	0.1	5%
<i>Memo: international aviation bunkers</i>	-	0.2	-	-	0.2	106%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - gas	2.2	1.1	18.2	18.2
Other energy industry own use - gas	1.9	1.4	15.6	33.8
Road - oil	1.3	0.6	10.9	44.6
Manufacturing industries - oil	0.3	0.1	2.7	47.3
Unallocated autoproducers - gas	0.3	-	2.5	49.8
Residential - oil	0.0	0.0	0.4	50.2
Residential - gas	0.0	-	0.3	50.5
Non-specified other - oil	0.0	-	0.3	50.8
Main activity prod. elec. and heat - oil	0.0	0.0	0.3	51.1
<i>Memo: total CO₂ from fuel combustion</i>	6.3	3.3	51.3	51.3

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Bulgaria ¹

Figure 1. CO₂ emissions by fuel

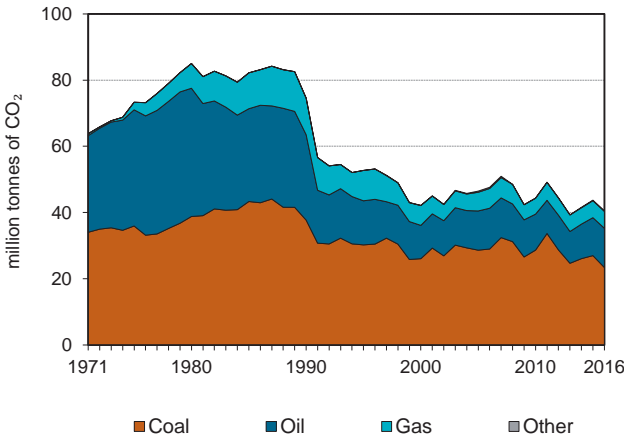


Figure 2. CO₂ emissions by sector

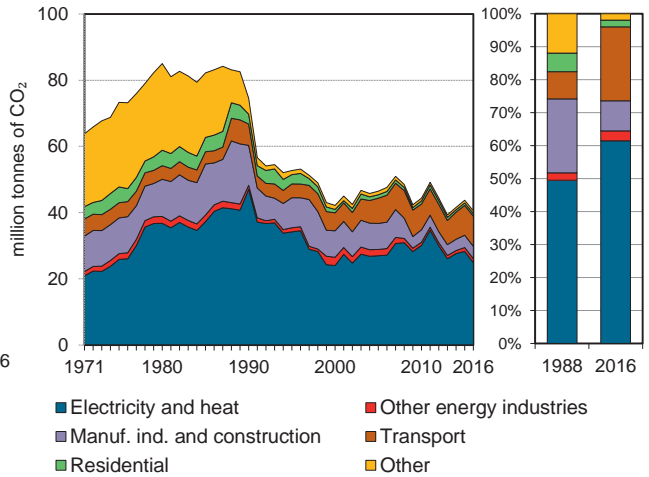


Figure 3. Electricity generation by fuel

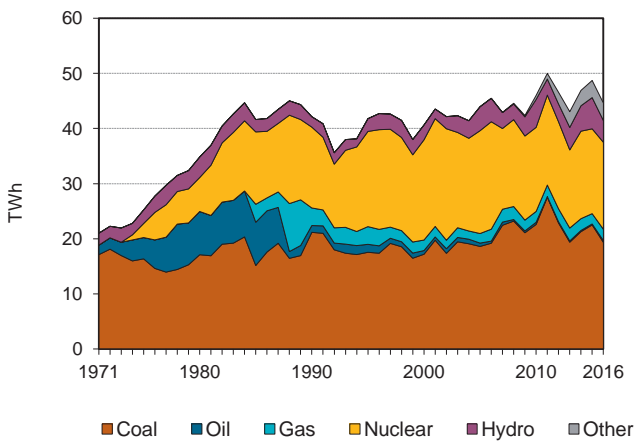


Figure 4. CO₂ from electricity generation: driving factors²

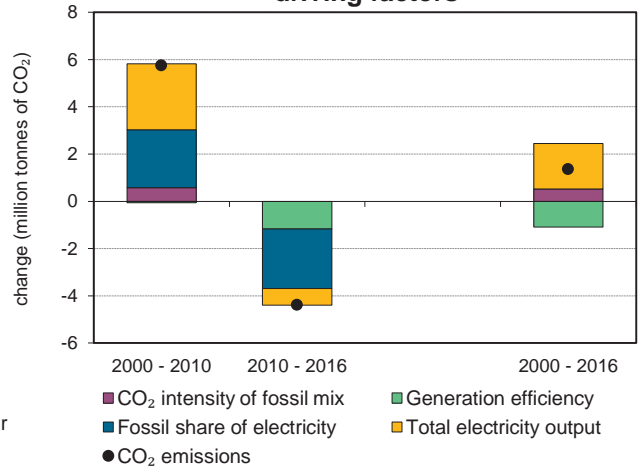


Figure 5. Changes in selected indicators

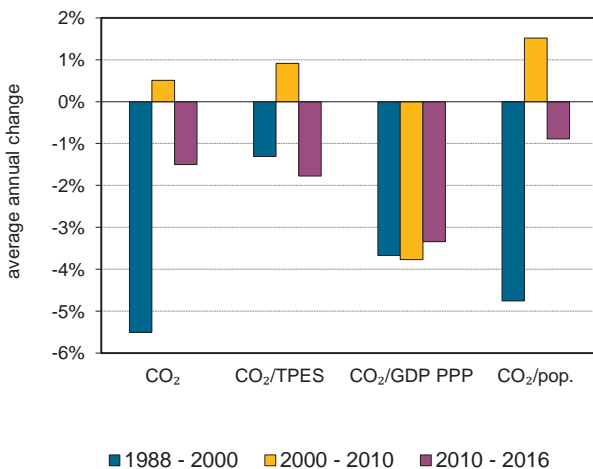
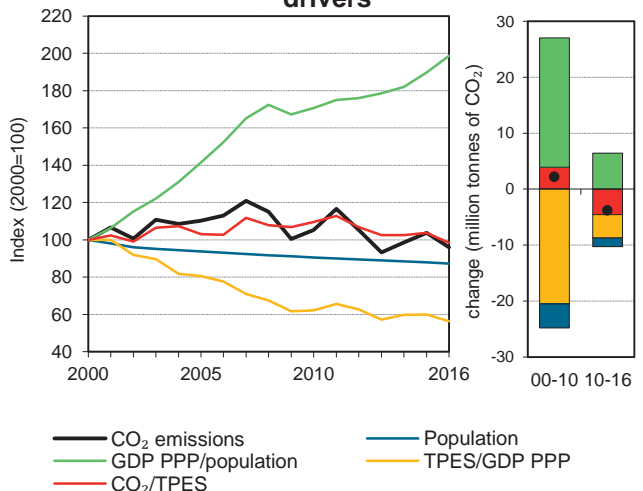


Figure 6. Total CO₂ emissions and drivers³



1. Under the Convention Bulgaria is allowed use 1988 as its base year.

2. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.

3. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Bulgaria ¹

Key indicators

	1988	1990	1995	2005	2010	2015	2016	%change 88-16
CO ₂ fuel combustion (MtCO ₂)	83.2	74.6	52.7	46.5	44.4	43.7	40.5	-51%
Share of World CO ₂ from fuel combustion	0.4%	0.4%	0.3%	0.2%	0.2%	0.1%	0.1%	
TPES (PJ)	1312	1 182	967	833	748	779	761	-42%
GDP (billion 2010 USD)	41.3	36.3	31.8	43.5	50.6	54.6	56.5	37%
GDP PPP (billion 2010 USD)	90.2	79.3	69.4	95.0	110.6	119.4	124.1	38%
Population (millions)	9	8.7	8.4	7.7	7.4	7.2	7.1	-21%
CO ₂ / TPES (tCO ₂ per TJ)	63.4	63.1	54.5	55.8	59.3	56.2	53.3	-16%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	2.01	2.1	1.7	1.1	0.9	0.8	0.7	-64%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.92	0.9	0.8	0.5	0.4	0.4	0.3	-65%
CO ₂ / population (tCO ₂ per capita)	9.3	8.6	6.3	6.1	6.0	6.1	5.7	-39%
Share of electricity output from fossil fuels	0%	61%	53%	48%	54%	50%	49%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	0	772	588	517	553	497	472	0%
CO₂ emissions and drivers - Kaya decomposition (1988=100) ²								
CO ₂ emissions index	100	90	63	56	53	53	49	-51%
Population index	100	97	94	85	82	80	79	-21%
GDP PPP per population index	100	91	82	123	149	166	173	73%
Energy intensity index - TPES / GDP PPP	100	102	96	60	47	45	42	-58%
Carbon intensity index - CO ₂ / TPES	100	100	86	88	94	89	84	-16%

1. Under the Convention Bulgaria is allowed use 1988 as its base year. 2. Please see Part I for methodological notes.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ³	Total	%change 88-16
CO₂ fuel combustion	23.4	11.8	5.1	0.2	40.5	-51%
Electricity and heat generation	22.0	0.9	1.9	-	24.9	-40%
Other energy industry own use	0.0	1.1	0.1	-	1.2	-35%
Manufacturing industries and construction	0.7	0.7	2.2	0.2	3.7	-80%
Transport	-	8.6	0.5	-	9.1	33%
<i>of which: road</i>	-	8.5	0.2	-	8.7	27%
Other	0.6	0.6	0.4	-	1.6	-89%
<i>of which: residential</i>	0.6	0.1	0.1	-	0.8	-83%
<i>of which: services</i>	0.0	0.1	0.2	-	0.3	x
<i>Memo: international marine bunkers</i>	-	0.2	-	-	0.2	-74%
<i>Memo: international aviation bunkers</i>	-	0.6	-	-	0.6	-50%

3. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1988 CO ₂ emissions (MtCO ₂)	Share in total GHG ⁴ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	22.0	24.4	37.9	37.9
Road - oil	8.5	6.9	14.6	52.4
Manufacturing industries - gas	2.2	-	3.7	56.1
Main activity prod. elec. and heat - gas	1.8	6.6	3.2	59.3
Other energy industry own use - oil	1.1	1.9	1.9	61.2
Main activity prod. elec. and heat - oil	0.9	8.2	1.5	62.7
Manufacturing industries - coal	0.7	11.3	1.2	63.9
Manufacturing industries - oil	0.7	7.3	1.2	65.1
Residential - coal	0.6	3.5	1.0	66.1
<i>Memo: total CO₂ from fuel combustion</i>	40.5	83.2	69.6	69.6

4. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Cambodia ¹

Figure 1. CO₂ emissions by fuel

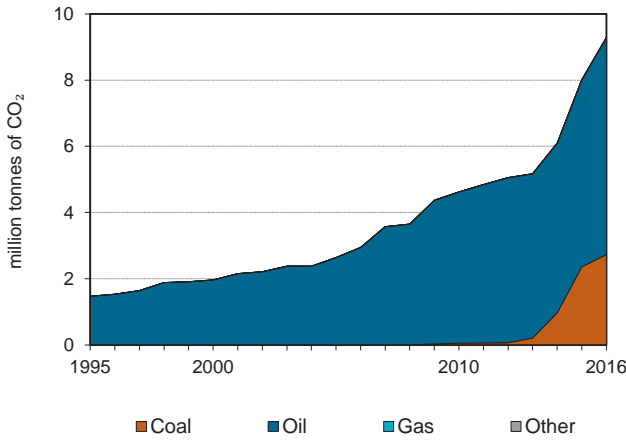


Figure 2. CO₂ emissions by sector

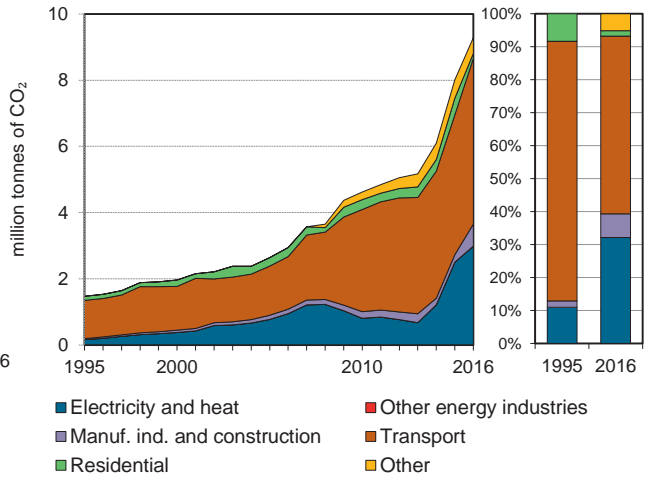


Figure 3. Electricity generation by fuel

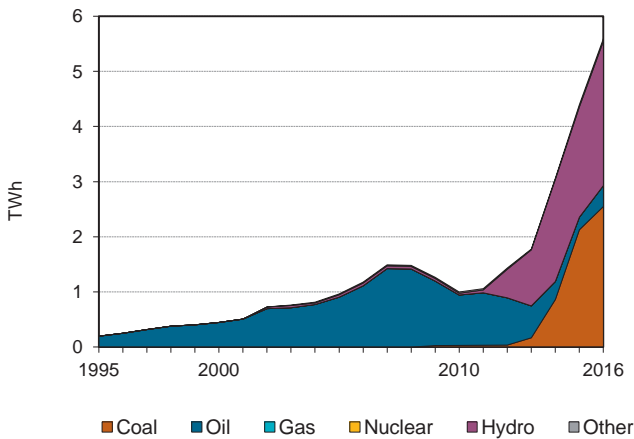


Figure 4. CO₂ from electricity generation: driving factors²

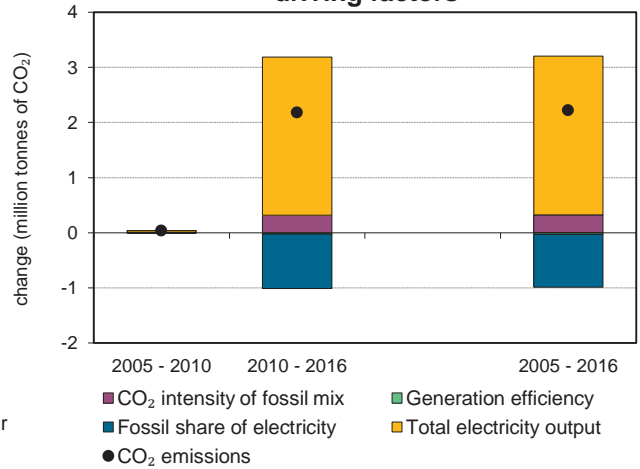


Figure 5. Changes in selected indicators

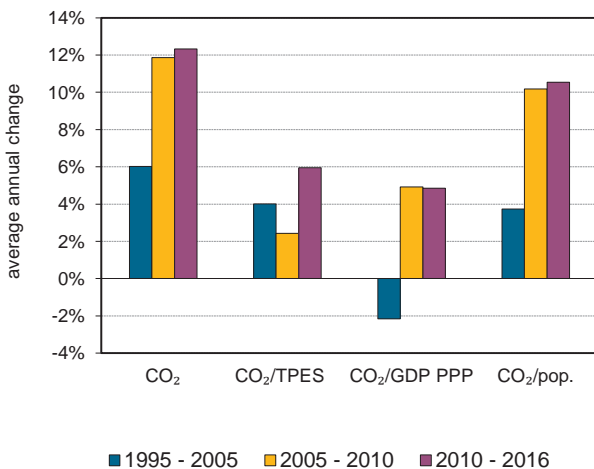
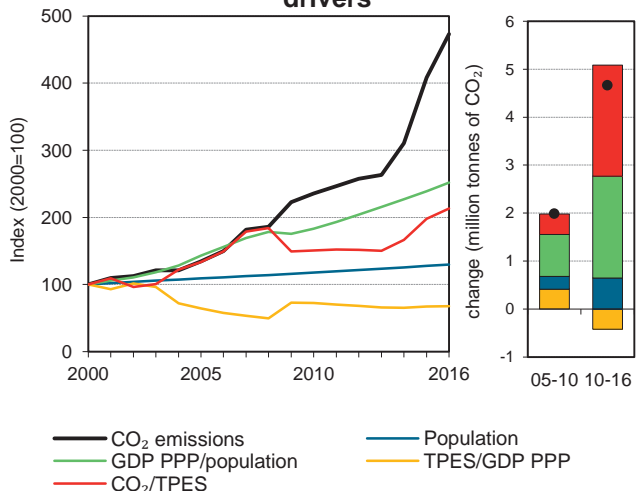


Figure 6. Total CO₂ emissions and drivers³



1. Prior to 1995, data for Cambodia were included in Other Asia.

2. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.

3. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Cambodia ¹

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 95-16
CO ₂ fuel combustion (MtCO ₂)	..	1.5	2.0	2.6	4.6	8.0	9.3	531%
Share of World CO ₂ from fuel combustion	..	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	..	119	143	144	223	295	317	167%
GDP (billion 2010 USD)	..	3.7	5.2	8.1	11.2	15.9	17.0	365%
GDP PPP (billion 2010 USD)	..	11.5	16.4	25.6	35.4	50.0	53.5	365%
Population (millions)	..	10.7	12.2	13.3	14.3	15.5	15.8	48%
CO ₂ / TPES (tCO ₂ per TJ)	..	12.4	13.7	18.4	20.7	27.2	29.3	136%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	..	0.4	0.4	0.3	0.4	0.5	0.5	36%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	..	0.1	0.1	0.1	0.1	0.2	0.2	36%
CO ₂ / population (tCO ₂ per capita)	..	0.1	0.2	0.2	0.3	0.5	0.6	327%
Share of electricity output from fossil fuels	..	100%	100%	94%	95%	54%	52%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	..	813	843	801	808	569	534	-34%
CO₂ emissions and drivers - Kaya decomposition (1995=100) ²								
CO ₂ emissions index	..	100	133	179	314	545	631	531%
Population index	..	100	114	125	134	146	148	48%
GDP PPP per population index	..	100	125	179	229	298	314	214%
Energy intensity index - TPES / GDP PPP	..	100	85	54	61	57	57	-43%
Carbon intensity index - CO ₂ / TPES	..	100	111	148	167	220	236	136%

1. Prior to 1995, data for Cambodia were included in Other Asia. 2. Please see Part I for methodological notes.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ³	Total	%change 95-16
CO₂ fuel combustion	2.7	6.6	-	-	9.3	531%
Electricity and heat generation	2.7	0.3	-	-	3.0	+
Other energy industry own use	-	-	-	-	-	-
Manufacturing industries and construction	0.1	0.6	-	-	0.7	+
Transport	-	5.0	-	-	5.0	332%
<i>of which: road</i>	-	4.2	-	-	4.2	286%
Other	-	0.6	-	-	0.6	411%
<i>of which: residential</i>	-	0.1	-	-	0.1	22%
<i>of which: services</i>	-	0.3	-	-	0.3	x
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.3	-	-	0.3	760%

3. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ⁴ (%)	Cumulative total (%)
Road - oil	4.2	1.1	11.0	11.0
Main activity prod. elec. and heat - coal	2.7	-	7.1	18.1
Other transport - oil	0.9	0.1	2.3	20.4
Manufacturing industries - oil	0.6	0.0	1.6	22.0
Non-specified other - oil	0.5	-	1.3	23.3
Main activity prod. elec. and heat - oil	0.3	0.2	0.9	24.1
Residential - oil	0.1	0.1	0.4	24.5
Manufacturing industries - coal	0.1	-	0.2	24.7
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	9.3	..	24.7	24.7

4. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Cameroon

Figure 1. CO₂ emissions by fuel

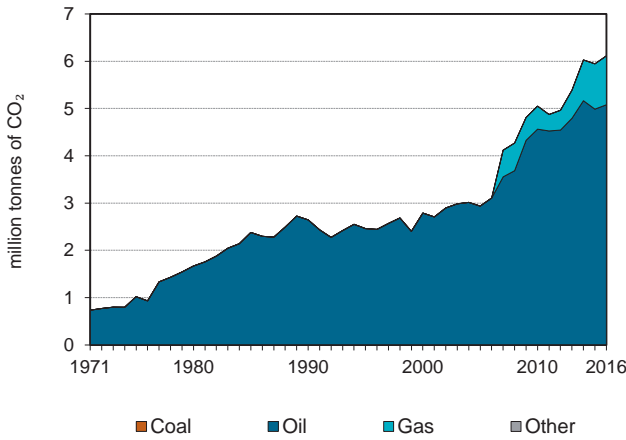


Figure 2. CO₂ emissions by sector

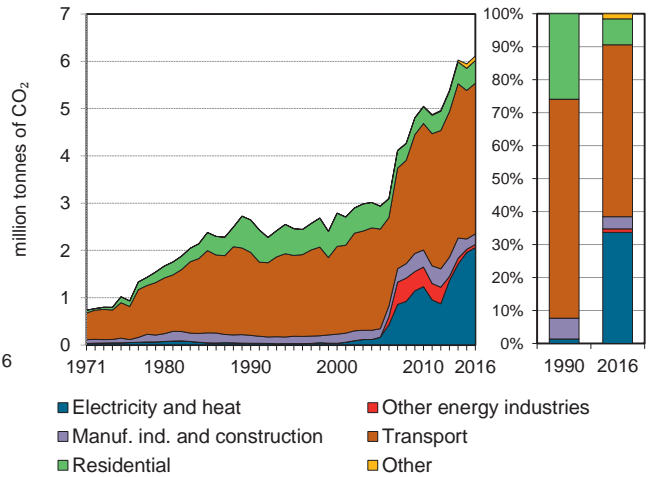


Figure 3. Electricity generation by fuel

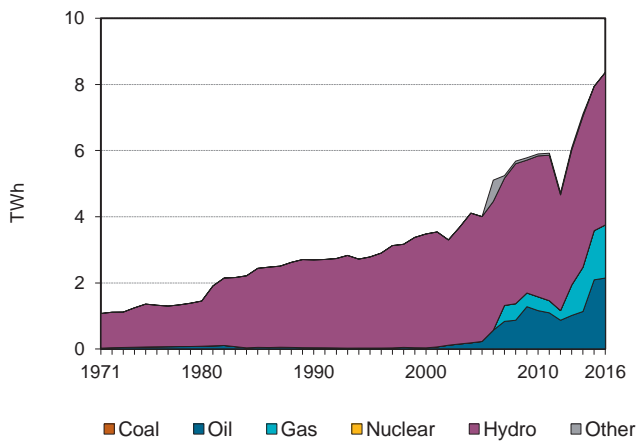


Figure 4. CO₂ from electricity generation: driving factors¹

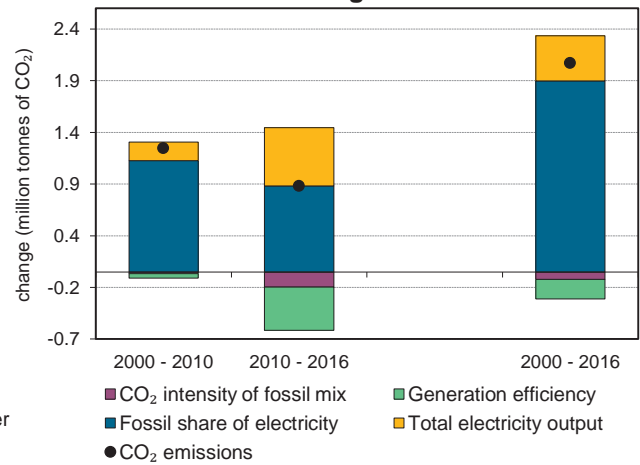


Figure 5. Changes in selected indicators

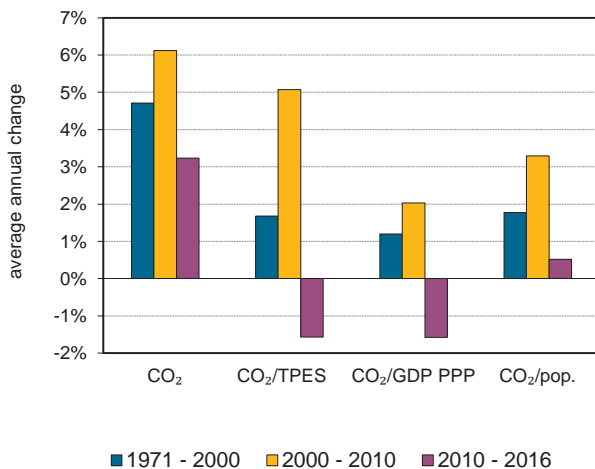
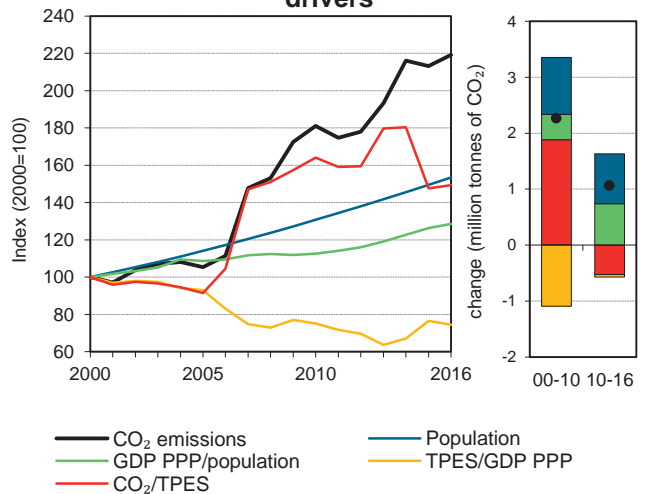


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Cameroon

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	2.6	2.5	2.8	2.9	5.1	5.9	6.1	131%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	209	232	264	304	292	382	388	86%
GDP (billion 2010 USD)	14.9	13.6	17.1	20.5	23.6	30.4	31.8	114%
GDP PPP (billion 2010 USD)	34.7	31.4	39.0	48.3	57.3	73.6	76.9	122%
Population (millions)	11.7	13.5	15.3	17.4	20.0	22.8	23.4	100%
CO ₂ / TPES (tCO ₂ per TJ)	12.7	10.6	10.6	9.6	17.3	15.6	15.7	24%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.18	0.2	0.2	0.1	0.2	0.2	0.2	8%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.08	0.1	0.1	0.1	0.1	0.1	0.1	5%
CO ₂ / population (tCO ₂ per capita)	0.2	0.2	0.2	0.2	0.3	0.3	0.3	15%
Share of electricity output from fossil fuels	2%	1%	1%	6%	27%	45%	45%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	13	10	10	41	209	246	246	1781%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	93	105	111	191	225	231	131%
Population index	100	115	130	149	170	195	200	100%
GDP PPP per population index	100	79	86	94	97	109	111	11%
Energy intensity index - TPES / GDP PPP	100	123	113	105	85	86	84	-16%
Carbon intensity index - CO ₂ / TPES	100	84	83	76	137	123	124	24%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	5.1	1.0	-	6.1	131%
Electricity and heat generation	-	1.0	1.0	-	2.1	+
Other energy industry own use	-	0.1	-	-	0.1	x
Manufacturing industries and construction	-	0.2	-	-	0.2	34%
Transport	-	3.2	-	-	3.2	82%
<i>of which: road</i>	-	3.2	-	-	3.2	81%
Other	-	0.6	-	-	0.6	-16%
<i>of which: residential</i>	-	0.5	-	-	0.5	-30%
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-100%
<i>Memo: international aviation bunkers</i>	-	0.3	-	-	0.3	110%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	3.2	1.8	6.8	6.8
Unallocated autoproducers - gas	1.0	-	2.2	9.0
Unallocated autoproducers - oil	0.8	-	1.6	10.6
Residential - oil	0.5	0.7	1.0	11.7
Main activity prod. elec. and heat - oil	0.3	0.0	0.6	12.2
Manufacturing industries - oil	0.2	0.2	0.5	12.7
Non-specified other - oil	0.1	-	0.2	12.9
Other energy industry own use - oil	0.1	-	0.1	13.0
Other transport - oil	0.0	-	0.0	13.1
<i>Memo: total CO₂ from fuel combustion</i>	6.1	2.6	13.1	13.1

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Canada

Figure 1. CO₂ emissions by fuel

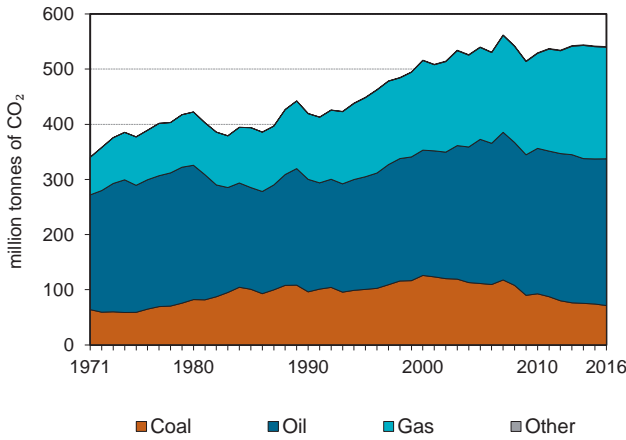


Figure 2. CO₂ emissions by sector

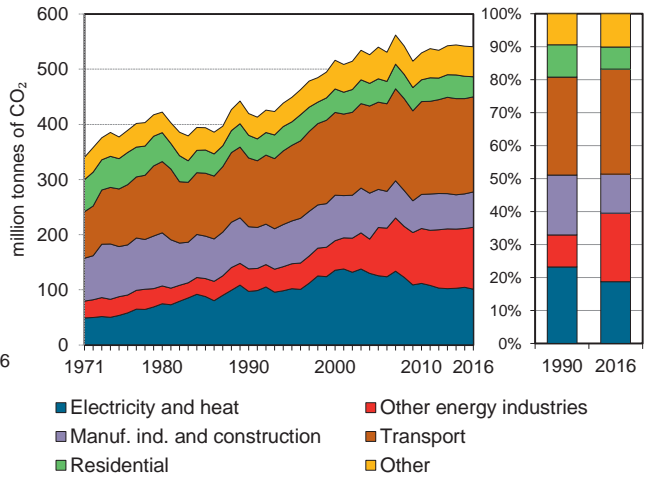


Figure 3. Electricity generation by fuel

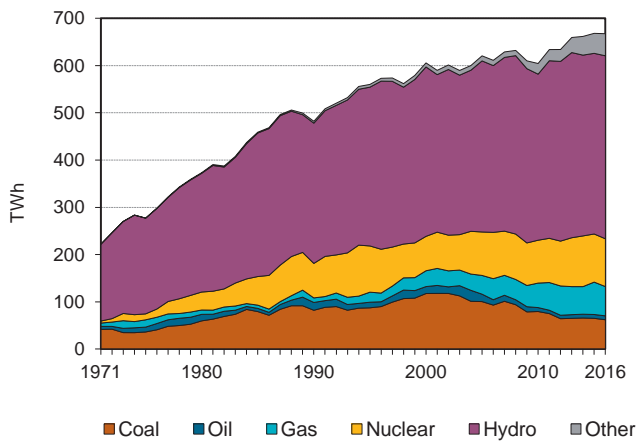


Figure 4. CO₂ from electricity generation: driving factors¹

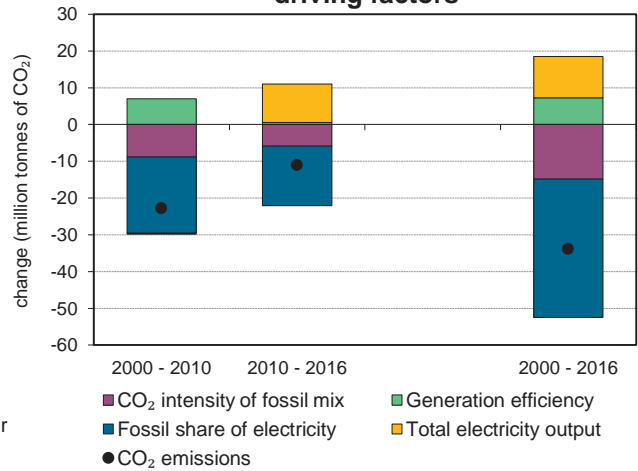


Figure 5. Changes in selected indicators

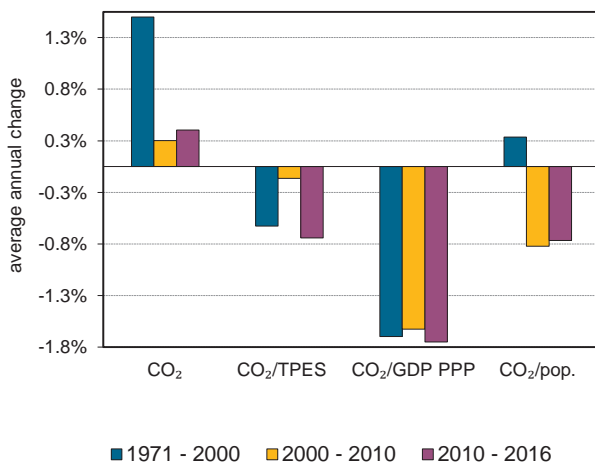
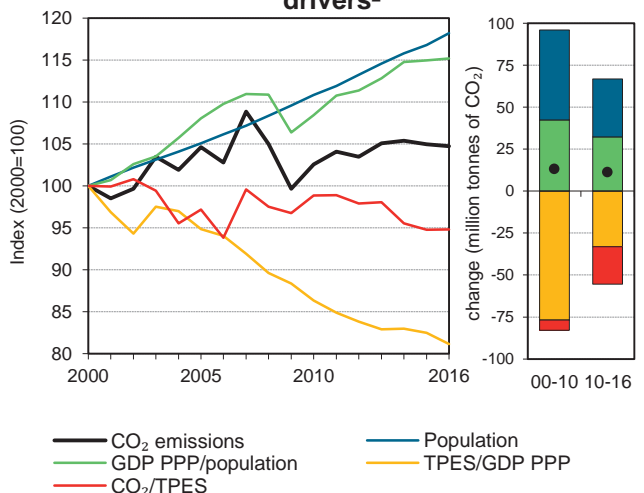


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Canada

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	419.6	449.0	516.3	540.0	529.5	541.8	540.8	29%
Share of World CO ₂ from fuel combustion	2.1%	2.1%	2.2%	2.0%	1.7%	1.7%	1.7%	
TPES (PJ)	8846	9 791	10 616	11 430	11 014	11 756	11 727	33%
GDP (billion 2010 USD)	1014.1	1 102.8	1 342.7	1 524.5	1 613.5	1 802.5	1 828.0	80%
GDP PPP (billion 2010 USD)	855.5	930.3	1 132.7	1 286.1	1 361.1	1 520.6	1 542.1	80%
Population (millions)	27.7	29.3	30.7	32.2	34.0	35.8	36.3	31%
CO ₂ / TPES (tCO ₂ per TJ)	47.4	45.9	48.6	47.2	48.1	46.1	46.1	-3%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.41	0.4	0.4	0.4	0.3	0.3	0.3	-29%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.49	0.5	0.5	0.4	0.4	0.4	0.4	-28%
CO ₂ / population (tCO ₂ per capita)	15.2	15.3	16.8	16.7	15.6	15.1	14.9	-2%
Share of electricity output from fossil fuels	23%	22%	27%	25%	23%	21%	20%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	200	179	220	198	183	154	149	-25%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	107	123	129	126	129	129	29%
Population index	100	106	111	116	123	129	131	31%
GDP PPP per population index	100	103	119	129	130	137	138	38%
Energy intensity index - TPES / GDP PPP	100	102	91	86	78	75	74	-26%
Carbon intensity index - CO ₂ / TPES	100	97	103	100	101	97	97	-3%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	71.3	266.1	202.3	1.1	540.8	29%
Electricity and heat generation	58.7	7.4	34.8	0.2	101.2	4%
Other energy industry own use	-	44.8	67.5	-	112.2	174%
Manufacturing industries and construction	12.6	18.0	32.6	0.9	64.0	-16%
Transport	-	163.8	8.5	-	172.4	38%
<i>of which: road</i>	-	137.5	0.1	-	137.6	42%
Other	0.0	32.0	58.9	-	90.9	13%
<i>of which: residential</i>	0.0	5.5	31.0	-	36.5	-11%
<i>of which: services</i>	-	10.9	25.9	-	36.9	15%
<i>Memo: international marine bunkers</i>	-	1.3	-	-	1.3	-54%
<i>Memo: international aviation bunkers</i>	-	1.9	-	-	1.9	-30%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	137.5	96.5	18.9	18.9
Other energy industry own use - gas	67.5	20.9	9.3	28.1
Main activity prod. elec. and heat - coal	58.7	80.4	8.1	36.2
Other energy industry own use - oil	44.8	19.6	6.1	42.3
Manufacturing industries - gas	32.6	39.6	4.5	46.8
Residential - gas	31.0	26.7	4.3	51.1
Non-specified other - gas	27.9	20.7	3.8	54.9
Non-specified other - oil	26.6	18.7	3.6	58.6
Other transport - oil	26.3	21.3	3.6	62.2
<i>Memo: total CO₂ from fuel combustion</i>	<i>540.8</i>	<i>419.6</i>	<i>74.2</i>	<i>74.2</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Chile

Figure 1. CO₂ emissions by fuel

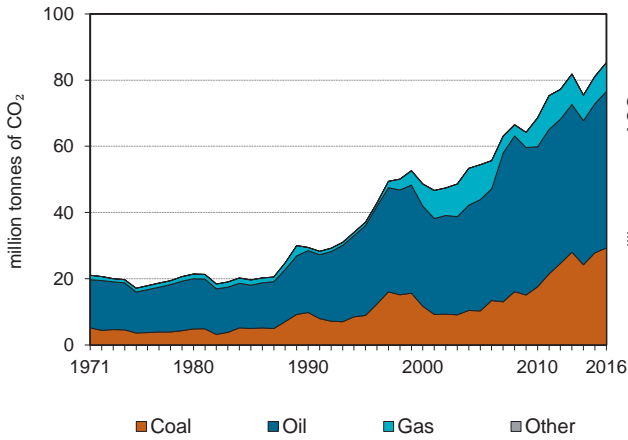


Figure 2. CO₂ emissions by sector

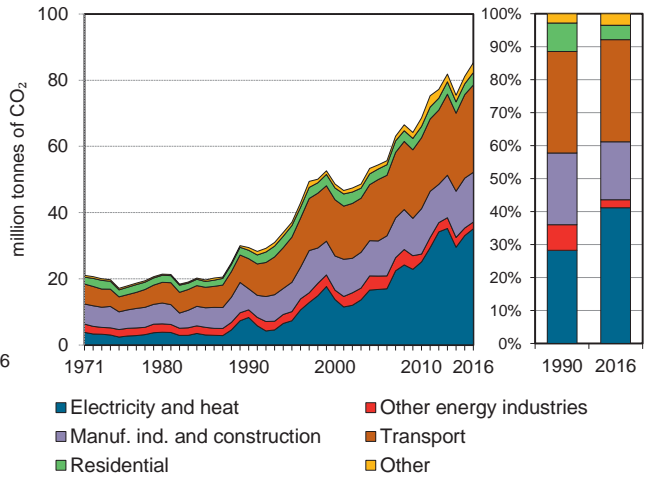


Figure 3. Electricity generation by fuel

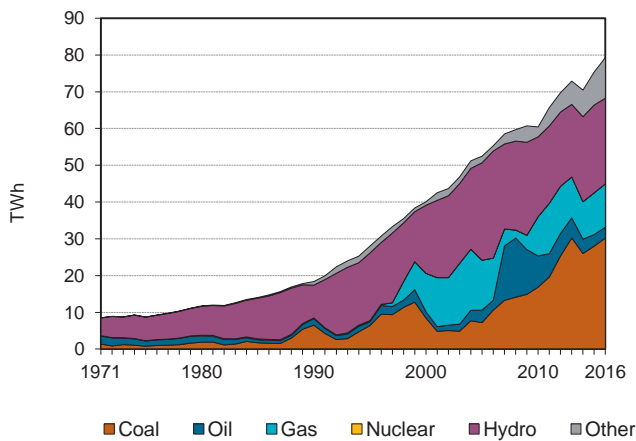


Figure 4. CO₂ from electricity generation: driving factors¹

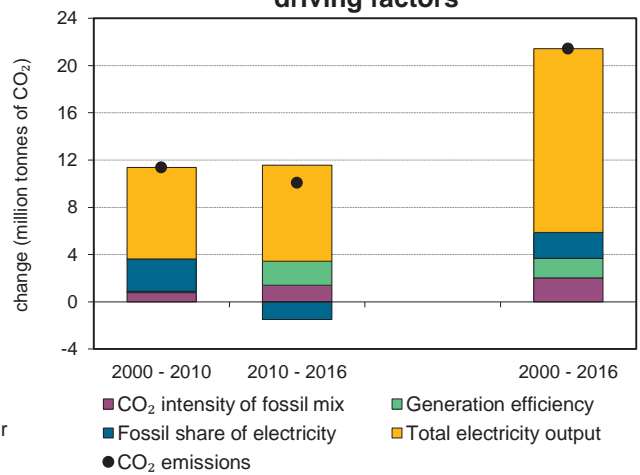


Figure 5. Changes in selected indicators

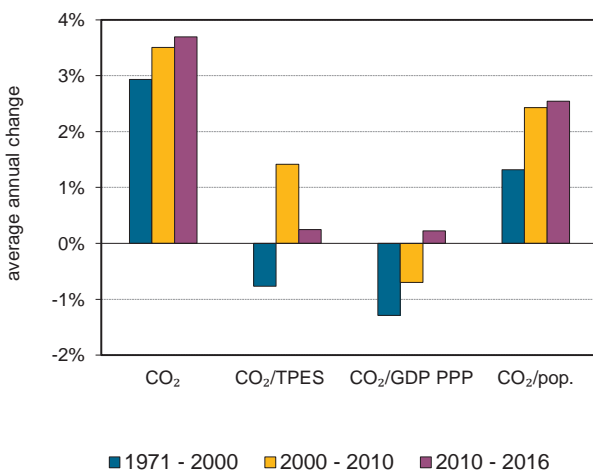
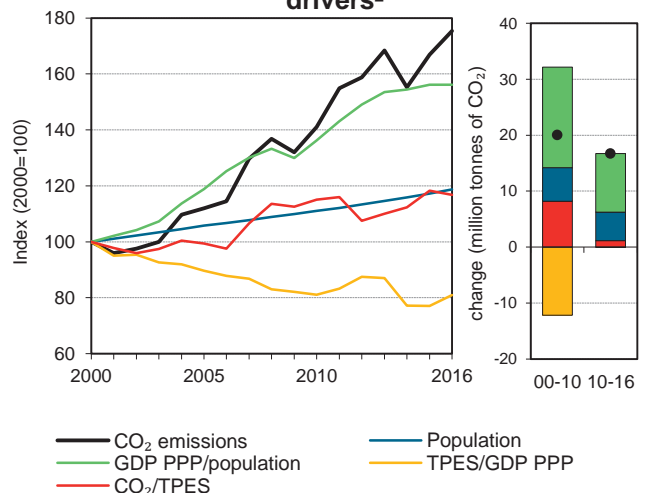


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Chile

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	29.4	37.1	48.6	54.4	68.6	81.2	85.3	190%
Share of World CO ₂ from fuel combustion	0.1%	0.2%	0.2%	0.2%	0.2%	0.3%	0.3%	
TPES (PJ)	587	768	1 054	1 188	1 292	1 487	1 582	170%
GDP (billion 2010 USD)	75.5	114.5	144.5	181.7	218.5	264.6	267.9	255%
GDP PPP (billion 2010 USD)	107.2	162.6	205.3	258.0	310.4	375.7	380.5	255%
Population (millions)	13.2	14.4	15.4	16.3	17.1	18.0	18.3	39%
CO ₂ / TPES (tCO ₂ per TJ)	50.2	48.3	46.1	45.8	53.1	54.6	53.9	7%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.39	0.3	0.3	0.3	0.3	0.3	0.3	-18%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.28	0.2	0.2	0.2	0.2	0.2	0.2	-19%
CO ₂ / population (tCO ₂ per capita)	2.2	2.6	3.2	3.3	4.0	4.5	4.7	109%
Share of electricity output from fossil fuels	46%	28%	52%	46%	60%	56%	57%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	452	261	342	320	415	438	443	-2%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	126	165	185	233	276	290	190%
Population index	100	109	117	124	130	137	139	39%
GDP PPP per population index	100	139	164	195	223	256	256	156%
Energy intensity index - TPES / GDP PPP	100	86	94	84	76	72	76	-24%
Carbon intensity index - CO ₂ / TPES	100	96	92	91	106	109	107	7%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	29.3	47.3	8.7	-	85.3	190%
Electricity and heat generation	27.5	2.6	5.0	-	35.1	323%
Other energy industry own use	0.8	0.9	0.3	-	2.0	-12%
Manufacturing industries and construction	0.9	12.2	1.9	-	15.0	136%
Transport	-	26.3	0.1	-	26.4	190%
<i>of which: road</i>	-	23.7	0.1	-	23.8	203%
Other	0.0	5.3	1.4	-	6.7	100%
<i>of which: residential</i>	0.0	2.7	1.1	-	3.8	48%
<i>of which: services</i>	0.0	1.8	0.3	-	2.1	418%
<i>Memo: international marine bunkers</i>	-	0.4	-	-	0.4	-27%
<i>Memo: international aviation bunkers</i>	-	1.7	-	-	1.7	206%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	27.5	4.5	22.5	22.5
Road - oil	23.7	7.8	19.4	41.9
Manufacturing industries - oil	12.2	4.2	10.0	51.9
Main activity prod. elec. and heat - gas	4.9	0.1	4.0	55.9
Residential - oil	2.7	2.1	2.2	58.1
Non-specified other - oil	2.7	0.6	2.2	60.3
Other transport - oil	2.6	1.3	2.1	62.4
Main activity prod. elec. and heat - oil	2.2	0.8	1.8	64.2
Manufacturing industries - gas	1.9	0.0	1.6	65.8
<i>Memo: total CO₂ from fuel combustion</i>	<i>85.3</i>	<i>29.4</i>	<i>69.8</i>	<i>69.8</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

People's Republic of China

Figure 1. CO₂ emissions by fuel

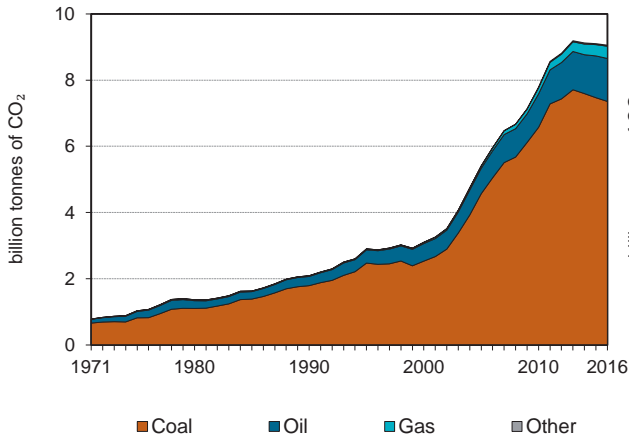


Figure 2. CO₂ emissions by sector

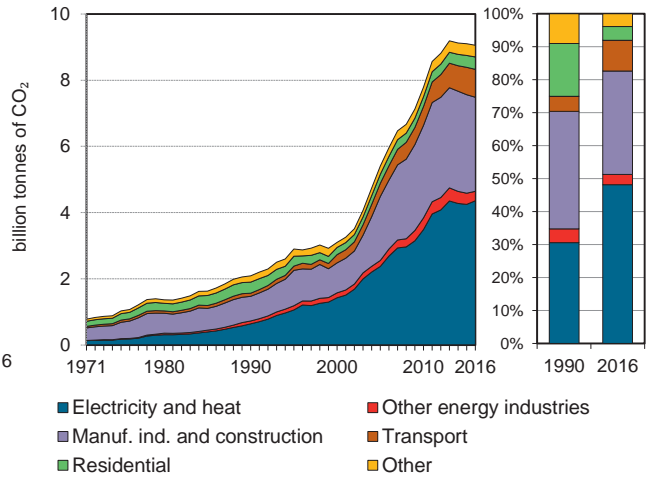


Figure 3. Electricity generation by fuel

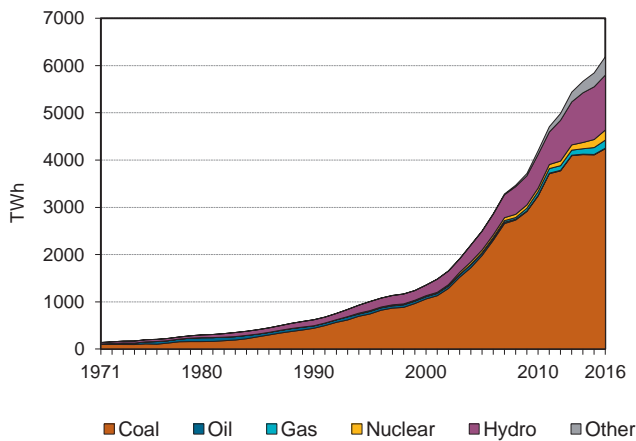


Figure 4. CO₂ from electricity generation: driving factors¹

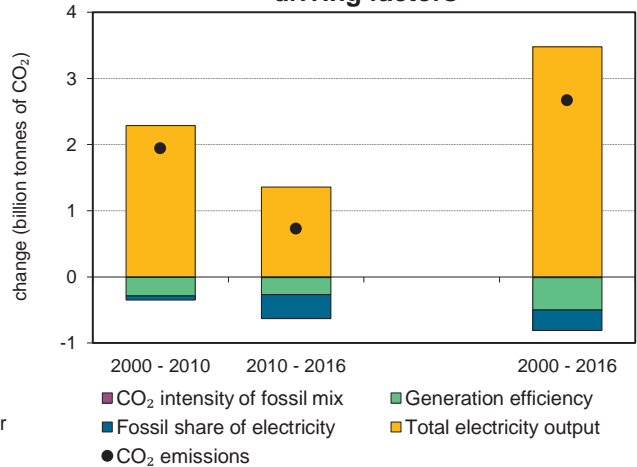


Figure 5. Changes in selected indicators

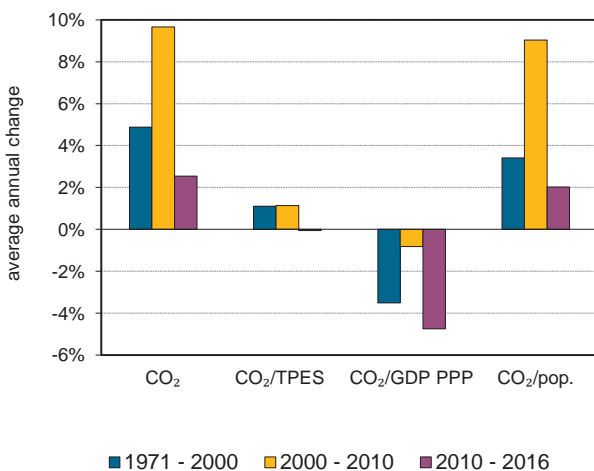
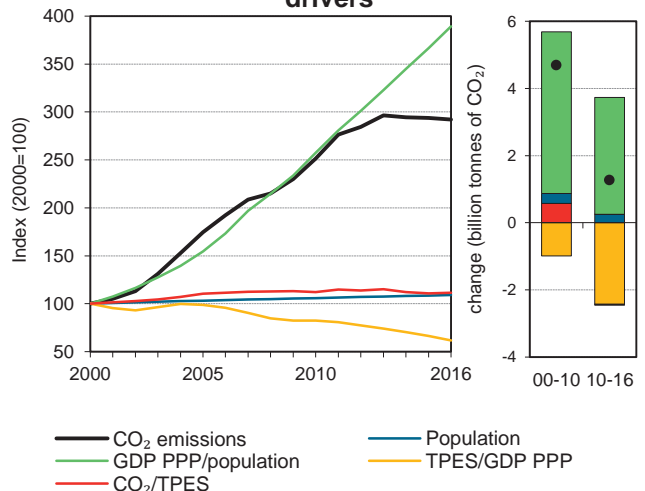


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

People's Republic of China

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	2088.9	2 900.3	3 099.7	5 406.5	7 791.6	9 102.7	9 056.8	334%
Share of World CO ₂ from fuel combustion	10.2%	13.6%	13.4%	20.0%	25.6%	28.2%	28.0%	
TPES (PJ)	36578	43 729	47 306	74 585	106 186	125 245	123 846	239%
GDP (billion 2010 USD)	829.6	1 479.0	2 237.1	3 569.9	6 100.6	8 908.3	9 505.2	1046%
GDP PPP (billion 2010 USD)	1697.7	3 026.8	4 578.2	7 305.7	12 485.0	18 230.9	19 450.4	1046%
Population (millions)	1135.2	1 204.9	1 262.6	1 303.7	1 337.7	1 371.2	1 378.7	21%
CO ₂ / TPES (tCO ₂ per TJ)	57.1	66.3	65.5	72.5	73.4	72.7	73.1	28%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	2.52	2.0	1.4	1.5	1.3	1.0	1.0	-62%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	1.23	1.0	0.7	0.7	0.6	0.5	0.5	-62%
CO ₂ / population (tCO ₂ per capita)	1.8	2.4	2.5	4.1	5.8	6.6	6.6	257%
Share of electricity output from fossil fuels	80%	80%	82%	82%	80%	73%	72%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	912	916	893	845	749	650	627	-31%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	139	148	259	373	436	434	334%
Population index	100	106	111	115	118	121	121	21%
GDP PPP per population index	100	168	242	375	624	889	943	843%
Energy intensity index - TPES / GDP PPP	100	67	48	47	39	32	30	-70%
Carbon intensity index - CO ₂ / TPES	100	116	115	127	128	127	128	28%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	7 357.9	1 298.0	370.4	30.4	9 056.8	334%
Electricity and heat generation	4 224.2	25.3	78.4	30.4	4 358.3	582%
Other energy industry own use	137.3	98.0	50.5	-	285.8	232%
Manufacturing industries and construction	2 577.5	164.9	99.9	-	2 842.4	281%
Transport	0.1	802.5	40.9	-	843.5	795%
<i>of which: road</i>	-	657.8	40.1	-	697.9	+
Other	418.9	207.3	100.6	-	726.8	39%
<i>of which: residential</i>	192.9	106.6	74.6	-	374.1	12%
<i>of which: services</i>	78.9	46.4	25.8	-	151.0	201%
<i>Memo: international marine bunkers</i>	-	31.3	-	-	31.3	621%
<i>Memo: international aviation bunkers</i>	-	25.8	-	-	25.8	+

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	3949.7	583.6	30.3	30.3
Manufacturing industries - coal	2577.5	676.0	19.7	50.0
Road - oil	657.8	58.5	5.0	55.0
Unallocated autoproducers - coal	274.5	1.4	2.1	57.1
Non-specified other sectors - coal	226.0	129.6	1.7	58.9
Residential - coal	192.9	322.4	1.5	60.3
Manufacturing industries - oil	164.9	63.3	1.3	61.6
Other transport - oil	144.7	9.5	1.1	62.7
Other energy industry - coal	137.3	51.8	1.1	63.8
<i>Memo: total CO₂ from fuel combustion</i>	<i>9056.8</i>	<i>2088.9</i>	<i>69.4</i>	<i>69.4</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Colombia

Figure 1. CO₂ emissions by fuel

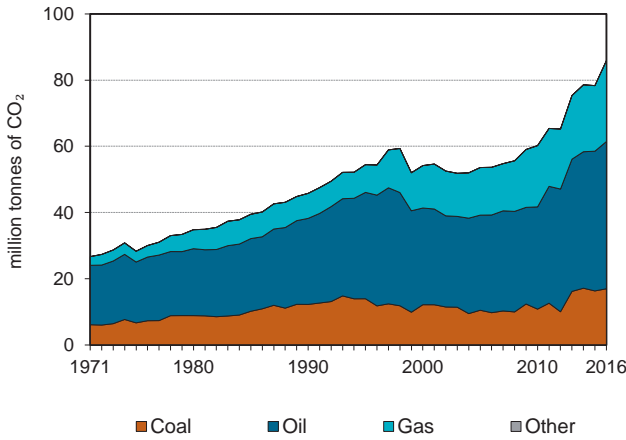


Figure 2. CO₂ emissions by sector

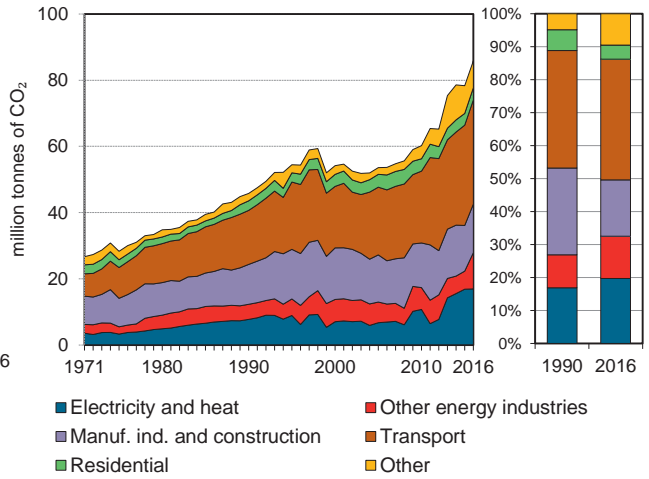


Figure 3. Electricity generation by fuel

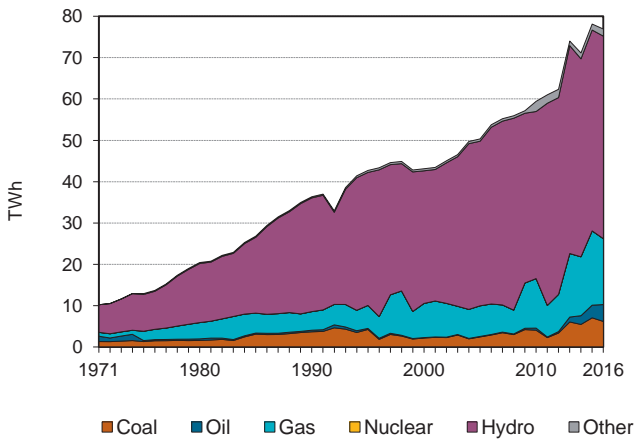


Figure 4. CO₂ from electricity generation: driving factors¹

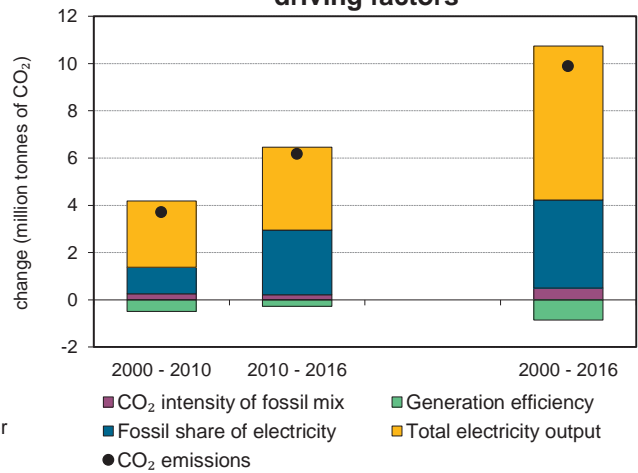


Figure 5. Changes in selected indicators

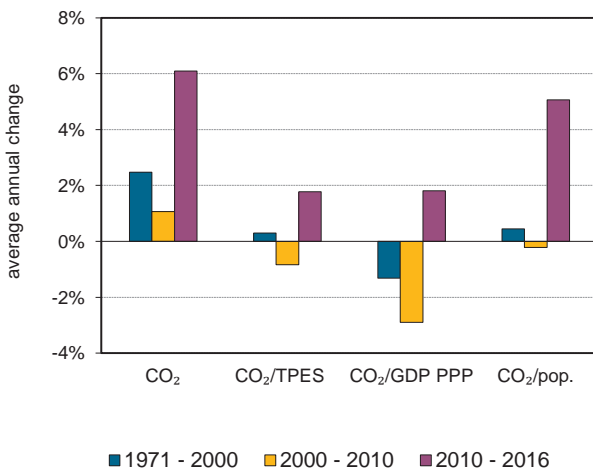
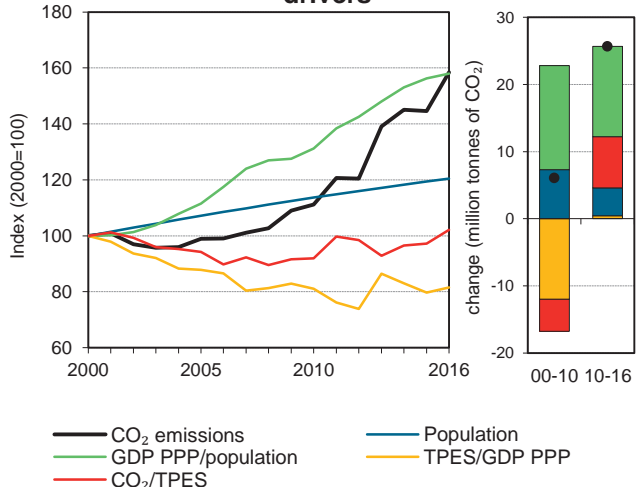


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Colombia

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	45.8	54.5	54.2	53.6	60.2	78.3	85.9	88%
Share of World CO ₂ from fuel combustion	0.2%	0.3%	0.2%	0.2%	0.2%	0.2%	0.3%	
TPES (PJ)	1014	1 156	1 081	1 134	1 306	1 608	1 677	65%
GDP (billion 2010 USD)	148.1	181.3	192.5	229.9	287.0	359.1	366.2	147%
GDP PPP (billion 2010 USD)	253	309.7	328.9	392.9	490.4	613.6	625.6	147%
Population (millions)	34.3	37.4	40.4	43.3	45.9	48.2	48.7	42%
CO ₂ / TPES (tCO ₂ per TJ)	45.2	47.1	50.1	47.3	46.1	48.7	51.2	13%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.31	0.3	0.3	0.2	0.2	0.2	0.2	-24%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.18	0.2	0.2	0.1	0.1	0.1	0.1	-24%
CO ₂ / population (tCO ₂ per capita)	1.3	1.5	1.3	1.2	1.3	1.6	1.8	32%
Share of electricity output from fossil fuels	24%	24%	25%	20%	28%	36%	34%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	213	209	163	133	181	216	220	4%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	119	118	117	132	171	188	88%
Population index	100	109	118	126	134	141	142	42%
GDP PPP per population index	100	112	110	123	145	172	174	74%
Energy intensity index - TPES / GDP PPP	100	93	82	72	66	65	67	-33%
Carbon intensity index - CO ₂ / TPES	100	104	111	105	102	108	113	13%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	17.0	44.5	24.4	-	85.9	88%
Electricity and heat generation	6.3	3.6	7.0	-	16.9	119%
Other energy industry own use	0.0	2.2	8.7	-	11.0	140%
Manufacturing industries and construction	10.4	1.5	2.8	-	14.7	22%
Transport	-	30.2	1.2	-	31.5	93%
<i>of which: road</i>	-	30.2	1.2	-	31.4	99%
Other	0.3	6.9	4.6	-	11.8	131%
<i>of which: residential</i>	0.3	1.1	2.3	-	3.7	27%
<i>of which: services</i>	-	0.2	0.8	-	1.0	25%
<i>Memo: international marine bunkers</i>	-	1.1	-	-	1.1	216%
<i>Memo: international aviation bunkers</i>	-	4.0	-	-	4.0	157%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	30.2	15.8	16.8	16.8
Manufacturing industries - coal	10.4	5.9	5.8	22.6
Other energy industry own use - gas	8.7	2.5	4.9	27.5
Non-specified other - oil	5.9	2.2	3.3	30.7
Main activity prod. elec. and heat - coal	5.4	2.7	3.0	33.8
Main activity prod. elec. and heat - gas	4.9	2.9	2.7	36.5
Manufacturing industries - gas	2.8	1.9	1.6	38.0
Residential - gas	2.3	0.2	1.3	39.4
Non-specified other - gas	2.3	0.0	1.3	40.6
<i>Memo: total CO₂ from fuel combustion</i>	<i>85.9</i>	<i>45.8</i>	<i>47.9</i>	<i>47.9</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Republic of the Congo

Figure 1. CO₂ emissions by fuel

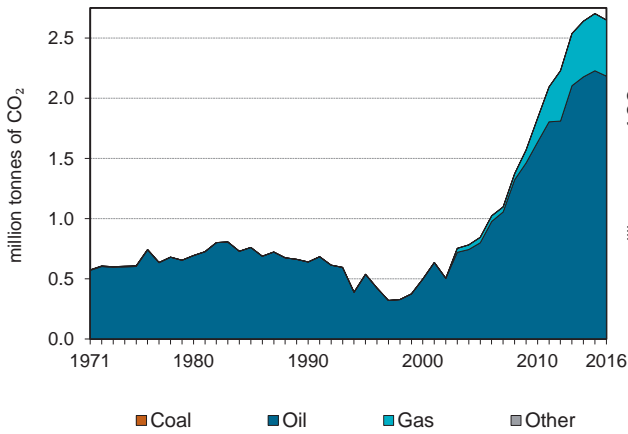


Figure 2. CO₂ emissions by sector

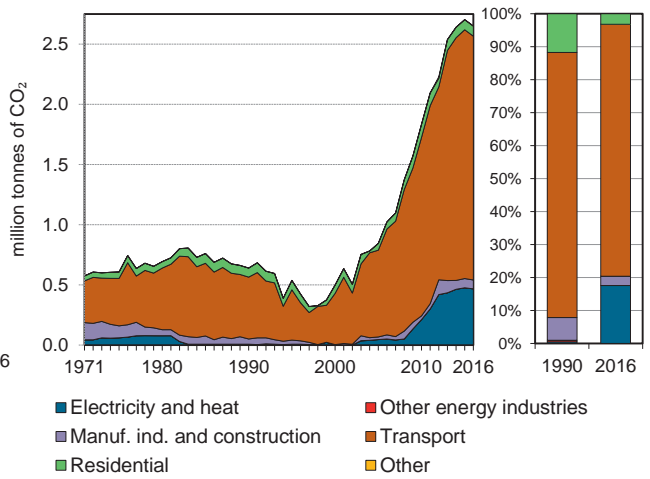


Figure 3. Electricity generation by fuel

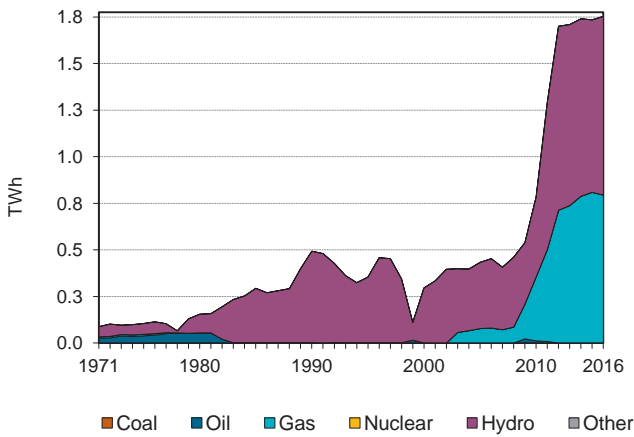


Figure 4. CO₂ from electricity generation: driving factors¹

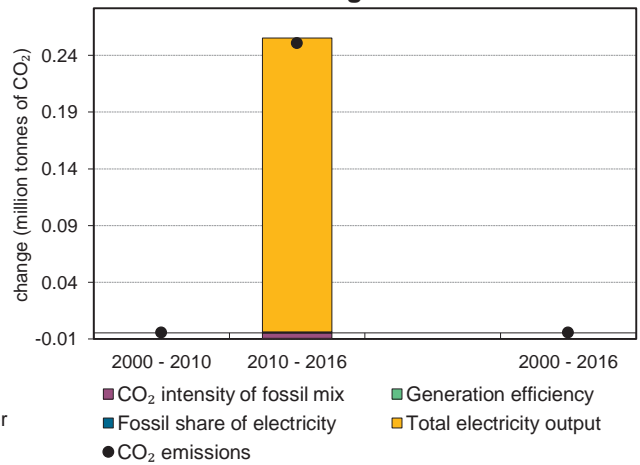


Figure 5. Changes in selected indicators

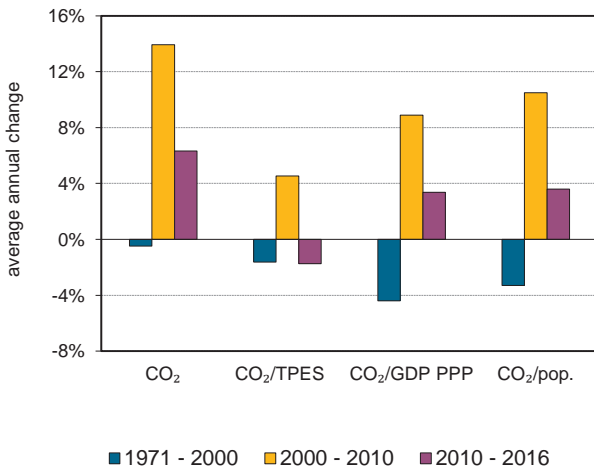
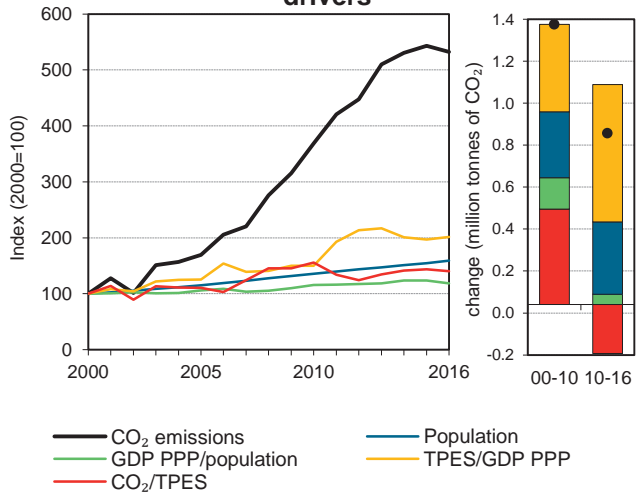


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Republic of the Congo

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	0.6	0.5	0.5	0.8	1.8	2.7	2.6	315%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	33	34	30	46	70	112	113	242%
GDP (billion 2010 USD)	6.6	6.8	7.6	9.3	12.0	14.6	14.3	117%
GDP PPP (billion 2010 USD)	12.3	12.6	14.2	17.3	22.3	27.1	26.6	117%
Population (millions)	2.4	2.8	3.2	3.7	4.4	5.0	5.1	110%
CO ₂ / TPES (tCO ₂ per TJ)	19.4	15.9	16.7	18.5	26.1	24.1	23.5	21%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.1	0.1	0.1	0.1	0.2	0.2	0.2	93%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.05	0.0	0.0	0.0	0.1	0.1	0.1	92%
CO ₂ / population (tCO ₂ per capita)	0.3	0.2	0.2	0.2	0.4	0.5	0.5	97%
Share of electricity output from fossil fuels	1%	1%	0%	18%	45%	47%	45%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	7	9	-	104	269	274	266	3988%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	84	78	132	287	423	415	315%
Population index	100	115	132	152	180	205	210	110%
GDP PPP per population index	100	89	87	92	101	108	103	3%
Energy intensity index - TPES / GDP PPP	100	100	78	98	117	154	158	58%
Carbon intensity index - CO ₂ / TPES	100	82	86	96	135	124	121	21%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	2.2	0.5	-	2.6	315%
Electricity and heat generation	-	-	0.5	-	0.5	+
Other energy industry own use	-	-	-	-	-	-100%
Manufacturing industries and construction	-	0.1	-	-	0.1	69%
Transport	-	2.0	-	-	2.0	294%
<i>of which: road</i>	-	1.6	-	-	1.6	234%
Other	-	0.1	-	-	0.1	12%
<i>of which: residential</i>	-	0.1	-	-	0.1	12%
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.1	-	-	0.1	71%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	1.6	0.5	8.4	8.4
Unallocated autoproducers - gas	0.5	-	2.4	10.8
Other transport - oil	0.4	0.0	2.0	12.7
Residential - oil	0.1	0.1	0.4	13.2
Manufacturing industries - oil	0.1	0.0	0.4	13.5
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	2.6	0.6	13.5	13.5

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Costa Rica

Figure 1. CO₂ emissions by fuel

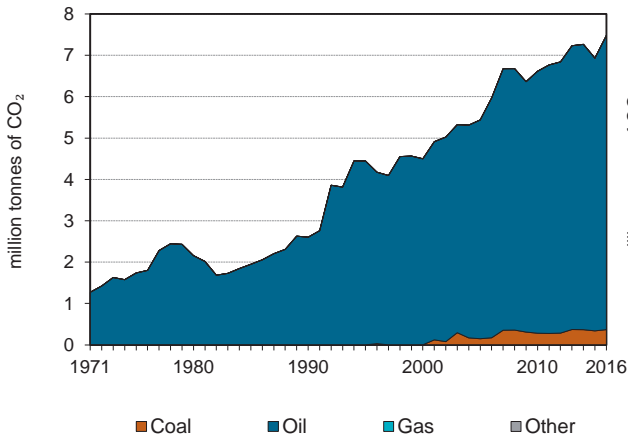


Figure 2. CO₂ emissions by sector

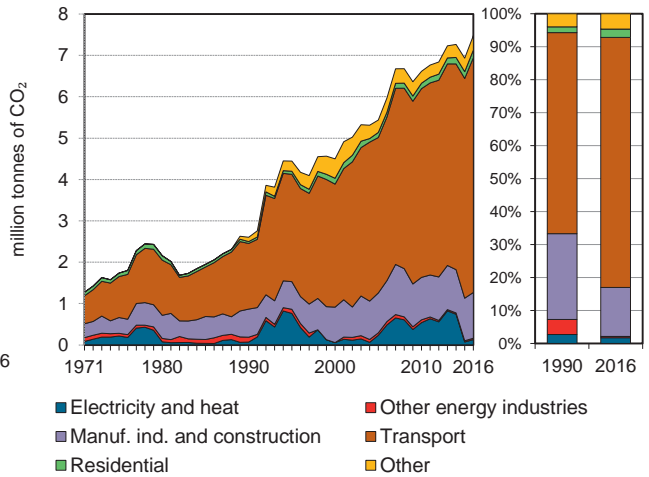


Figure 3. Electricity generation by fuel

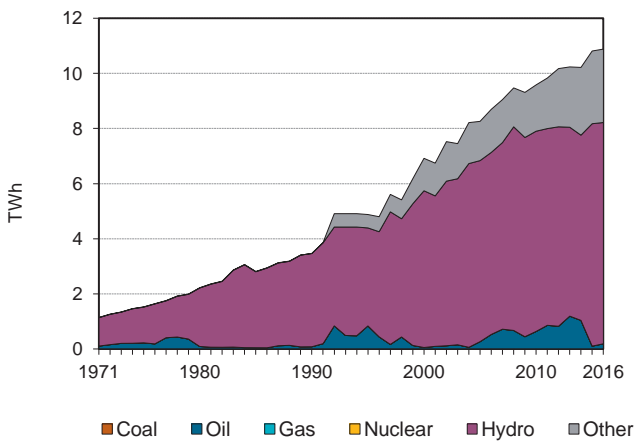


Figure 4. CO₂ from electricity generation: driving factors¹

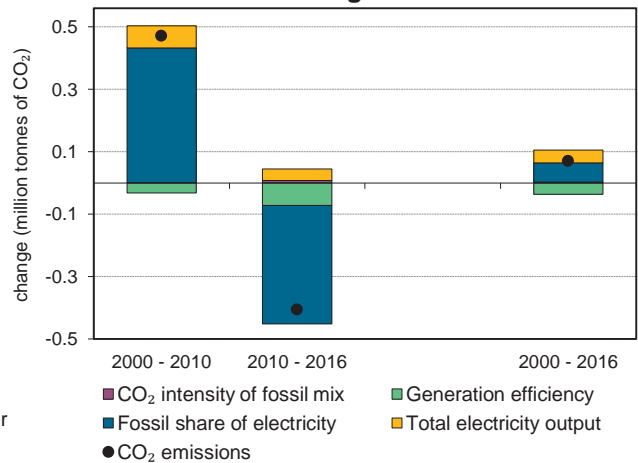


Figure 5. Changes in selected indicators

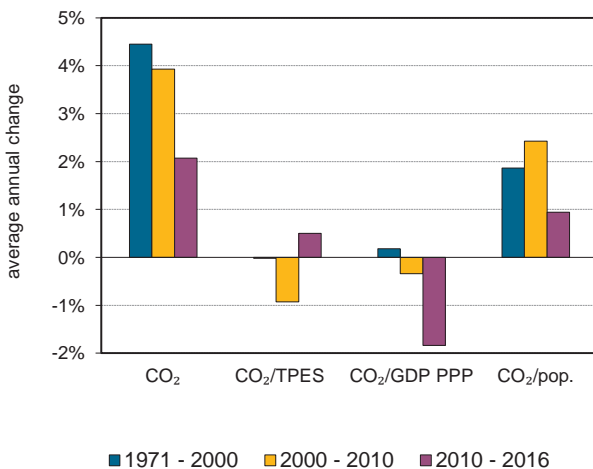
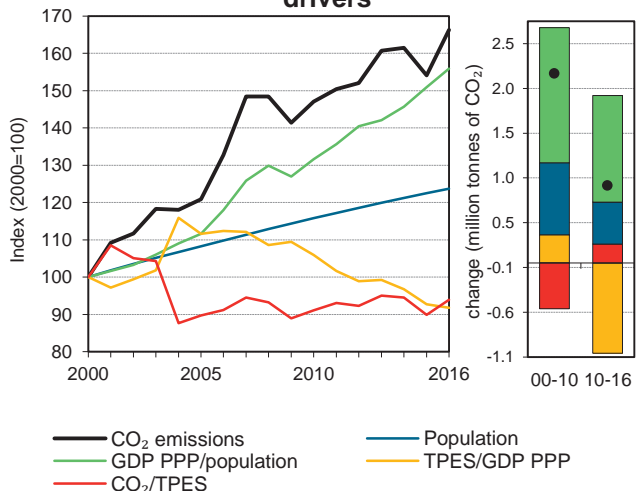


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Costa Rica

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	2.6	4.4	4.5	5.4	6.6	6.9	7.5	187%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	70	99	120	162	194	206	213	203%
GDP (billion 2010 USD)	15.2	19.8	24.5	29.5	37.3	45.2	47.2	210%
GDP PPP (billion 2010 USD)	23.6	30.8	38.0	45.9	57.9	70.3	73.3	210%
Population (millions)	3.1	3.5	3.9	4.2	4.5	4.8	4.9	57%
CO ₂ / TPES (tCO ₂ per TJ)	37.1	45.0	37.4	33.5	34.1	33.6	35.1	-5%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.17	0.2	0.2	0.2	0.2	0.2	0.2	-7%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.11	0.1	0.1	0.1	0.1	0.1	0.1	-7%
CO ₂ / population (tCO ₂ per capita)	0.8	1.3	1.1	1.3	1.5	1.4	1.5	83%
Share of electricity output from fossil fuels	3%	17%	1%	3%	7%	1%	2%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	20	156	8	28	56	7	12	-40%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	171	173	209	254	266	287	187%
Population index	100	113	127	137	147	155	157	57%
GDP PPP per population index	100	115	127	142	167	192	198	98%
Energy intensity index - TPES / GDP PPP	100	108	107	119	113	99	98	-2%
Carbon intensity index - CO ₂ / TPES	100	121	101	90	92	91	95	-5%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.4	7.1	-	-	7.5	187%
Electricity and heat generation	-	0.1	-	-	0.1	87%
Other energy industry own use	-	0.0	-	-	0.0	-74%
Manufacturing industries and construction	0.4	0.7	-	-	1.1	63%
Transport	-	5.7	-	-	5.7	258%
<i>of which: road</i>	-	5.7	-	-	5.7	845%
Other	-	0.5	-	-	0.5	259%
<i>of which: residential</i>	-	0.2	-	-	0.2	311%
<i>of which: services</i>	-	0.1	-	-	0.1	38%
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-100%
<i>Memo: international aviation bunkers</i>	-	0.6	-	-	0.6	+

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	5.7	0.6	42.5	42.5
Manufacturing industries - oil	0.7	0.7	5.5	48.0
Manufacturing industries - coal	0.4	-	2.8	50.8
Non-specified other - oil	0.3	0.1	2.6	53.4
Residential - oil	0.2	0.0	1.4	54.8
Main activity prod. elec. and heat - oil	0.1	0.0	1.0	55.8
Other energy industry own use - oil	0.0	0.1	0.2	56.0
Other transport - oil	0.0	1.0	0.1	56.1
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	7.5	2.6	56.1	56.1

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Côte d'Ivoire

Figure 1. CO₂ emissions by fuel

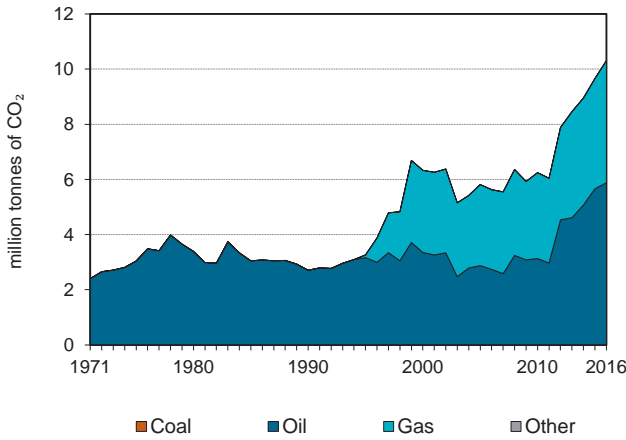


Figure 2. CO₂ emissions by sector

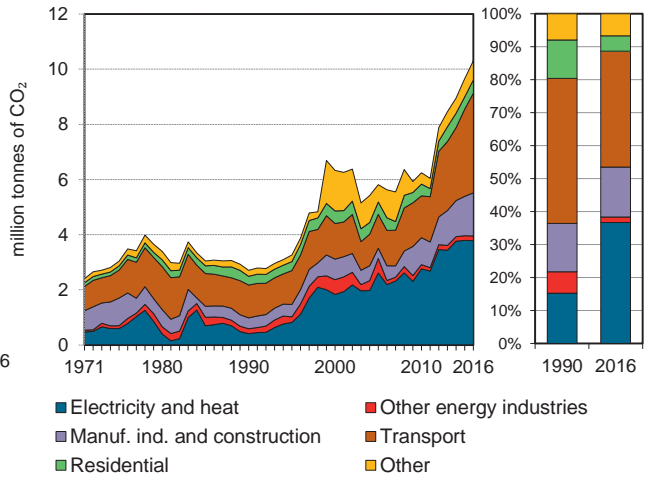


Figure 3. Electricity generation by fuel

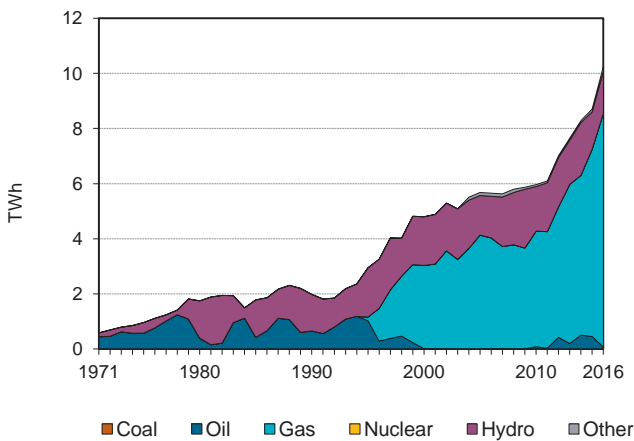


Figure 4. CO₂ from electricity generation: driving factors¹

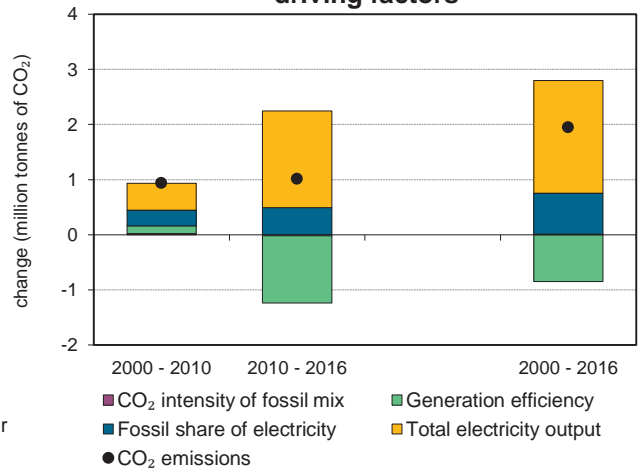


Figure 5. Changes in selected indicators

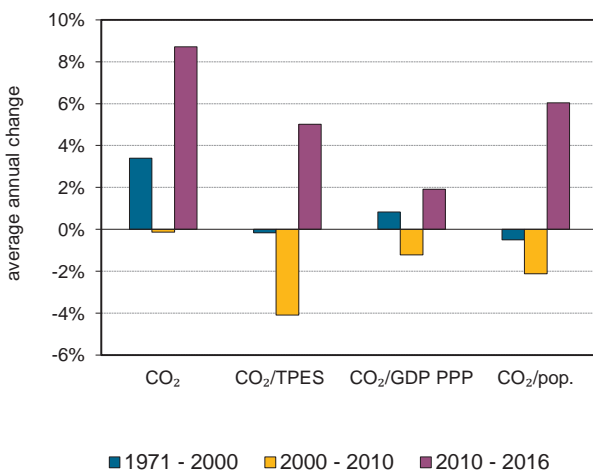
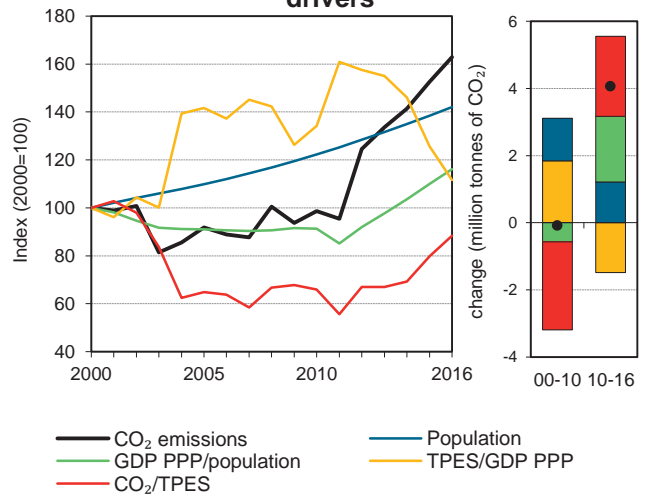


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Côte d'Ivoire

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	2.7	3.3	6.3	5.8	6.2	9.7	10.3	281%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	182	216	284	403	426	544	524	188%
GDP (billion 2010 USD)	17.8	19.1	22.3	22.3	24.9	34.1	37.0	109%
GDP PPP (billion 2010 USD)	38.4	41.3	48.2	48.2	53.8	73.4	79.5	107%
Population (millions)	12.3	14.5	16.7	18.3	20.4	23.1	23.7	93%
CO ₂ / TPES (tCO ₂ per TJ)	14.9	15.1	22.3	14.4	14.7	17.8	19.7	32%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.15	0.2	0.3	0.3	0.3	0.3	0.3	83%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.07	0.1	0.1	0.1	0.1	0.1	0.1	86%
CO ₂ / population (tCO ₂ per capita)	0.2	0.2	0.4	0.3	0.3	0.4	0.4	97%
Share of electricity output from fossil fuels	33%	40%	63%	73%	72%	83%	83%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	208	278	381	460	463	435	369	78%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	121	234	215	231	357	381	281%
Population index	100	119	136	149	166	188	193	93%
GDP PPP per population index	100	91	92	84	84	102	107	7%
Energy intensity index - TPES / GDP PPP	100	110	124	176	167	156	139	39%
Carbon intensity index - CO ₂ / TPES	100	102	150	97	99	119	132	32%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	5.9	4.4	-	10.3	281%
Electricity and heat generation	-	0.1	3.7	-	3.8	819%
Other energy industry own use	-	0.2	-	-	0.2	-4%
Manufacturing industries and construction	-	0.8	0.7	-	1.6	295%
Transport	-	3.6	-	-	3.6	203%
<i>of which: road</i>	-	3.2	-	-	3.2	209%
Other	-	1.2	-	-	1.2	122%
<i>of which: residential</i>	-	0.5	-	-	0.5	52%
<i>of which: services</i>	-	0.3	-	-	0.3	335%
<i>Memo: international marine bunkers</i>	-	0.3	-	-	0.3	108%
<i>Memo: international aviation bunkers</i>	-	0.5	-	-	0.5	89%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - gas	3.7	-	12.5	12.5
Road - oil	3.2	1.0	10.8	23.3
Manufacturing industries - oil	0.8	0.4	2.8	26.1
Manufacturing industries - gas	0.7	-	2.4	28.5
Non-specified other - oil	0.7	0.2	2.3	30.9
Residential - oil	0.5	0.3	1.6	32.5
Other transport - oil	0.4	0.2	1.4	33.9
Other energy industry own use - oil	0.2	0.2	0.6	34.4
Main activity prod. elec. and heat - oil	0.1	0.4	0.3	34.7
<i>Memo: total CO₂ from fuel combustion</i>	<i>10.3</i>	<i>2.7</i>	<i>34.7</i>	<i>34.7</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Croatia

Figure 1. CO₂ emissions by fuel

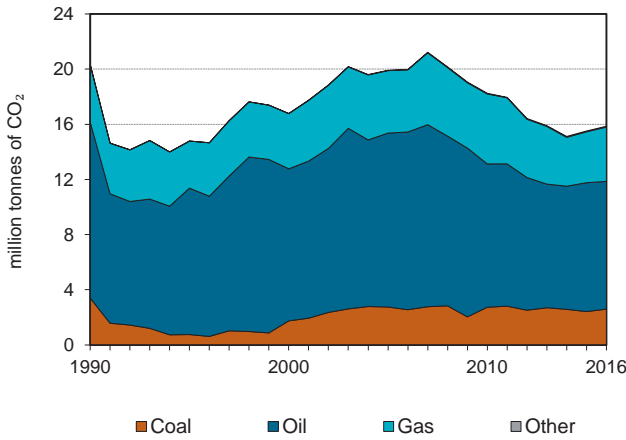


Figure 2. CO₂ emissions by sector

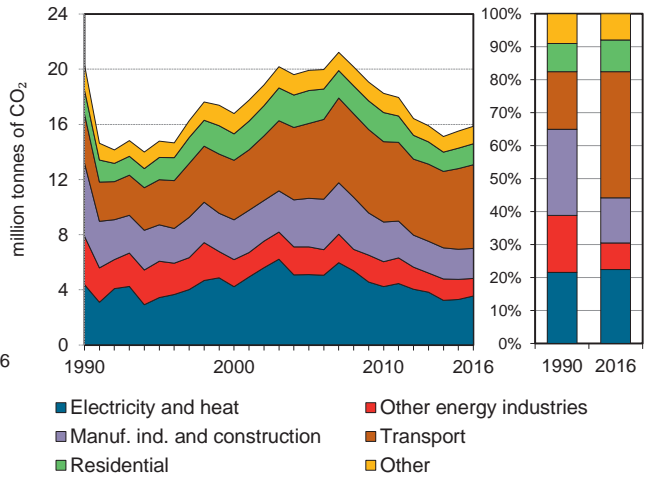


Figure 3. Electricity generation by fuel

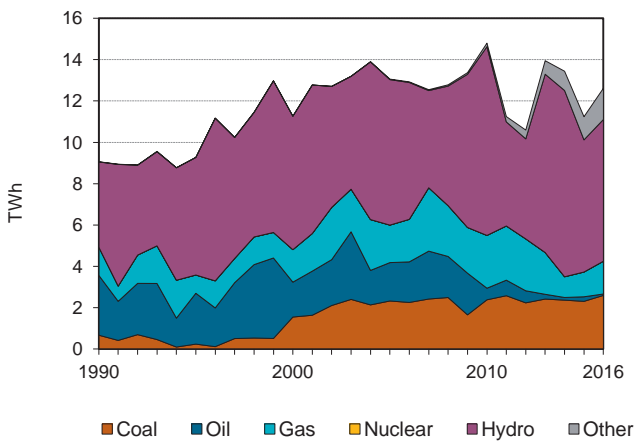


Figure 4. CO₂ from electricity generation: driving factors¹

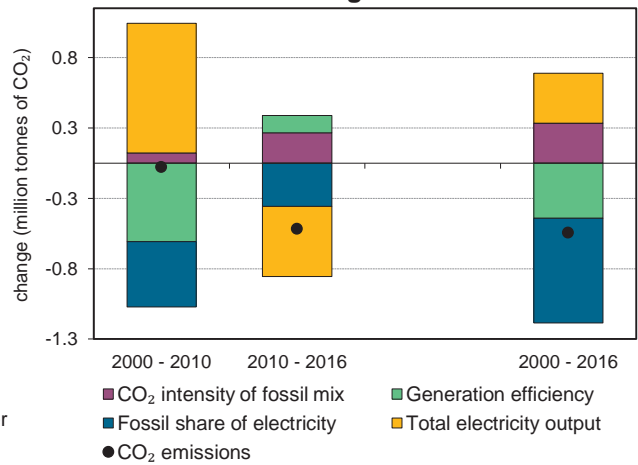


Figure 5. Changes in selected indicators

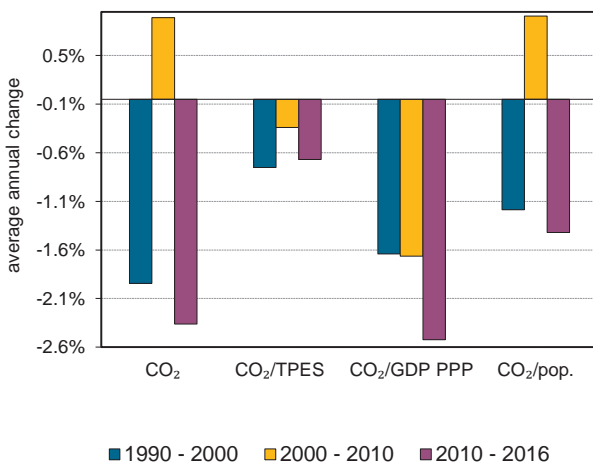
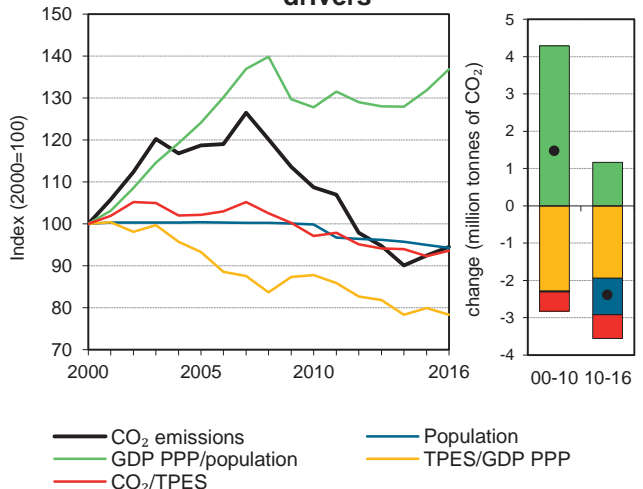


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Croatia

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	20.3	14.8	16.8	19.9	18.2	15.5	15.9	-22%
Share of World CO ₂ from fuel combustion	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	
TPES (PJ)	396	327	351	408	393	352	355	-11%
GDP (billion 2010 USD)	48.1	39.6	46.8	58.3	59.7	58.2	59.9	25%
GDP PPP (billion 2010 USD)	68.4	56.2	66.5	82.8	84.8	83.2	85.7	25%
Population (millions)	4.8	4.7	4.4	4.4	4.4	4.2	4.2	-13%
CO ₂ / TPES (tCO ₂ per TJ)	51.3	45.2	47.8	48.8	46.4	44.1	44.7	-13%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.42	0.4	0.4	0.3	0.3	0.3	0.3	-37%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.3	0.3	0.3	0.2	0.2	0.2	0.2	-38%
CO ₂ / population (tCO ₂ per capita)	4.3	3.2	3.8	4.5	4.1	3.7	3.8	-11%
Share of electricity output from fossil fuels	54%	39%	43%	46%	37%	33%	34%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	370	254	301	317	227	233	230	-38%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	73	83	98	90	76	78	-22%
Population index	100	98	93	93	92	88	87	-13%
GDP PPP per population index	100	84	105	130	134	138	144	44%
Energy intensity index - TPES / GDP PPP	100	100	91	85	80	73	71	-29%
Carbon intensity index - CO ₂ / TPES	100	88	93	95	91	86	87	-13%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	2.6	9.3	3.9	0.1	15.9	-22%
Electricity and heat generation	2.3	0.1	1.2	-	3.6	-19%
Other energy industry own use	-	0.9	0.4	-	1.3	-64%
Manufacturing industries and construction	0.3	1.0	0.8	0.1	2.2	-59%
Transport	-	6.1	0.0	-	6.1	70%
<i>of which: road</i>	-	5.8	0.0	-	5.8	84%
Other	0.0	1.2	1.6	-	2.8	-22%
<i>of which: residential</i>	0.0	0.4	1.1	-	1.5	-12%
<i>of which: services</i>	-	0.2	0.4	-	0.6	12%
<i>Memo: international marine bunkers</i>	-	0.0	-	-	0.0	-89%
<i>Memo: international aviation bunkers</i>	-	0.4	-	-	0.4	-25%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	5.8	3.2	24.8	24.8
Main activity prod. elec. and heat - coal	2.3	0.6	9.7	34.5
Residential - gas	1.1	0.4	4.6	39.2
Main activity prod. elec. and heat - gas	1.1	1.1	4.5	43.7
Manufacturing industries - oil	1.0	2.0	4.3	48.0
Other energy industry own use - oil	0.9	2.3	3.9	51.9
Manufacturing industries - gas	0.8	1.5	3.6	55.4
Non-specified other - oil	0.8	1.5	3.3	58.8
Non-specified other - gas	0.5	0.2	2.0	60.8
<i>Memo: total CO₂ from fuel combustion</i>	<i>15.9</i>	<i>20.3</i>	<i>67.3</i>	<i>67.3</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Cuba

Figure 1. CO₂ emissions by fuel

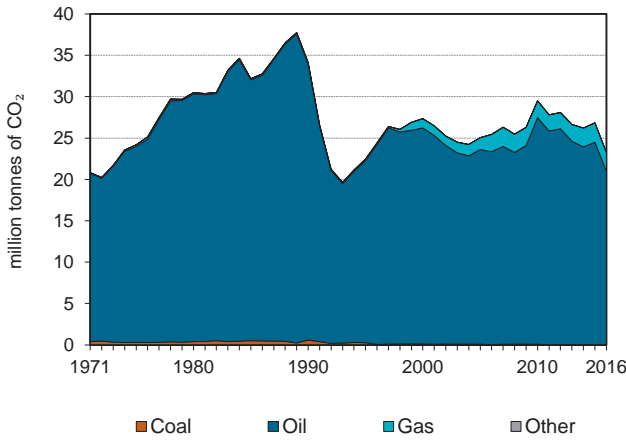


Figure 2. CO₂ emissions by sector

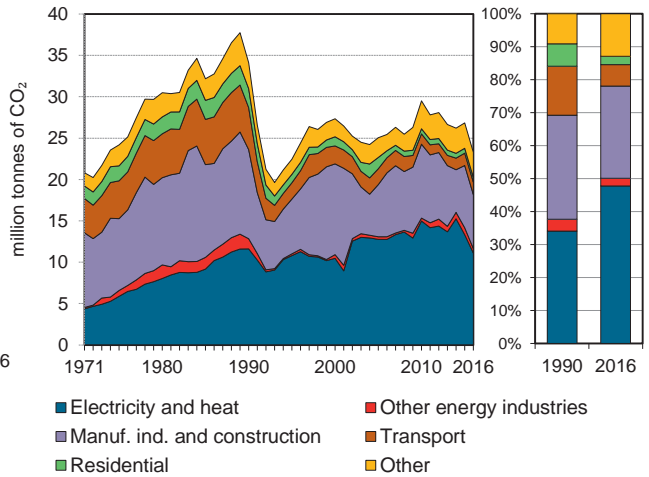


Figure 3. Electricity generation by fuel

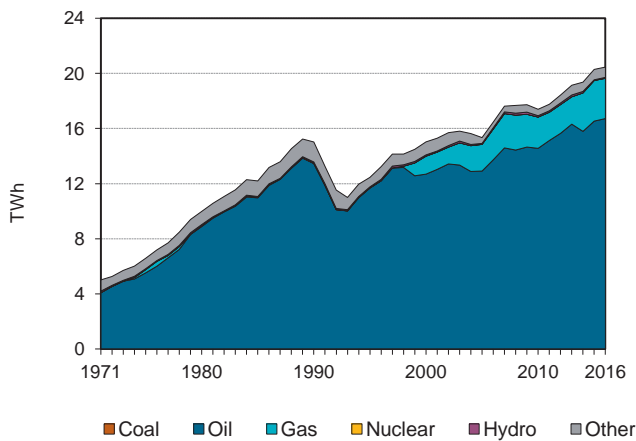


Figure 4. CO₂ from electricity generation: driving factors¹

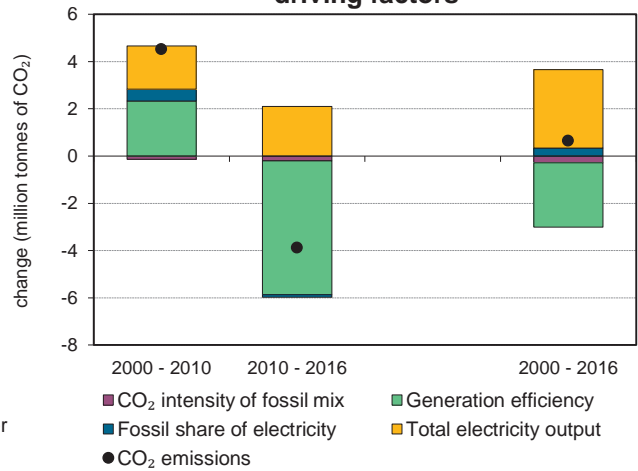


Figure 5. Changes in selected indicators

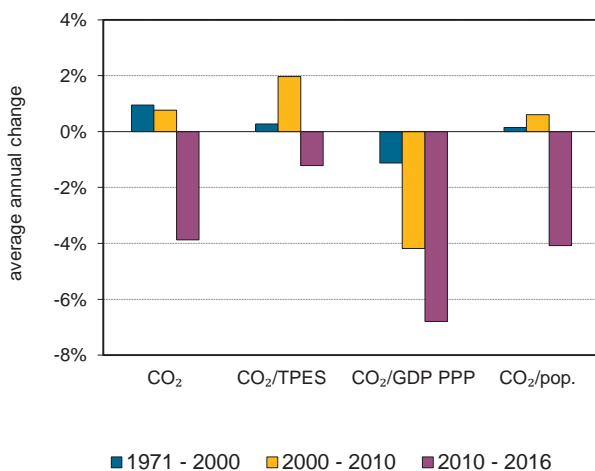
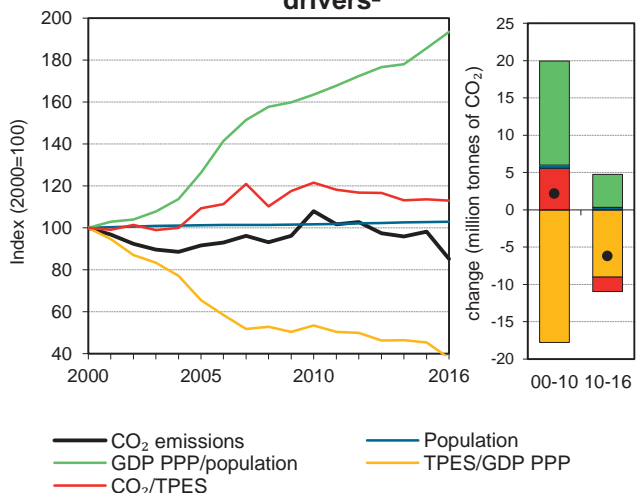


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Cuba

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	34.1	22.4	27.3	25.1	29.5	26.8	23.3	-32%
Share of World CO ₂ from fuel combustion	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	
TPES (PJ)	729	455	533	447	473	461	402	-45%
GDP (billion 2010 USD)	44.7	31.0	38.7	49.5	64.3	73.9	77.1	72%
GDP PPP (billion 2010 USD)	138.9	96.3	120.3	153.7	199.8	229.5	239.4	72%
Population (millions)	10.6	10.9	11.2	11.3	11.3	11.5	11.5	8%
CO ₂ / TPES (tCO ₂ per TJ)	46.8	49.4	51.3	56.1	62.3	58.2	57.9	24%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.76	0.7	0.7	0.5	0.5	0.4	0.3	-60%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.25	0.2	0.2	0.2	0.1	0.1	0.1	-61%
CO ₂ / population (tCO ₂ per capita)	3.2	2.1	2.5	2.2	2.6	2.3	2.0	-37%
Share of electricity output from fossil fuels	90%	94%	93%	97%	97%	96%	96%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	773	867	697	832	861	657	543	-30%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	66	80	73	86	79	68	-32%
Population index	100	103	105	107	107	108	108	8%
GDP PPP per population index	100	67	82	104	134	153	159	59%
Energy intensity index - TPES / GDP PPP	100	90	84	55	45	38	32	-68%
Carbon intensity index - CO ₂ / TPES	100	105	110	120	133	124	124	24%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.0	21.0	2.2	-	23.3	-32%
Electricity and heat generation	-	9.6	1.5	-	11.1	-4%
Other energy industry own use	-	0.5	-	-	0.5	-56%
Manufacturing industries and construction	0.0	5.9	0.6	-	6.5	-39%
Transport	-	1.5	-	-	1.5	-70%
<i>of which: road</i>	-	1.5	-	-	1.5	-67%
Other	-	3.5	0.1	-	3.6	-34%
<i>of which: residential</i>	-	0.5	0.1	-	0.6	-75%
<i>of which: services</i>	-	0.0	-	-	0.0	x
<i>Memo: international marine bunkers</i>	-	2.0	-	-	2.0	+
<i>Memo: international aviation bunkers</i>	-	0.3	-	-	0.3	-71%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - oil	9.3	10.7	21.2	21.2
Manufacturing industries - oil	5.9	10.2	13.4	34.7
Non-specified other - oil	3.0	3.1	6.9	41.5
Main activity prod. elec. and heat - gas	1.5	0.0	3.4	44.9
Road - oil	1.5	4.4	3.3	48.2
Manufacturing industries - gas	0.6	0.0	1.5	49.7
Other energy industry own use - oil	0.5	1.2	1.2	50.9
Residential - oil	0.5	2.2	1.1	52.0
Unallocated autoproducers - oil	0.4	0.9	0.8	52.8
<i>Memo: total CO₂ from fuel combustion</i>	23.3	34.1	53.2	53.2

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Curaçao ¹

Figure 1. CO₂ emissions by fuel

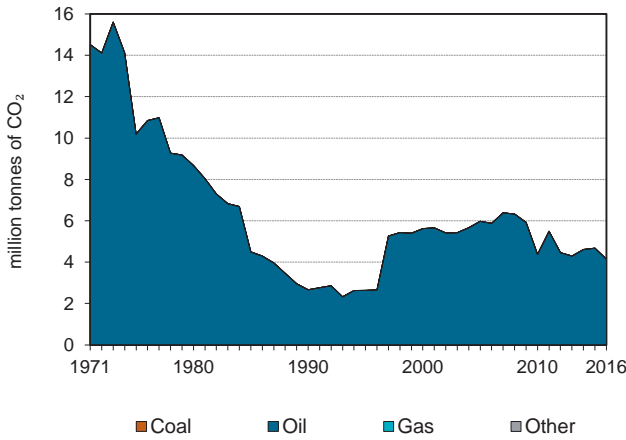


Figure 2. CO₂ emissions by sector

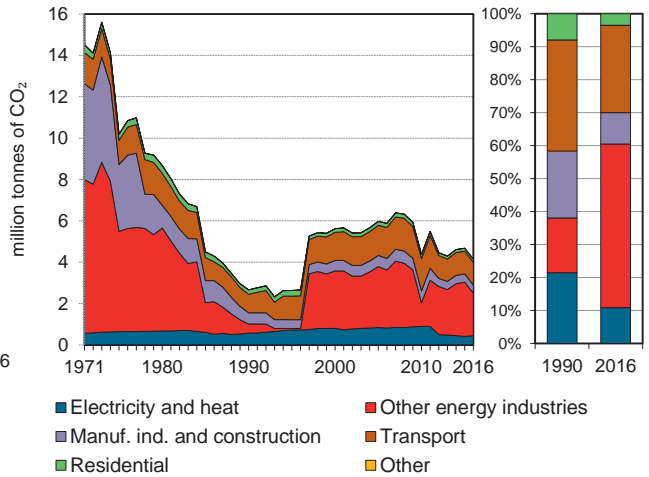


Figure 3. Electricity generation by fuel

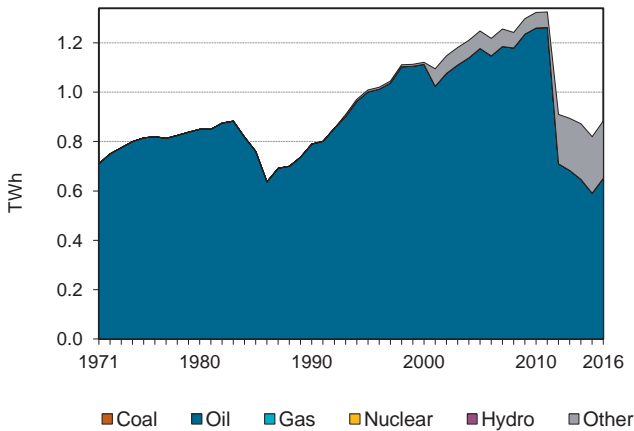


Figure 4. CO₂ from electricity generation: driving factors²

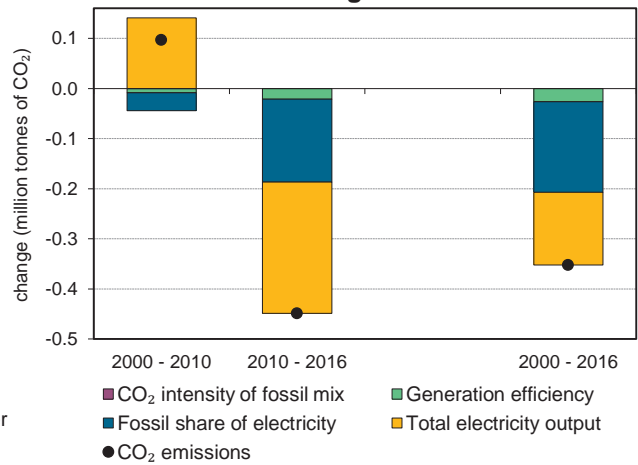


Figure 5. Changes in selected indicators

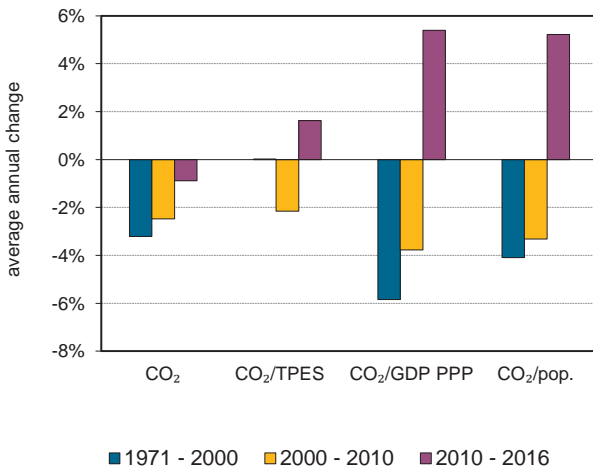
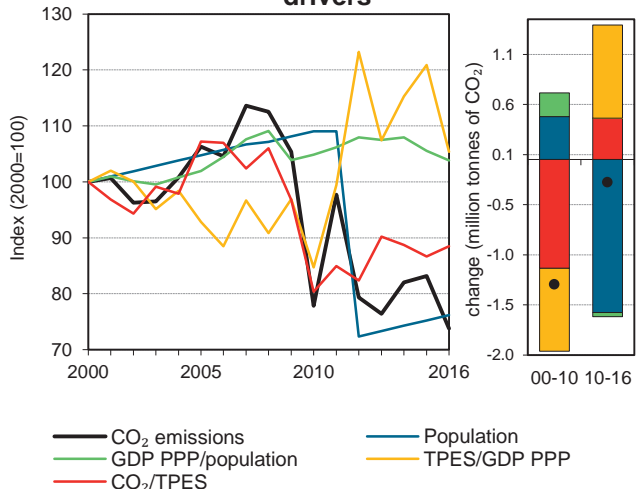


Figure 6. Total CO₂ emissions and drivers³



1. Please refer to the chapter Geographical Coverage in Part I.

2. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.

3. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Curaçao ¹

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	2.7	2.6	5.6	6.0	4.4	4.7	4.1	56%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	61	55	88	87	85	85	74	20%
GDP (billion 2010 USD)	1.7	1.9	2.3	2.5	2.7	1.9	1.9	8%
GDP PPP (billion 2010 USD)	1.5	1.7	2.1	2.2	2.4	1.7	1.7	8%
Population (millions)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	-15%
CO ₂ / TPES (tCO ₂ per TJ)	43.6	47.9	63.7	68.3	51.2	55.2	56.4	29%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.55	1.4	2.4	2.4	1.6	2.5	2.2	44%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	1.73	1.5	2.7	2.7	1.8	2.8	2.5	44%
CO ₂ / population (tCO ₂ per capita)	14.1	13.2	26.8	27.2	19.1	29.6	25.9	84%
Share of electricity output from fossil fuels	100%	99%	99%	94%	95%	72%	74%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	725	715	716	676	680	501	510	-30%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ²								
CO ₂ emissions index	100	99	211	224	164	175	156	56%
Population index	100	105	111	116	121	84	85	-15%
GDP PPP per population index	100	106	123	125	129	130	128	28%
Energy intensity index - TPES / GDP PPP	100	80	106	98	90	128	112	12%
Carbon intensity index - CO ₂ / TPES	100	110	146	157	117	127	129	29%

1. Please refer to the chapter Geographical Coverage in Part I. 2. Please see Part I for methodological notes.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ³	Total	%change 90-16
CO₂ fuel combustion	-	4.1	-	-	4.1	56%
Electricity and heat generation	-	0.5	-	-	0.5	-21%
Other energy industry own use	-	2.1	-	-	2.1	365%
Manufacturing industries and construction	-	0.4	-	-	0.4	-26%
Transport	-	1.1	-	-	1.1	22%
<i>of which: road</i>	-	1.1	-	-	1.1	22%
Other	-	0.1	-	-	0.1	-31%
<i>of which: residential</i>	-	0.1	-	-	0.1	-31%
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	5.0	-	-	5.0	-4%
<i>Memo: international aviation bunkers</i>	-	0.2	-	-	0.2	62%

3. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ⁴ (%)	Cumulative total (%)
Other energy industry own use - oil	2.1	0.4	..	..
Road - oil	1.1	0.9	..	..
Manufacturing industries - oil	0.4	0.5	..	..
Unallocated autoproducers - oil	0.3	0.3	..	..
Residential - oil	0.1	0.2	..	..
Main activity prod. elec. and heat - oil	0.1	0.3	..	..
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	4.1	2.7	..	..

4. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Cyprus¹

Figure 1. CO₂ emissions by fuel

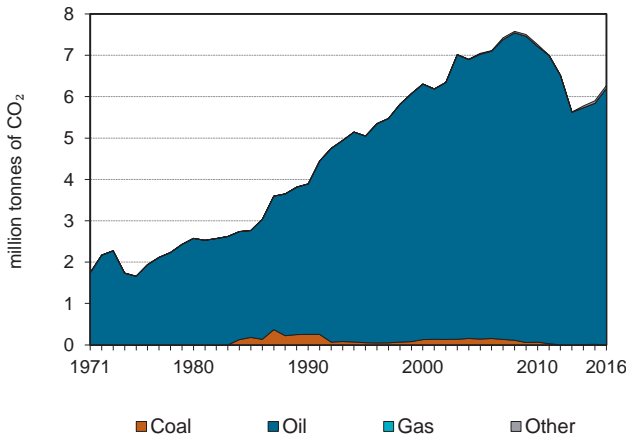


Figure 2. CO₂ emissions by sector

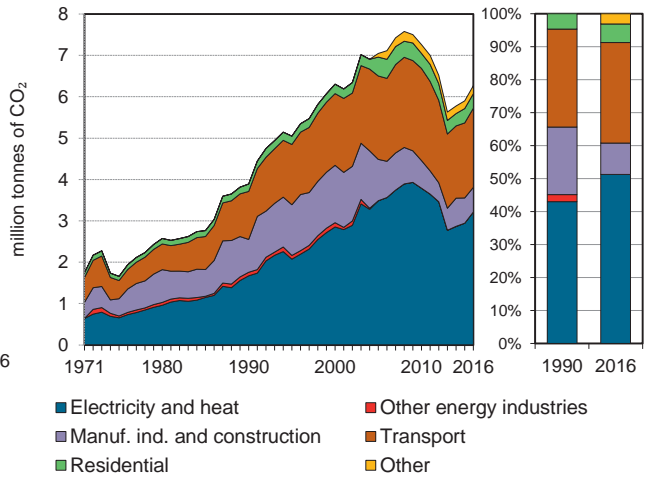


Figure 3. Electricity generation by fuel

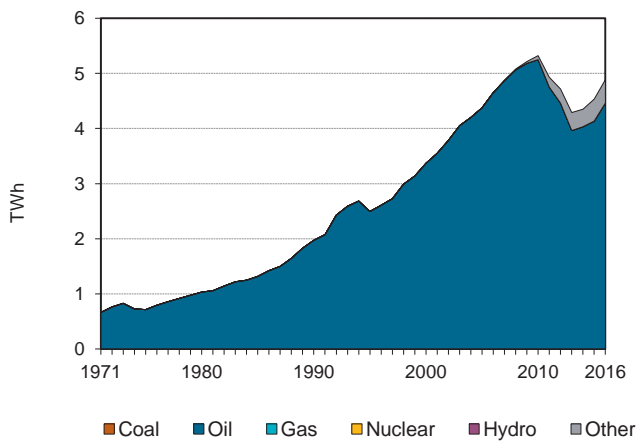


Figure 4. CO₂ from electricity generation: driving factors²

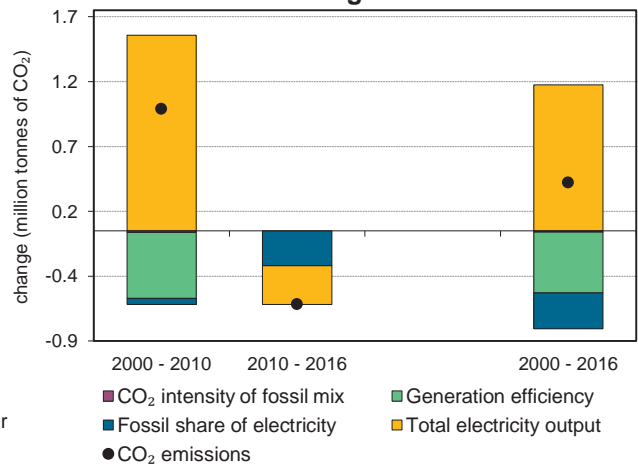


Figure 5. Changes in selected indicators

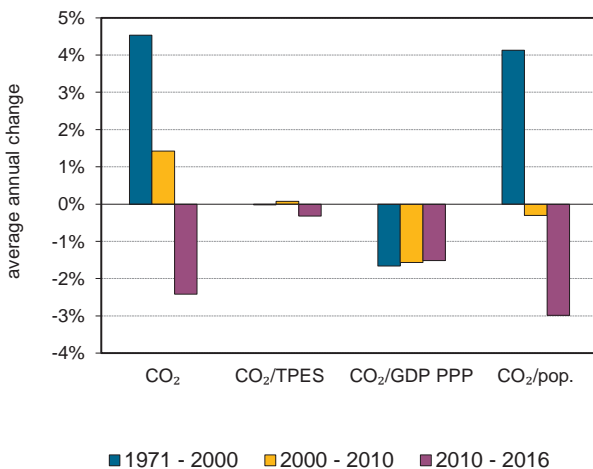
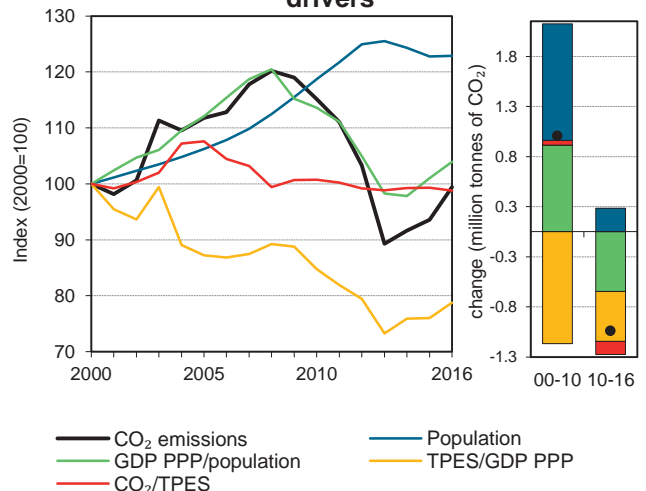


Figure 6. Total CO₂ emissions and drivers³



1. Please refer to the chapter Geographical Coverage in Part I.

2. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.

3. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Cyprus ¹

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	3.9	5.0	6.3	7.0	7.3	5.9	6.3	61%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	57	71	89	93	102	84	90	58%
GDP (billion 2010 USD)	12.3	15.6	19.0	22.6	25.6	23.4	24.0	96%
GDP PPP (billion 2010 USD)	13.2	16.9	20.5	24.4	27.6	25.4	26.1	97%
Population (millions)	0.6	0.6	0.7	0.7	0.8	0.8	0.8	48%
CO ₂ / TPES (tCO ₂ per TJ)	68.1	71.1	70.5	75.9	71.0	70.0	69.6	2%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.32	0.3	0.3	0.3	0.3	0.3	0.3	-18%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.29	0.3	0.3	0.3	0.3	0.2	0.2	-18%
CO ₂ / population (tCO ₂ per capita)	6.8	7.8	9.1	9.6	8.9	7.0	7.4	9%
Share of electricity output from fossil fuels	100%	100%	100%	100%	99%	91%	91%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	847	831	846	797	712	649	658	-22%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ²								
CO ₂ emissions index	100	130	162	181	187	152	161	61%
Population index	100	113	120	128	143	148	148	48%
GDP PPP per population index	100	113	128	144	146	130	133	33%
Energy intensity index - TPES / GDP PPP	100	97	101	88	86	77	80	-20%
Carbon intensity index - CO ₂ / TPES	100	104	104	111	104	103	102	2%

1. Please refer to the chapter Geographical Coverage in Part I. 2. Please see Part I for methodological notes.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ³	Total	%change 90-16
CO₂ fuel combustion	-	6.2	-	0.1	6.3	61%
Electricity and heat generation	-	3.2	-	-	3.2	92%
Other energy industry own use	-	-	-	-	-	-100%
Manufacturing industries and construction	-	0.5	-	0.1	0.6	-25%
Transport	-	1.9	-	-	1.9	65%
<i>of which: road</i>	-	1.9	-	-	1.9	65%
Other	-	0.5	-	-	0.5	204%
<i>of which: residential</i>	-	0.4	-	-	0.4	95%
<i>of which: services</i>	-	0.1	-	-	0.1	x
<i>Memo: international marine bunkers</i>	-	0.9	-	-	0.9	396%
<i>Memo: international aviation bunkers</i>	-	0.8	-	-	0.8	11%

3. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ⁴ (%)	Cumulative total (%)
Main activity prod. elec. and heat - oil	3.2	1.7	37.5	37.5
Road - oil	1.9	1.2	22.3	59.8
Manufacturing industries - oil	0.5	0.5	6.2	66.0
Residential - oil	0.4	0.2	4.1	70.1
Non-specified other - oil	0.2	-	2.3	72.4
Manufacturing industries -other	0.1	-	0.8	73.1
Unallocated autoproducers - oil	0.0	-	0.1	73.2
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	6.3	3.9	73.2	73.2

4. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Czech Republic

Figure 1. CO₂ emissions by fuel

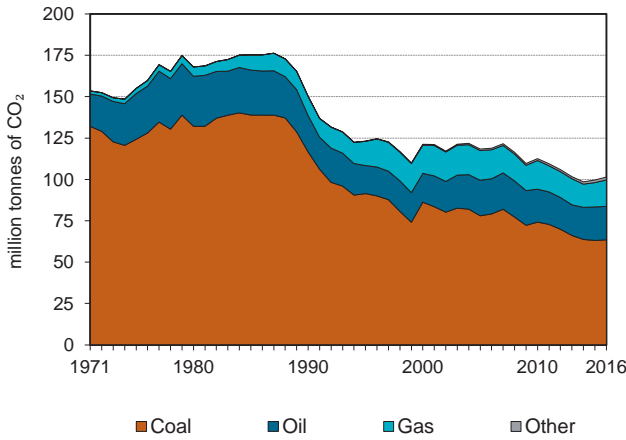


Figure 2. CO₂ emissions by sector

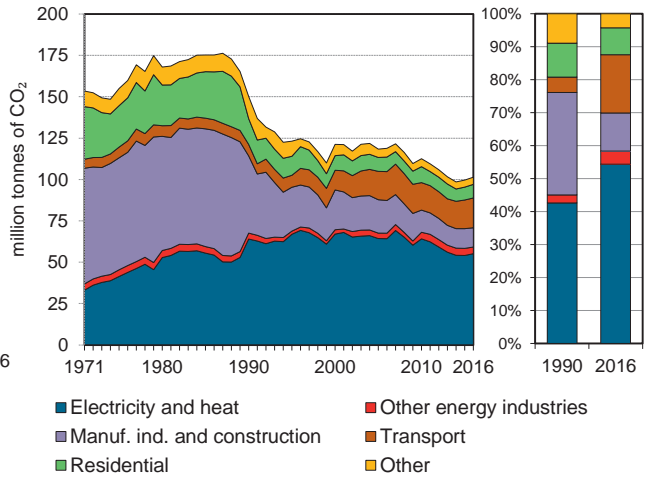


Figure 3. Electricity generation by fuel

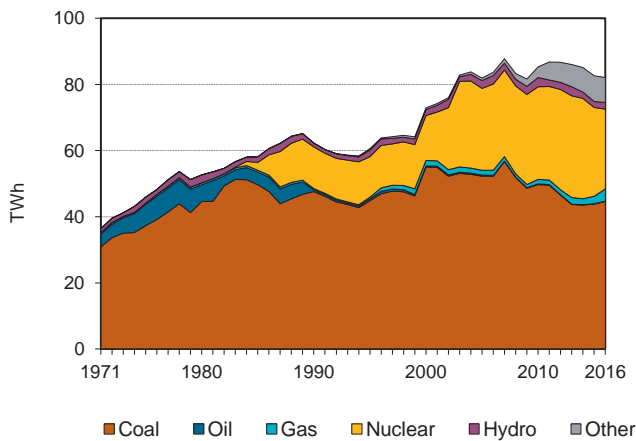


Figure 4. CO₂ from electricity generation: driving factors¹

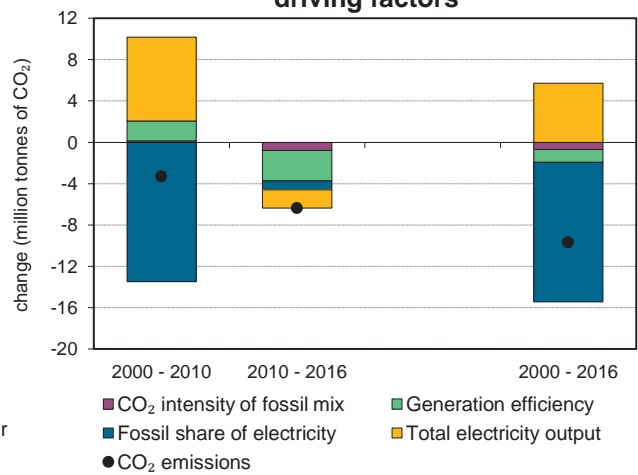


Figure 5. Changes in selected indicators

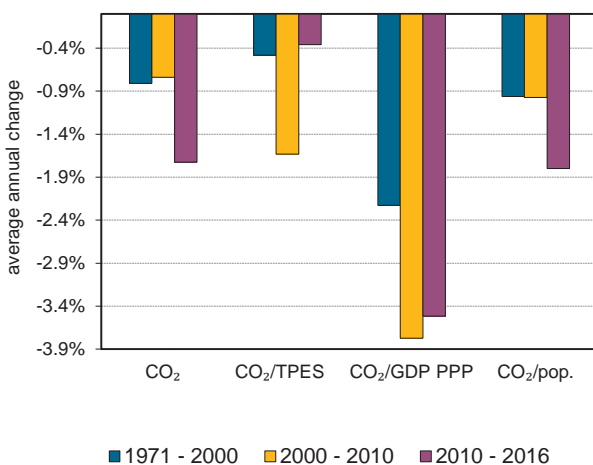
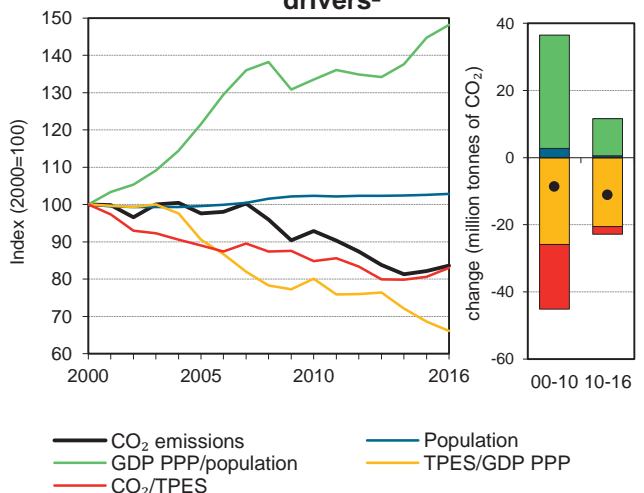


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Czech Republic

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	150.2	123.2	121.2	118.4	112.6	99.6	101.4	-32%
Share of World CO ₂ from fuel combustion	0.7%	0.6%	0.5%	0.4%	0.4%	0.3%	0.3%	
TPES (PJ)	2085	1 748	1 727	1 895	1 890	1 760	1 740	-17%
GDP (billion 2010 USD)	144.6	139.0	151.8	183.9	207.5	225.5	231.3	60%
GDP PPP (billion 2010 USD)	202.3	194.6	212.5	257.4	290.4	315.6	323.8	60%
Population (millions)	10.4	10.3	10.3	10.2	10.5	10.5	10.6	2%
CO ₂ / TPES (tCO ₂ per TJ)	72	70.5	70.2	62.5	59.6	56.6	58.3	-19%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.04	0.9	0.8	0.6	0.5	0.4	0.4	-58%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.74	0.6	0.6	0.5	0.4	0.3	0.3	-58%
CO ₂ / population (tCO ₂ per capita)	14.5	11.9	11.8	11.6	10.7	9.5	9.6	-34%
Share of electricity output from fossil fuels	78%	76%	78%	66%	60%	56%	59%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	759	809	730	624	584	520	530	-30%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	82	81	79	75	66	68	-32%
Population index	100	100	99	99	101	102	102	2%
GDP PPP per population index	100	96	106	129	141	153	157	57%
Energy intensity index - TPES / GDP PPP	100	87	79	71	63	54	52	-48%
Carbon intensity index - CO ₂ / TPES	100	98	97	87	83	79	81	-19%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16	
CO₂ fuel combustion	63.5		20.2	16.0	1.7	101.4	-32%
Electricity and heat generation	51.4		0.1	3.4	0.3	55.2	-14%
Other energy industry own use	3.3		0.5	0.2	-	4.0	12%
Manufacturing industries and construction	5.2		0.4	4.7	1.3	11.7	-75%
Transport	0.0		17.9	0.1	-	18.0	159%
<i>of which: road</i>	-		17.5	0.1	-	17.6	153%
Other	3.6		1.3	7.5	0.1	12.6	-57%
<i>of which: residential</i>	3.4		0.1	4.7	-	8.2	-47%
<i>of which: services</i>	0.1		0.1	2.6	0.1	3.0	-61%
<i>Memo: international marine bunkers</i>	-		-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-		0.9	-	-	0.9	43%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	47.3	51.6	35.1	35.1
Road - oil	17.5	6.9	13.0	48.1
Manufacturing industries - coal	5.2	31.8	3.8	51.9
Manufacturing industries - gas	4.7	5.7	3.5	55.5
Residential - gas	4.7	2.2	3.5	58.9
Unallocated autoproducers - coal	4.1	9.2	3.0	62.0
Residential - coal	3.4	13.2	2.5	64.5
Other energy industry - coal	3.3	3.2	2.5	67.0
Non-specified other - gas	2.9	2.1	2.1	69.1
<i>Memo: total CO₂ from fuel combustion</i>	<i>101.4</i>	<i>150.2</i>	<i>75.3</i>	<i>75.3</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Democratic People's Republic of Korea

Figure 1. CO₂ emissions by fuel

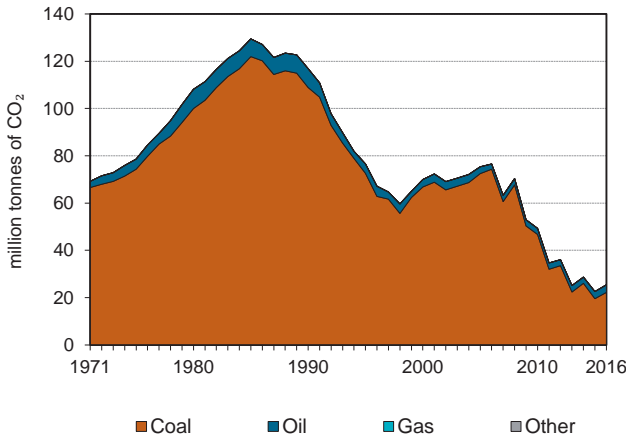


Figure 2. CO₂ emissions by sector

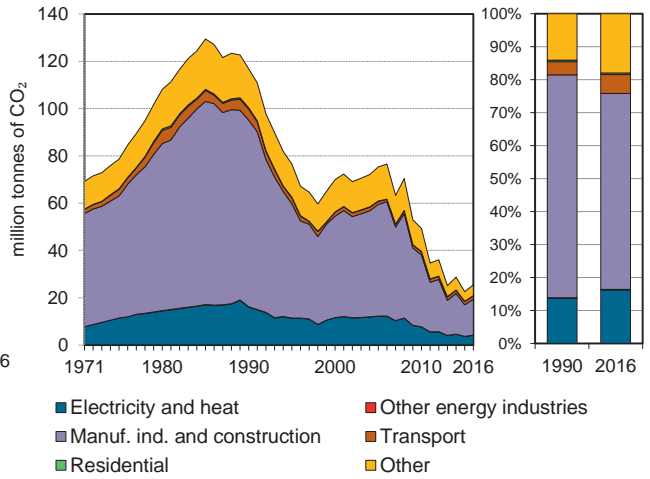


Figure 3. Electricity generation by fuel

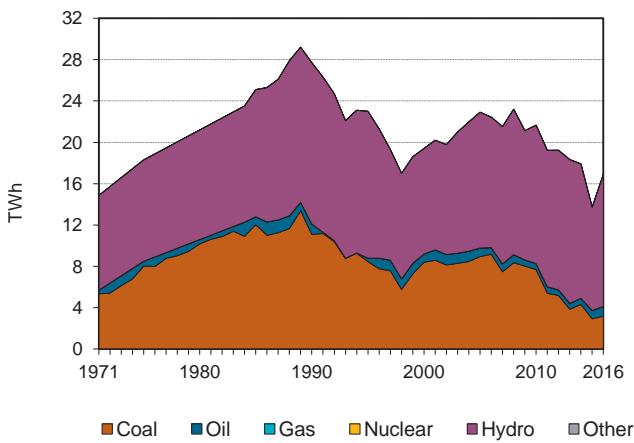


Figure 4. CO₂ from electricity generation: driving factors¹

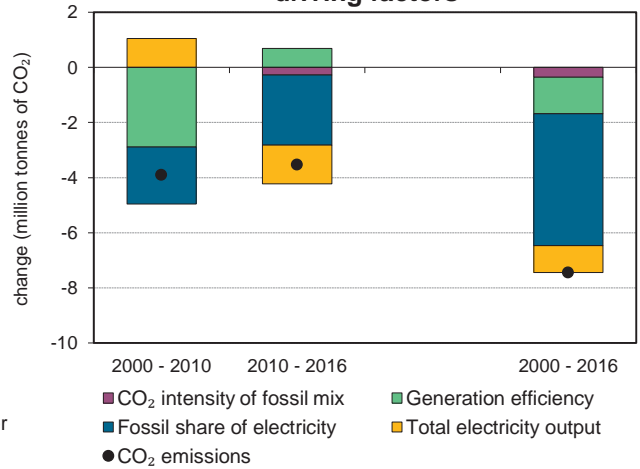


Figure 5. Changes in selected indicators

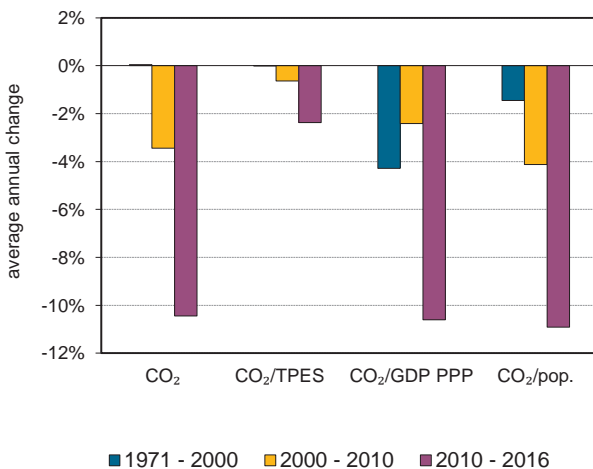
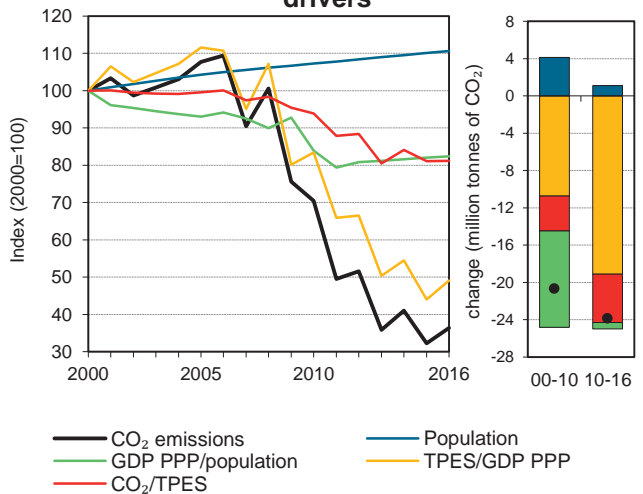


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Democratic People's Republic of Korea

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	116.9	76.5	70.0	75.3	49.3	22.5	25.4	-78%
Share of World CO ₂ from fuel combustion	0.6%	0.4%	0.3%	0.3%	0.2%	0.1%	0.1%	
TPES (PJ)	1391	920	826	893	620	328	369	-73%
GDP (billion 2010 USD)	42.7	33.5	29.8	28.9	26.8	26.9	27.1	-36%
GDP PPP (billion 2010 USD)	160.2	125.8	111.7	108.4	100.6	100.8	101.9	-36%
Population (millions)	20.3	21.9	22.9	23.9	24.6	25.2	25.4	25%
CO ₂ / TPES (tCO ₂ per TJ)	84	83.1	84.8	84.3	79.5	68.7	68.8	-18%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	2.74	2.3	2.4	2.6	1.8	0.8	0.9	-66%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.73	0.6	0.6	0.7	0.5	0.2	0.3	-66%
CO ₂ / population (tCO ₂ per capita)	5.8	3.5	3.1	3.2	2.0	0.9	1.0	-83%
Share of electricity output from fossil fuels	44%	38%	47%	43%	38%	27%	24%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	577	491	595	532	352	263	243	-58%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	65	60	64	42	19	22	-78%
Population index	100	108	113	118	121	124	125	25%
GDP PPP per population index	100	73	62	57	52	51	51	-49%
Energy intensity index - TPES / GDP PPP	100	84	85	95	71	37	42	-58%
Carbon intensity index - CO ₂ / TPES	100	99	101	100	95	82	82	-18%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	22.2	3.2	-	-	25.4	-78%
Electricity and heat generation	2.8	1.3	-	-	4.1	-74%
Other energy industry own use	-	0.0	-	-	0.0	-75%
Manufacturing industries and construction	14.8	0.3	-	-	15.1	-81%
Transport	-	1.4	-	-	1.4	-69%
<i>of which: road</i>	-	1.4	-	-	1.4	-69%
Other	4.6	0.1	-	-	4.7	-72%
<i>of which: residential</i>	-	0.1	-	-	0.1	-78%
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	-	-	-	-	-

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Manufacturing industries - coal	14.8	77.8	25.0	25.0
Non-specified other sectors - coal	4.6	16.5	7.7	32.6
Main activity prod. elec. and heat - coal	2.8	14.6	4.7	37.3
Road - oil	1.4	4.7	2.4	39.8
Main activity prod. elec. and heat - oil	1.3	1.3	2.2	42.0
Manufacturing industries - oil	0.3	1.2	0.5	42.5
Residential - oil	0.1	0.5	0.2	42.7
Other energy industry own use - oil	0.0	0.2	0.1	42.8
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	<i>25.4</i>	<i>116.9</i>	<i>42.8</i>	<i>42.8</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Democratic Republic of the Congo

Figure 1. CO₂ emissions by fuel

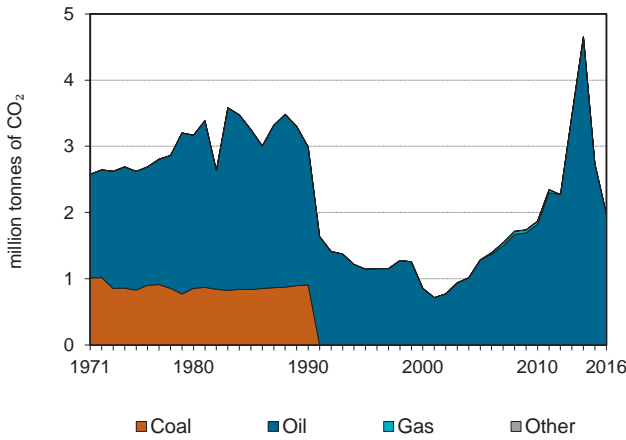


Figure 2. CO₂ emissions by sector

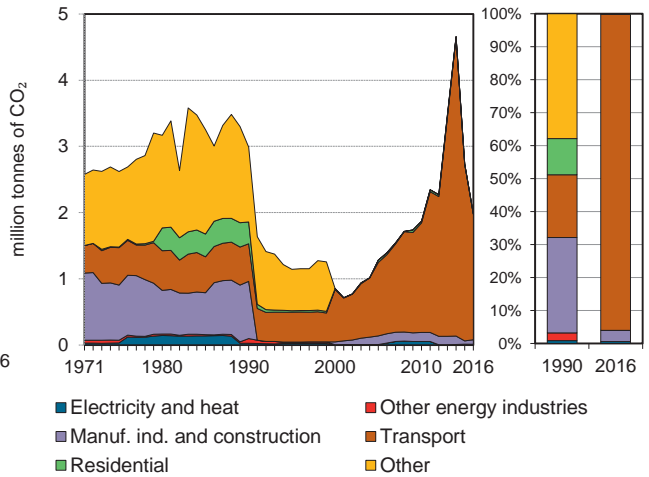


Figure 3. Electricity generation by fuel

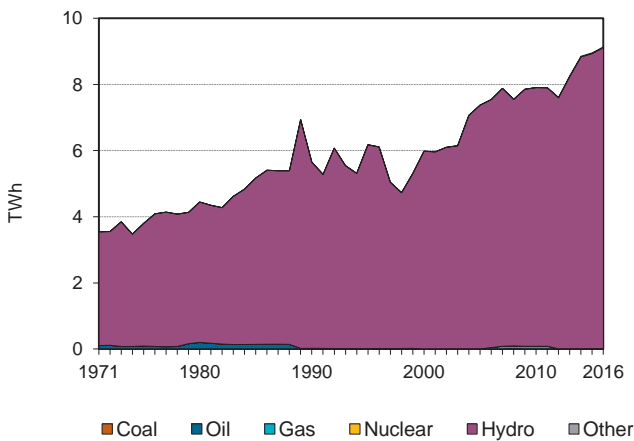


Figure 4. CO₂ from electricity generation: driving factors¹

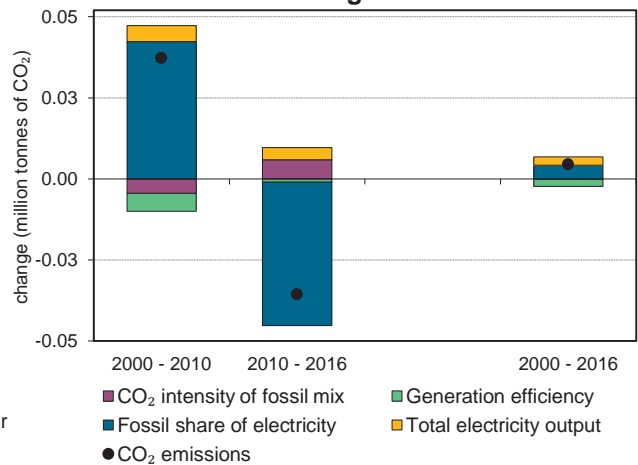


Figure 5. Changes in selected indicators

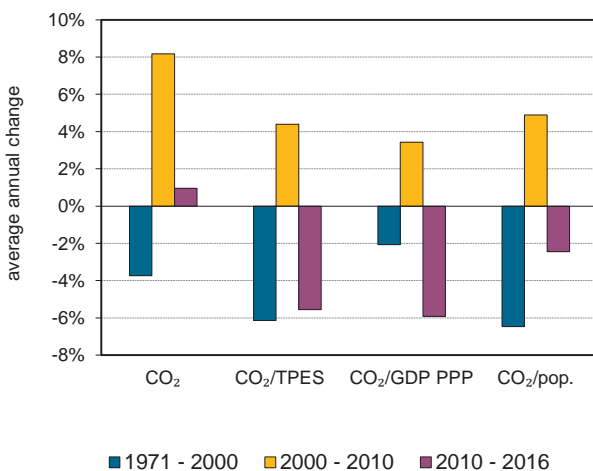
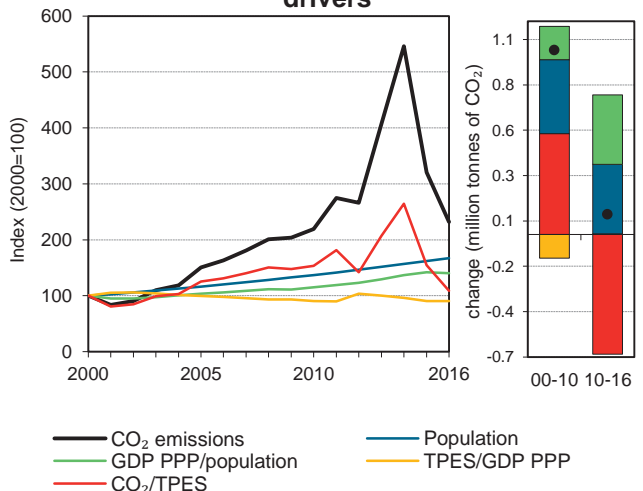


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Democratic Republic of the Congo

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	3	1.1	0.9	1.3	1.9	2.7	2.0	-34%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	494	537	582	698	831	1 210	1 240	151%
GDP (billion 2010 USD)	23.1	15.9	13.0	15.7	20.5	29.8	30.5	32%
GDP PPP (billion 2010 USD)	43.4	29.8	24.4	29.4	38.5	56.0	57.4	32%
Population (millions)	34.6	41.6	47.1	54.8	64.5	76.2	78.7	127%
CO ₂ / TPES (tCO ₂ per TJ)	6.1	2.1	1.5	1.8	2.2	2.3	1.6	-74%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.13	0.1	0.1	0.1	0.1	0.1	0.1	-50%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.07	0.0	0.0	0.0	0.0	0.0	0.0	-51%
CO ₂ / population (tCO ₂ per capita)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	-71%
Share of electricity output from fossil fuels	0%	0%	0%	0%	1%	0%	0%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	5	4	1	1	7	1	1	-75%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	38	29	43	63	91	66	-34%
Population index	100	120	136	158	186	220	227	127%
GDP PPP per population index	100	57	41	43	48	59	58	-42%
Energy intensity index - TPES / GDP PPP	100	159	210	208	190	190	190	90%
Carbon intensity index - CO ₂ / TPES	100	35	24	30	37	37	26	-74%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	2.0	0.0	-	2.0	-34%
Electricity and heat generation	-	0.0	0.0	-	0.0	-60%
Other energy industry own use	-	-	-	-	-	-100%
Manufacturing industries and construction	-	0.1	-	-	0.1	-92%
Transport	-	1.9	-	-	1.9	234%
<i>of which: road</i>	-	1.6	-	-	1.6	184%
Other	-	0.0	-	-	0.0	-100%
<i>of which: residential</i>	-	0.0	-	-	0.0	-99%
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-100%
<i>Memo: international aviation bunkers</i>	-	0.4	-	-	0.4	13%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	1.6	0.6	1.2	1.2
Other transport - oil	0.3	-	0.2	1.4
Manufacturing industries - oil	0.1	0.2	0.1	1.5
Main activity prod. elec. and heat - oil	0.0	0.0	0.0	1.5
Residential - oil	0.0	0.1	0.0	1.5
Unallocated autoproducers - gas	0.0	-	0.0	1.5
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	2.0	3	1.5	1.5

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Denmark

Figure 1. CO₂ emissions by fuel

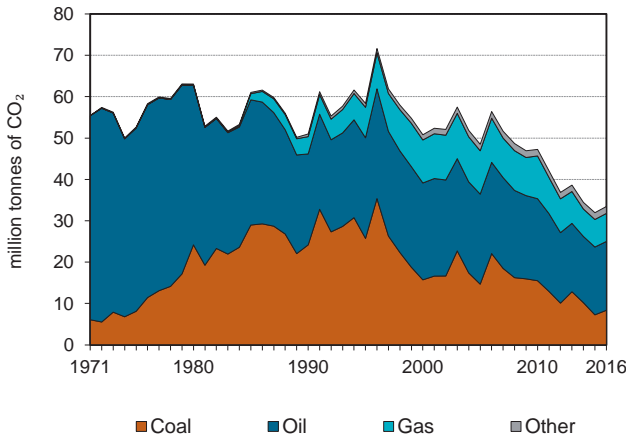


Figure 2. CO₂ emissions by sector

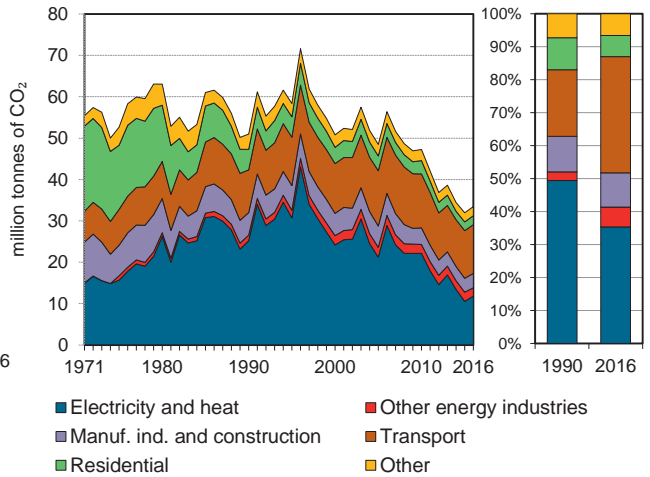


Figure 3. Electricity generation by fuel

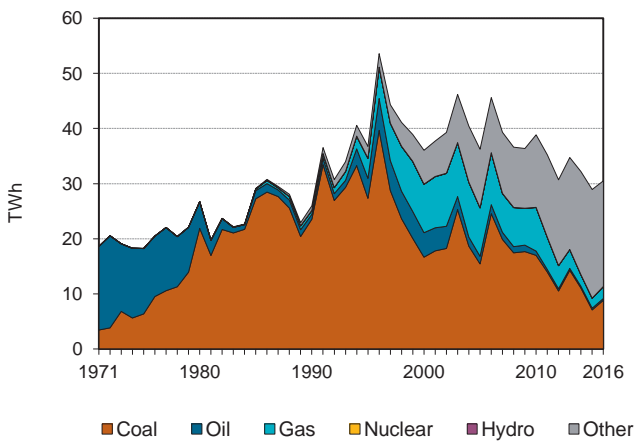


Figure 4. CO₂ from electricity generation: driving factors¹

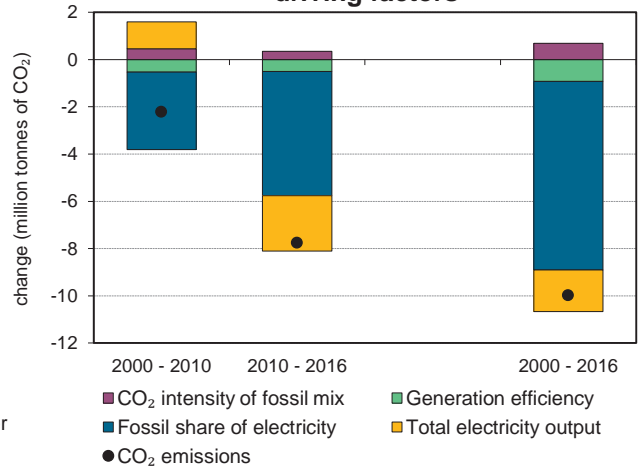


Figure 5. Changes in selected indicators

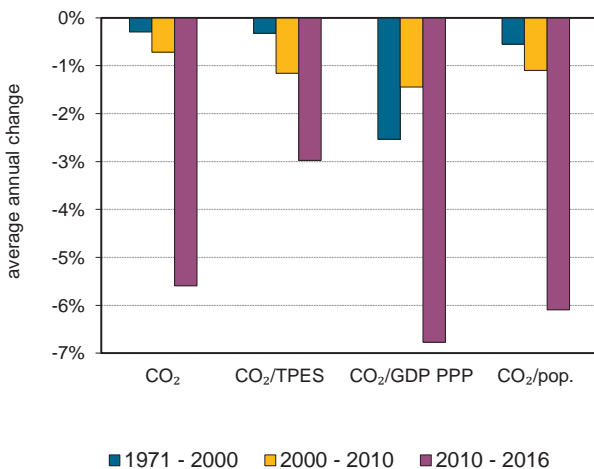
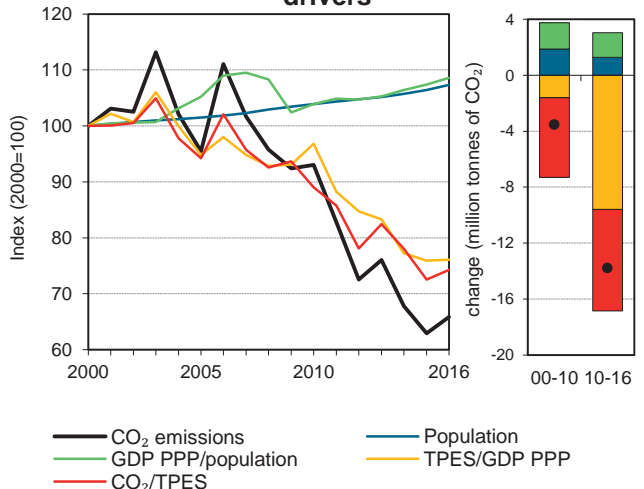


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Denmark

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	51	58.4	50.8	48.5	47.3	32.0	33.5	-34%
Share of World CO ₂ from fuel combustion	0.3%	0.3%	0.2%	0.2%	0.2%	0.1%	0.1%	
TPES (PJ)	727	812	781	791	816	677	692	-5%
GDP (billion 2010 USD)	229.1	257.1	298.2	318.6	322.0	340.8	347.5	52%
GDP PPP (billion 2010 USD)	170.1	190.8	221.4	236.5	239.0	253.0	258.0	52%
Population (millions)	5.1	5.2	5.3	5.4	5.5	5.7	5.7	11%
CO ₂ / TPES (tCO ₂ per TJ)	70.1	71.9	65.1	61.3	57.9	47.2	48.3	-31%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.22	0.2	0.2	0.2	0.1	0.1	0.1	-57%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.3	0.3	0.2	0.2	0.2	0.1	0.1	-57%
CO ₂ / population (tCO ₂ per capita)	9.9	11.2	9.5	8.9	8.5	5.6	5.8	-41%
Share of electricity output from fossil fuels	97%	95%	84%	73%	68%	35%	40%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	682	596	452	374	362	174	207	-70%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	115	100	95	93	63	66	-34%
Population index	100	102	104	105	108	111	111	11%
GDP PPP per population index	100	110	125	132	130	135	136	36%
Energy intensity index - TPES / GDP PPP	100	100	83	78	80	63	63	-37%
Carbon intensity index - CO ₂ / TPES	100	102	93	87	83	67	69	-31%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	8.4	16.6	6.8	1.7	33.5	-34%
Electricity and heat generation	7.9	0.3	2.1	1.6	11.8	-53%
Other energy industry own use	-	0.8	1.2	-	2.0	48%
Manufacturing industries and construction	0.4	1.5	1.5	0.1	3.5	-36%
Transport	-	11.8	0.0	-	11.8	14%
<i>of which: road</i>	-	10.9	0.0	-	10.9	18%
Other	0.1	2.3	2.0	0.0	4.4	-50%
<i>of which: residential</i>	0.0	0.7	1.4	-	2.2	-56%
<i>of which: services</i>	0.0	0.2	0.4	0.0	0.6	-55%
<i>Memo: international marine bunkers</i>	-	2.1	-	-	2.1	-31%
<i>Memo: international aviation bunkers</i>	-	2.8	-	-	2.8	63%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	10.9	9.2	22.7	22.7
Main activity prod. elec. and heat - coal	7.9	22.4	16.5	39.1
Main activity prod. elec. and heat - gas	1.9	1.0	4.0	43.1
Non-specified other - oil	1.6	3.0	3.3	46.4
Manufacturing industries - gas	1.5	1.3	3.1	49.6
Manufacturing industries - oil	1.5	2.9	3.1	52.7
Residential - gas	1.4	0.9	3.0	55.7
Other energy industry own use - gas	1.2	0.5	2.6	58.3
Unallocated autoproducers - other	1.2	0.5	2.5	60.8
<i>Memo: total CO₂ from fuel combustion</i>	33.5	51	69.8	69.8

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Dominican Republic

Figure 1. CO₂ emissions by fuel

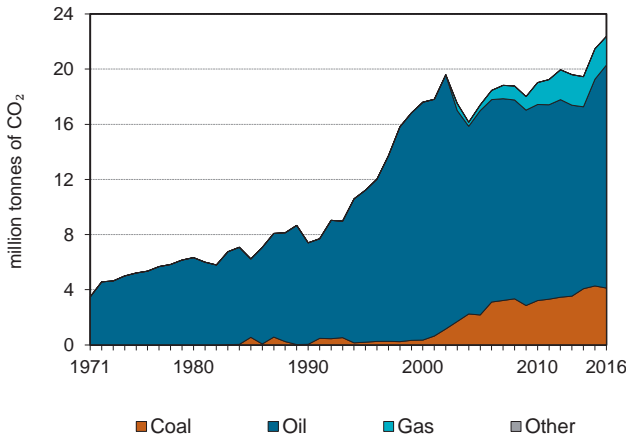


Figure 2. CO₂ emissions by sector

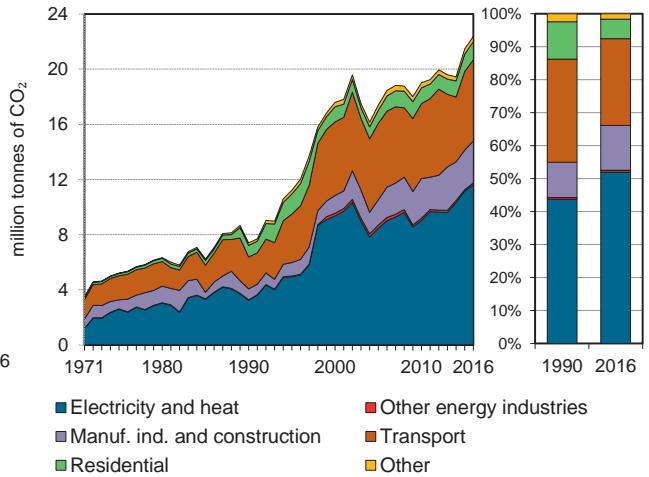


Figure 3. Electricity generation by fuel

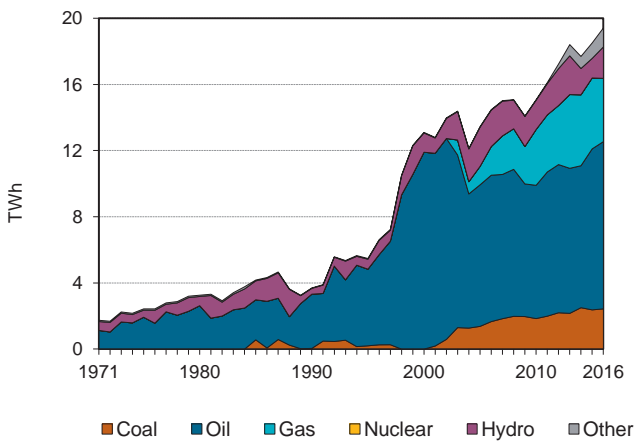


Figure 4. CO₂ from electricity generation: driving factors¹

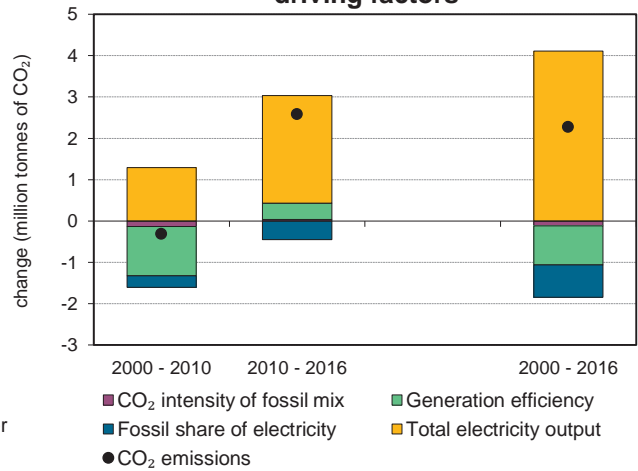


Figure 5. Changes in selected indicators

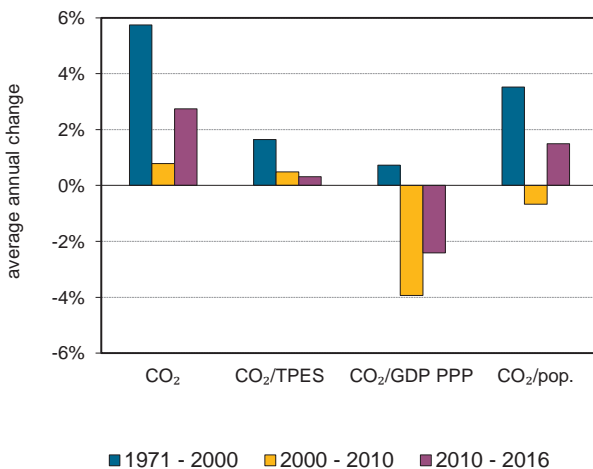
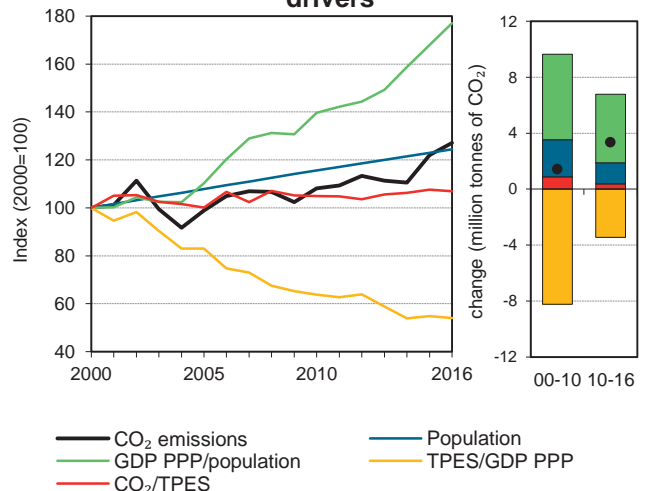


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Dominican Republic

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	7.4	11.2	17.6	17.4	19.0	21.5	22.4	202%
Share of World CO ₂ from fuel combustion	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	
TPES (PJ)	168	220	308	304	318	349	367	118%
GDP (billion 2010 USD)	18.5	23.9	33.4	39.7	54.0	69.0	73.6	297%
GDP PPP (billion 2010 USD)	37.1	47.9	66.8	79.5	107.9	137.9	147.1	297%
Population (millions)	7.2	7.9	8.6	9.2	9.9	10.5	10.6	48%
CO ₂ / TPES (tCO ₂ per TJ)	44.1	51.1	57.1	57.2	59.9	61.4	61.0	38%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.4	0.5	0.5	0.4	0.4	0.3	0.3	-24%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.2	0.2	0.3	0.2	0.2	0.2	0.2	-24%
CO ₂ / population (tCO ₂ per capita)	1	1.4	2.1	1.9	1.9	2.0	2.1	104%
Share of electricity output from fossil fuels	90%	88%	91%	82%	88%	89%	84%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	877	905	715	630	600	604	598	-32%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	152	238	235	257	290	302	202%
Population index	100	110	119	129	138	147	148	48%
GDP PPP per population index	100	118	151	167	211	254	268	168%
Energy intensity index - TPES / GDP PPP	100	101	102	85	65	56	55	-45%
Carbon intensity index - CO ₂ / TPES	100	116	130	130	136	139	138	38%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	4.1	16.2	2.1	-	22.4	202%
Electricity and heat generation	2.4	7.4	1.8	-	11.6	258%
Other energy industry own use	-	0.1	-	-	0.1	347%
Manufacturing industries and construction	1.8	1.1	0.2	-	3.0	282%
Transport	-	5.8	0.0	-	5.9	154%
<i>of which: road</i>	-	4.5	-	-	4.5	104%
Other	-	1.7	-	-	1.7	66%
<i>of which: residential</i>	-	1.3	-	-	1.3	57%
<i>of which: services</i>	-	0.2	-	-	0.2	126%
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	1.6	-	-	1.6	+

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	4.5	2.2	11.9	11.9
Main activity prod. elec. and heat - oil	4.5	1.8	11.8	23.7
Unallocated autoproducers - oil	2.9	1.4	7.7	31.4
Main activity prod. elec. and heat - coal	2.4	0.0	6.2	37.6
Main activity prod. elec. and heat - gas	1.8	-	4.7	42.4
Manufacturing industries - coal	1.8	-	4.6	47.0
Residential - oil	1.3	0.8	3.5	50.4
Other transport - oil	1.3	0.1	3.4	53.8
Manufacturing industries - oil	1.1	0.8	2.8	56.7
<i>Memo: total CO₂ from fuel combustion</i>	<i>22.4</i>	<i>7.4</i>	<i>58.7</i>	<i>58.7</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Ecuador

Figure 1. CO₂ emissions by fuel

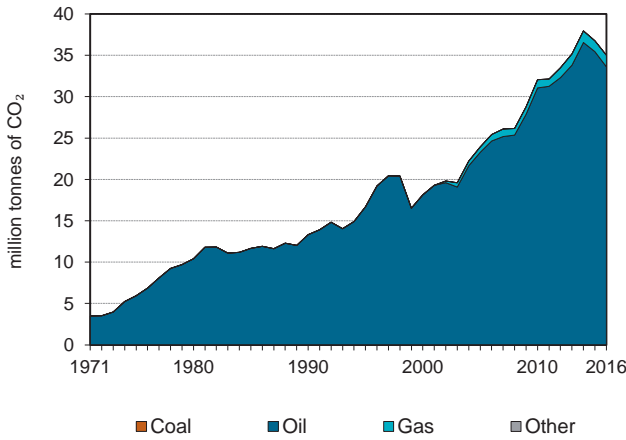


Figure 2. CO₂ emissions by sector

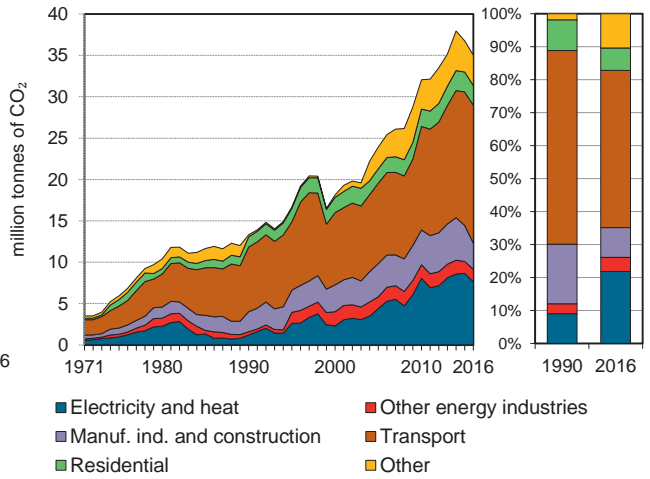


Figure 3. Electricity generation by fuel

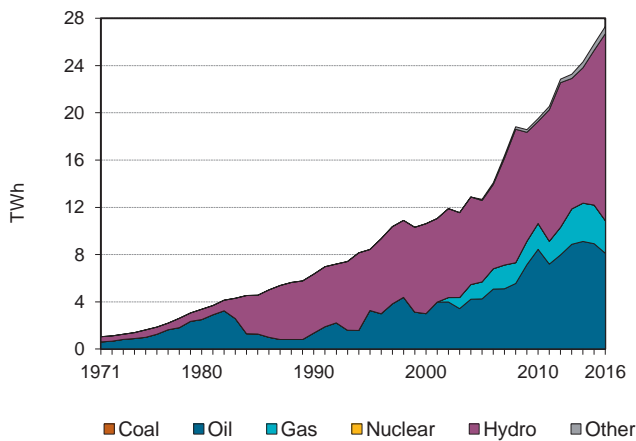


Figure 4. CO₂ from electricity generation: driving factors¹

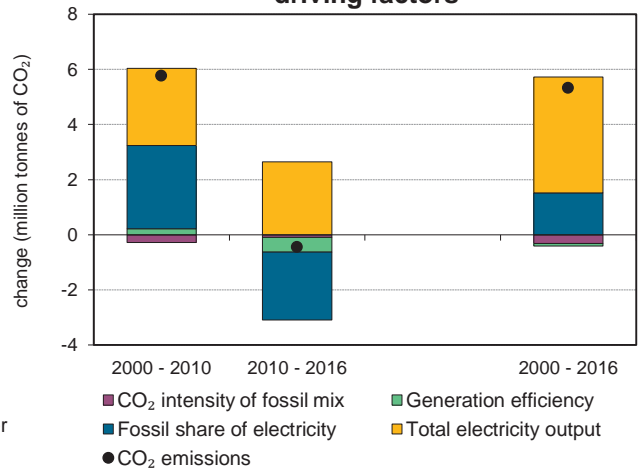


Figure 5. Changes in selected indicators

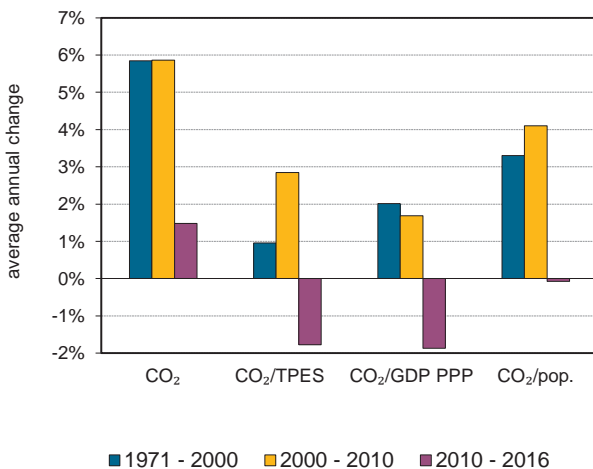
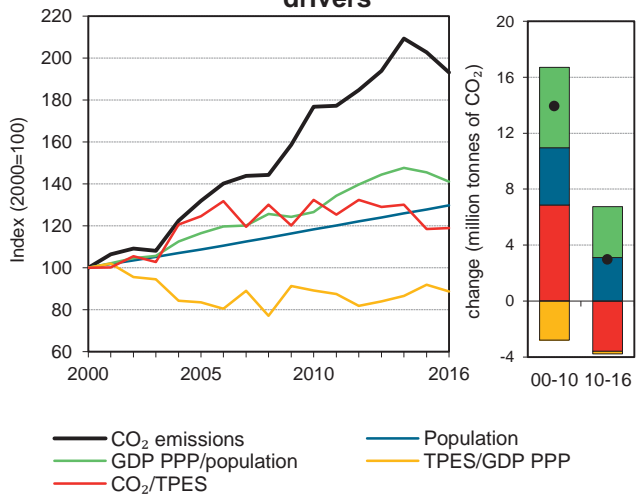


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Ecuador

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	13.3	16.7	18.1	23.9	32.1	36.8	35.0	163%
Share of World CO ₂ from fuel combustion	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	
TPES (PJ)	265	330	369	391	493	631	599	126%
GDP (billion 2010 USD)	38	44.0	46.5	58.9	69.6	86.6	85.4	125%
GDP PPP (billion 2010 USD)	74.8	86.6	91.4	115.8	136.8	170.0	167.3	124%
Population (millions)	10.2	11.4	12.6	13.7	14.9	16.1	16.4	60%
CO ₂ / TPES (tCO ₂ per TJ)	50.3	50.7	49.1	61.2	65.1	58.2	58.4	16%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.35	0.4	0.4	0.4	0.5	0.4	0.4	17%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.18	0.2	0.2	0.2	0.2	0.2	0.2	17%
CO ₂ / population (tCO ₂ per capita)	1.3	1.5	1.4	1.7	2.1	2.3	2.1	64%
Share of electricity output from fossil fuels	22%	39%	28%	45%	55%	47%	40%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	189	311	218	347	414	335	280	48%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	125	136	180	241	276	263	163%
Population index	100	112	124	134	146	158	160	60%
GDP PPP per population index	100	103	99	115	125	144	140	40%
Energy intensity index - TPES / GDP PPP	100	107	114	95	102	105	101	1%
Carbon intensity index - CO ₂ / TPES	100	101	98	122	129	116	116	16%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	33.6	1.4	-	35.0	163%
Electricity and heat generation	-	6.3	1.3	-	7.6	535%
Other energy industry own use	-	1.5	0.0	-	1.5	274%
Manufacturing industries and construction	-	3.1	0.1	-	3.2	31%
Transport	-	16.7	-	-	16.7	113%
<i>of which: road</i>	-	15.9	-	-	15.9	147%
Other	-	6.0	0.0	-	6.0	307%
<i>of which: residential</i>	-	2.4	0.0	-	2.4	92%
<i>of which: services</i>	-	1.1	-	-	1.1	+
<i>Memo: international marine bunkers</i>	-	0.9	-	-	0.9	83%
<i>Memo: international aviation bunkers</i>	-	1.0	-	-	1.0	161%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	15.9	6.4	23.1	23.1
Main activity prod. elec. and heat - oil	4.2	1.2	6.1	29.2
Non-specified other - oil	3.7	0.2	5.3	34.5
Manufacturing industries - oil	3.1	2.4	4.5	39.0
Residential - oil	2.4	1.2	3.5	42.5
Unallocated autoproducers - oil	2.2	-	3.1	45.6
Other energy industry own use - oil	1.5	0.4	2.2	47.8
Other transport - oil	0.8	1.4	1.2	49.0
Main activity prod. elec. and heat - gas	0.8	-	1.2	50.2
<i>Memo: total CO₂ from fuel combustion</i>	<i>35.0</i>	<i>13.3</i>	<i>51.1</i>	<i>51.1</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Egypt

Figure 1. CO₂ emissions by fuel

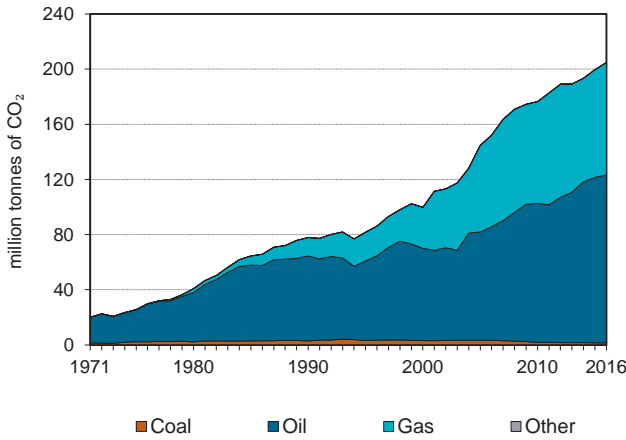


Figure 2. CO₂ emissions by sector

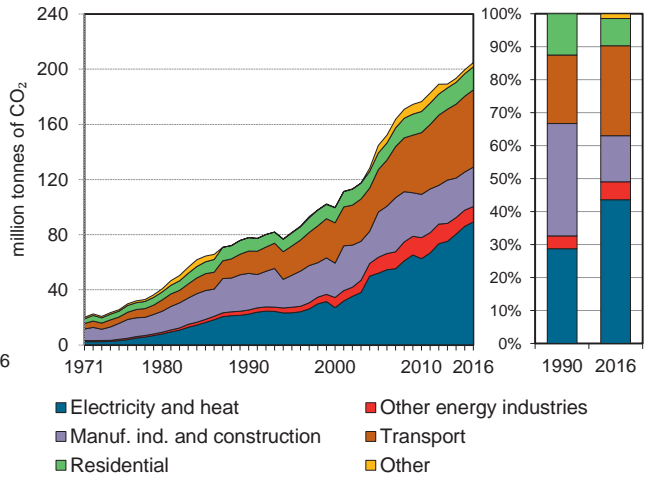


Figure 3. Electricity generation by fuel

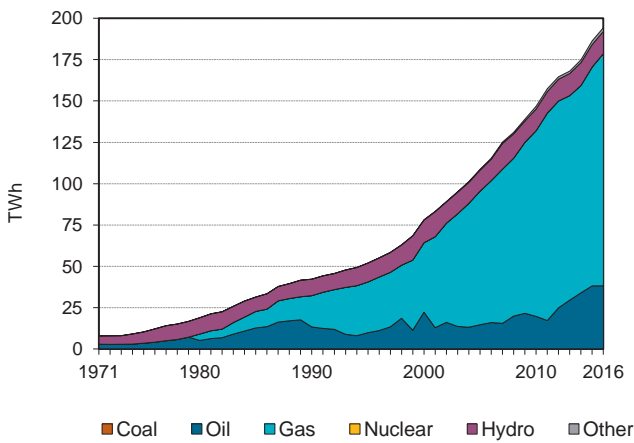


Figure 4. CO₂ from electricity generation: driving factors¹

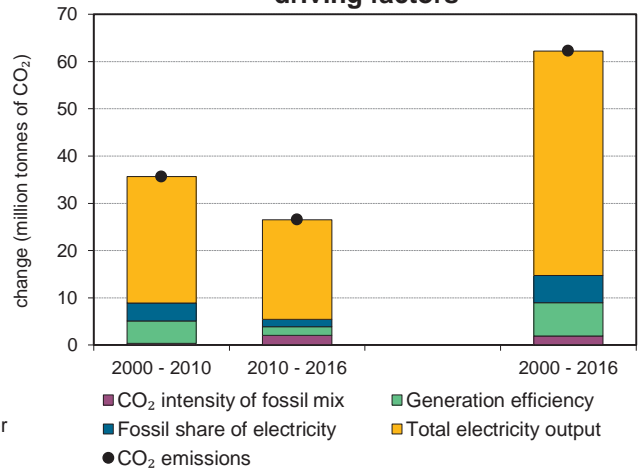


Figure 5. Changes in selected indicators

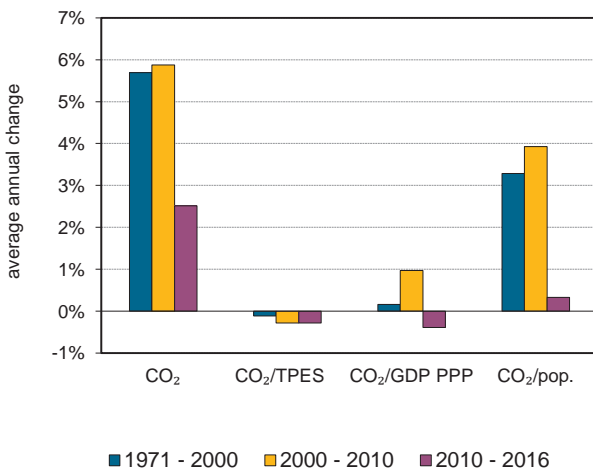
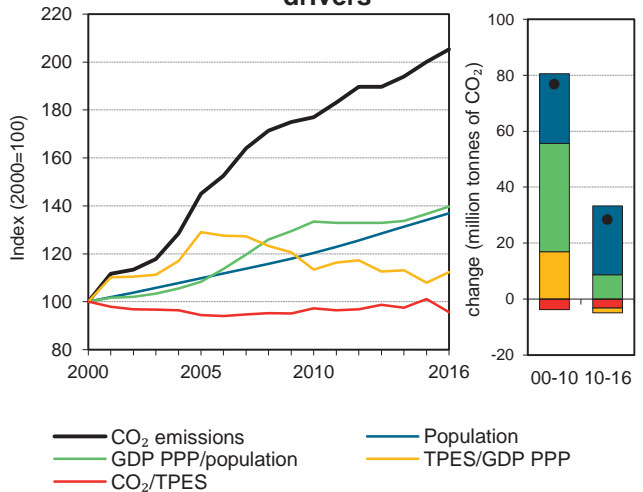


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Egypt

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	77.9	81.7	99.7	144.7	176.5	199.6	204.8	163%
Share of World CO ₂ from fuel combustion	0.4%	0.4%	0.4%	0.5%	0.6%	0.6%	0.6%	
TPES (PJ)	1350	1 471	1 679	2 578	3 056	3 322	3 608	167%
GDP (billion 2010 USD)	89.6	105.9	136.4	162.2	218.9	250.0	260.7	191%
GDP PPP (billion 2010 USD)	332.4	392.8	506.0	601.9	812.3	927.6	967.5	191%
Population (millions)	57.4	63.7	69.9	76.8	84.1	93.8	95.7	67%
CO ₂ / TPES (tCO ₂ per TJ)	57.7	55.5	59.4	56.1	57.7	60.1	56.8	-2%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.87	0.8	0.7	0.9	0.8	0.8	0.8	-10%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.23	0.2	0.2	0.2	0.2	0.2	0.2	-9%
CO ₂ / population (tCO ₂ per capita)	1.4	1.3	1.4	1.9	2.1	2.1	2.1	58%
Share of electricity output from fossil fuels	77%	78%	82%	88%	90%	92%	92%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	530	448	347	479	427	462	460	-13%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	105	128	186	227	256	263	163%
Population index	100	111	122	134	146	163	167	67%
GDP PPP per population index	100	106	125	135	167	171	175	75%
Energy intensity index - TPES / GDP PPP	100	92	82	105	93	88	92	-8%
Carbon intensity index - CO ₂ / TPES	100	96	103	97	100	104	98	-2%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	1.5	121.8	81.5	-	204.8	163%
Electricity and heat generation	-	32.1	57.2	-	89.3	299%
Other energy industry own use	-	2.7	8.5	-	11.1	273%
Manufacturing industries and construction	1.5	15.7	11.4	-	28.6	8%
Transport	-	55.2	0.8	-	56.0	247%
<i>of which: road</i>	-	52.5	0.8	-	53.2	244%
Other	0.0	16.1	3.7	-	19.8	103%
<i>of which: residential</i>	0.0	13.0	3.7	-	16.7	71%
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	0.6	-	-	0.6	-89%
<i>Memo: international aviation bunkers</i>	-	1.7	-	-	1.7	277%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - gas	57.2	9.3	17.5	17.5
Road - oil	52.5	15.5	16.1	33.6
Main activity prod. elec. and heat - oil	32.1	13.0	9.8	43.4
Manufacturing industries - oil	15.7	20.6	4.8	48.2
Residential - oil	13.0	9.6	4.0	52.2
Manufacturing industries - gas	11.4	3.1	3.5	55.7
Other energy industry own use - gas	8.5	0.8	2.6	58.3
Residential - gas	3.7	0.2	1.1	59.4
Non-specified other - oil	3.1	-	0.9	60.4
<i>Memo: total CO₂ from fuel combustion</i>	<i>204.8</i>	<i>77.9</i>	<i>62.7</i>	<i>62.7</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

El Salvador

Figure 1. CO₂ emissions by fuel

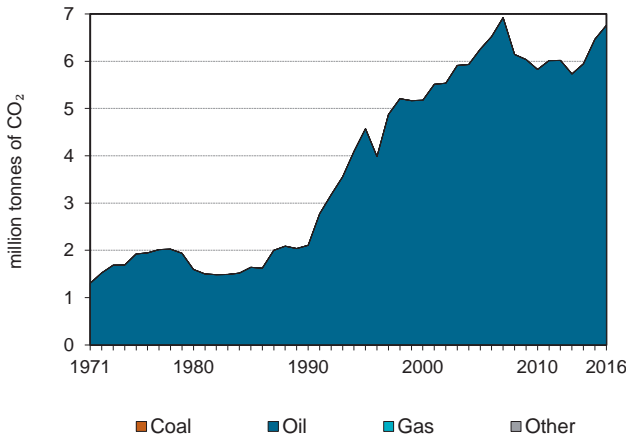


Figure 2. CO₂ emissions by sector

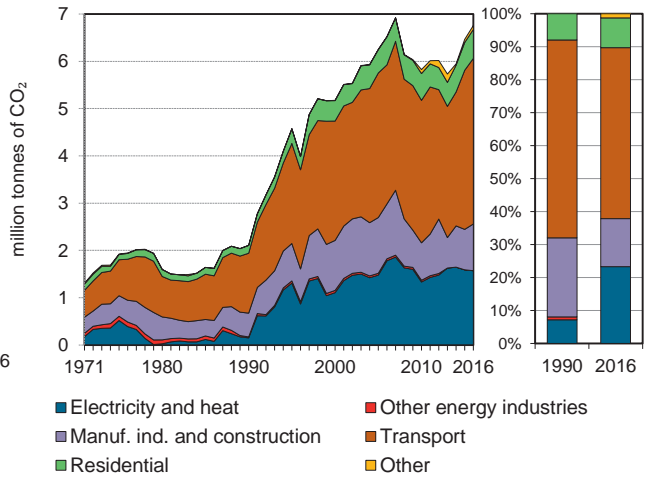


Figure 3. Electricity generation by fuel

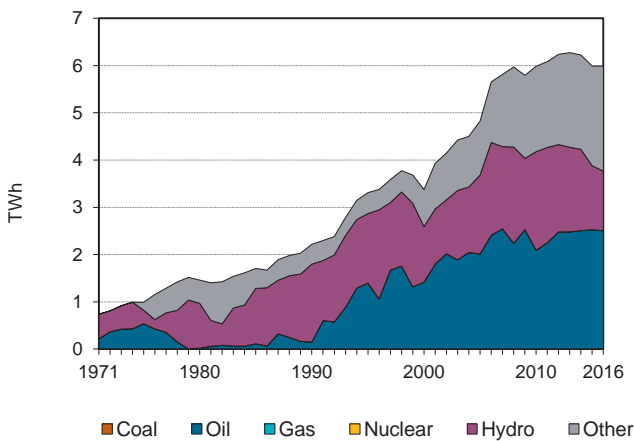


Figure 4. CO₂ from electricity generation: driving factors¹

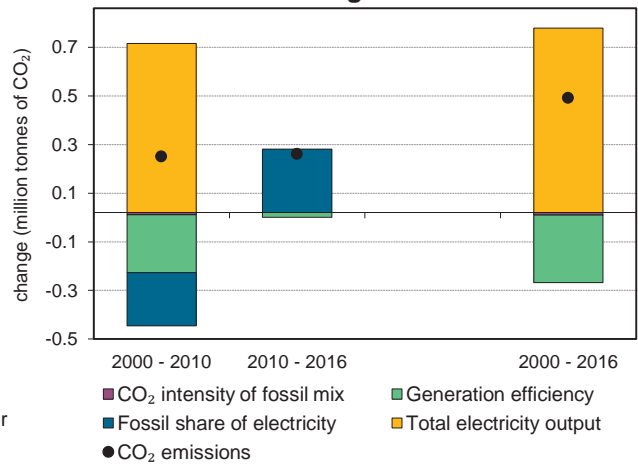


Figure 5. Changes in selected indicators

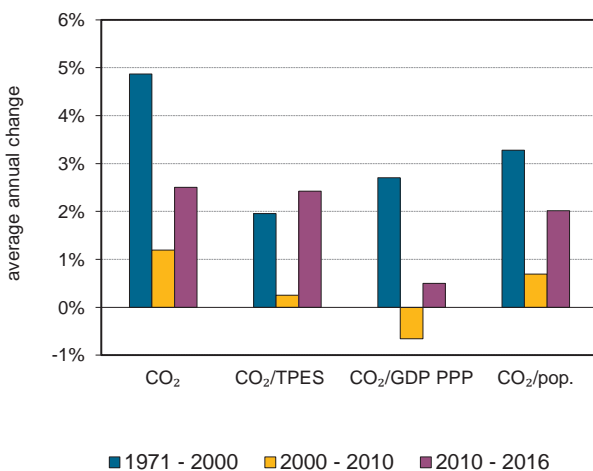
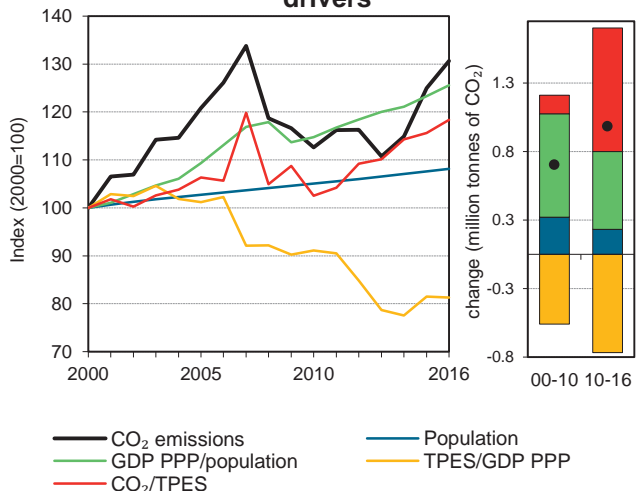


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

El Salvador

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	2.1	4.6	5.2	6.3	5.8	6.5	6.8	221%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	103	141	166	189	182	180	183	77%
GDP (billion 2010 USD)	11.3	15.3	17.8	20.0	21.4	23.6	24.1	113%
GDP PPP (billion 2010 USD)	23.3	31.5	36.6	41.1	44.1	48.5	49.7	113%
Population (millions)	5.3	5.6	5.9	6.0	6.2	6.3	6.3	21%
CO ₂ / TPES (tCO ₂ per TJ)	20.4	32.5	31.2	33.1	31.9	36.0	36.9	81%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.19	0.3	0.3	0.3	0.3	0.3	0.3	51%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.09	0.1	0.1	0.2	0.1	0.1	0.1	51%
CO ₂ / population (tCO ₂ per capita)	0.4	0.8	0.9	1.0	0.9	1.0	1.1	166%
Share of electricity output from fossil fuels	7%	42%	42%	42%	35%	42%	42%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	68	395	328	306	223	265	263	288%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	217	246	297	277	307	321	221%
Population index	100	107	112	115	117	120	121	21%
GDP PPP per population index	100	126	140	154	161	173	176	76%
Energy intensity index - TPES / GDP PPP	100	101	102	104	93	83	83	-17%
Carbon intensity index - CO ₂ / TPES	100	160	153	163	157	177	181	81%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	6.8	-	-	6.8	221%
Electricity and heat generation	-	1.6	-	-	1.6	947%
Other energy industry own use	-	-	-	-	-	-100%
Manufacturing industries and construction	-	1.0	-	-	1.0	96%
Transport	-	3.5	-	-	3.5	177%
<i>of which: road</i>	-	3.5	-	-	3.5	177%
Other	-	0.7	-	-	0.7	318%
<i>of which: residential</i>	-	0.6	-	-	0.6	267%
<i>of which: services</i>	-	0.1	-	-	0.1	x
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.5	-	-	0.5	364%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	3.5	1.3	29.7	29.7
Main activity prod. elec. and heat - oil	1.5	0.2	12.4	42.1
Manufacturing industries - oil	1.0	0.5	8.4	50.5
Residential - oil	0.6	0.2	5.2	55.7
Unallocated autoproducers - oil	0.1	-	1.0	56.6
Non-specified other - oil	0.1	-	0.7	57.3
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	6.8	2.1	57.3	57.3

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Eritrea ¹

Figure 1. CO₂ emissions by fuel

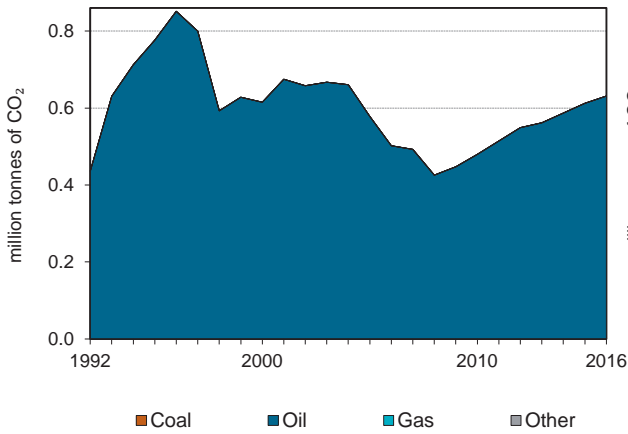


Figure 2. CO₂ emissions by sector

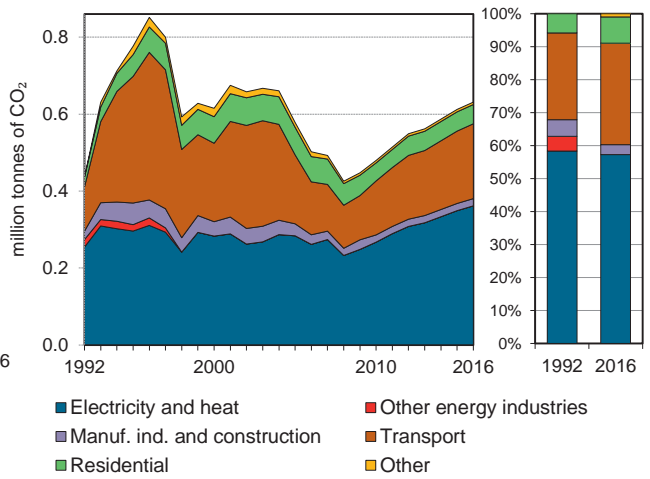


Figure 3. Electricity generation by fuel

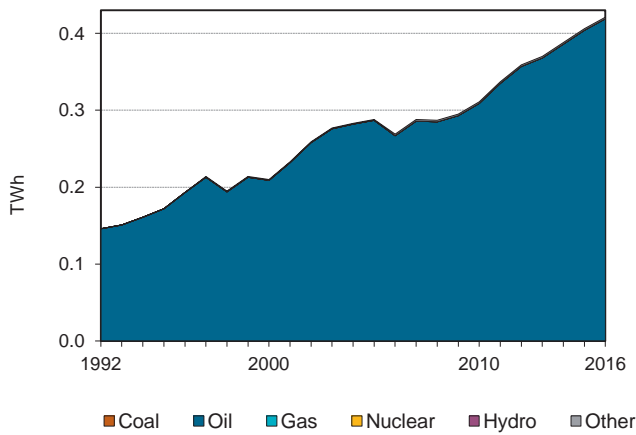


Figure 4. CO₂ from electricity generation: driving factors²

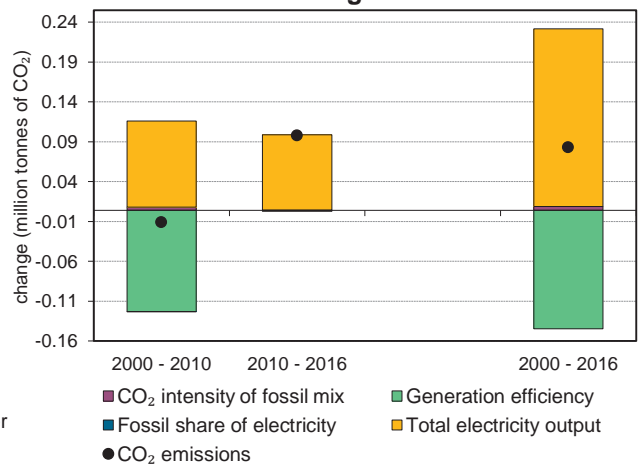


Figure 5. Changes in selected indicators

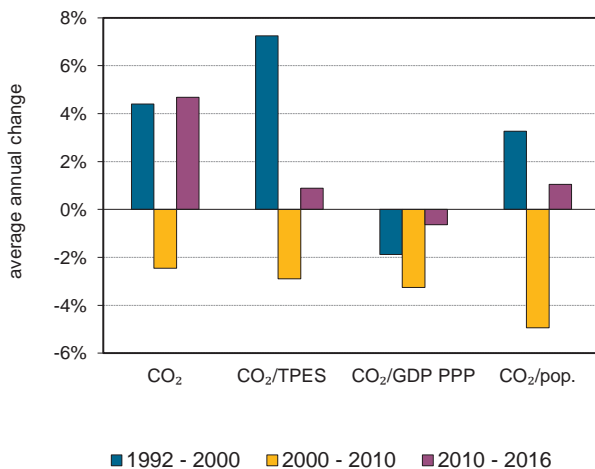
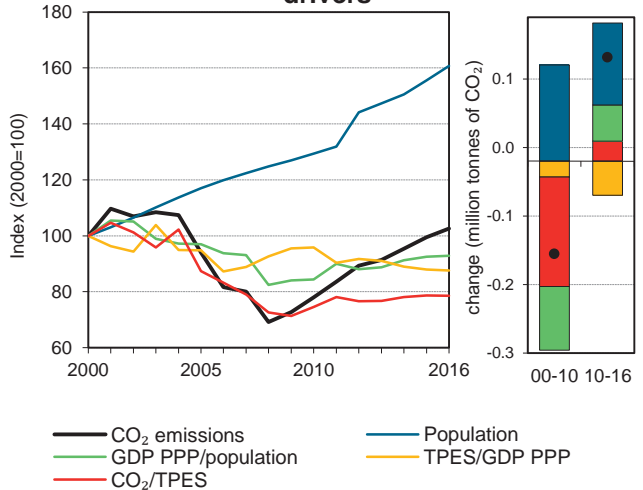


Figure 6. Total CO₂ emissions and drivers³



1. Prior to 1992, data for Eritrea were included in Ethiopia.

2. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.

3. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Eritrea ¹

Key indicators

	1990	1992	2000	2005	2010	2015	2016	%change 92-16
CO ₂ fuel combustion (MtCO ₂)	..	0.4	0.6	0.6	0.5	0.6	0.6	45%
Share of World CO ₂ from fuel combustion	..	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	..	37	30	32	31	38	39	5%
GDP (billion 2010 USD)	..	1.2	1.9	2.2	2.1	2.8	2.9	145%
GDP PPP (billion 2010 USD)	..	3.4	5.6	6.3	6.1	8.0	8.3	145%
Population (millions)	..	3.1	3.4	4.0	4.4	5.3	5.5	75%
CO ₂ / TPES (tCO ₂ per TJ)	..	11.9	20.7	18.1	15.5	16.3	16.3	37%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	..	0.4	0.3	0.3	0.2	0.2	0.2	-41%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	..	0.1	0.1	0.1	0.1	0.1	0.1	-41%
CO ₂ / population (tCO ₂ per capita)	..	0.1	0.2	0.1	0.1	0.1	0.1	-17%
Share of electricity output from fossil fuels	..	100%	100%	100%	99%	100%	100%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	..	1742	1347	985	859	860	859	-51%
CO₂ emissions and drivers - Kaya decomposition (1992=100) ²								
CO ₂ emissions index	..	100	141	133	110	141	145	45%
Population index	..	100	109	127	141	169	175	75%
GDP PPP per population index	..	100	151	147	127	140	140	40%
Energy intensity index - TPES / GDP PPP	..	100	49	47	47	43	43	-57%
Carbon intensity index - CO ₂ / TPES	..	100	175	153	130	138	137	37%

1. Prior to 1992, data for Eritrea were included in Ethiopia. 2. Please see the chapter *Indicator sources and methods* in Part I for methodological notes.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ³	Total	%change 92-16
CO₂ fuel combustion	-	0.6	-	-	0.6	45%
Electricity and heat generation	-	0.4	-	-	0.4	42%
Other energy industry own use	-	-	-	-	-	-100%
Manufacturing industries and construction	-	0.0	-	-	0.0	-14%
Transport	-	0.2	-	-	0.2	69%
<i>of which: road</i>	-	0.2	-	-	0.2	69%
Other	-	0.1	-	-	0.1	124%
<i>of which: residential</i>	-	0.1	-	-	0.1	99%
<i>of which: services</i>	-	0.0	-	-	0.0	x
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-100%
<i>Memo: international aviation bunkers</i>	-	0.0	-	-	0.0	-75%

3. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ⁴ (%)	Cumulative total (%)
Main activity prod. elec. and heat - oil	0.3	0.1	5.8	5.8
Road - oil	0.2	0.1	3.2	9.0
Residential - oil	0.1	0.0	0.8	9.8
Manufacturing industries - oil	0.0	0.0	0.3	10.1
Unallocated autoproducers - oil	0.0	0.2	0.2	10.3
Non-specified other - oil	0.0	-	0.1	10.4
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	<i>0.6</i>	<i>..</i>	<i>10.4</i>	<i>10.4</i>

4. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Estonia

Figure 1. CO₂ emissions by fuel

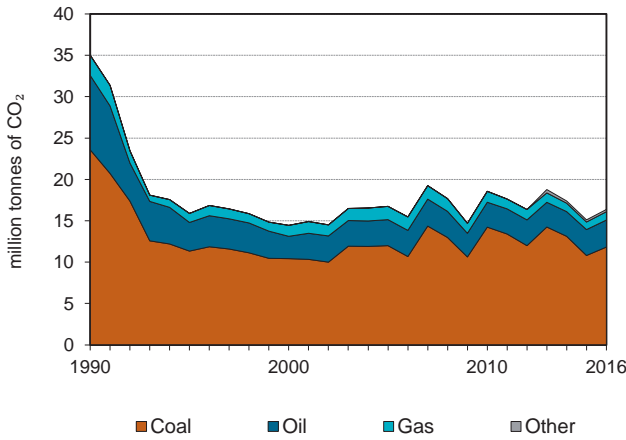


Figure 2. CO₂ emissions by sector

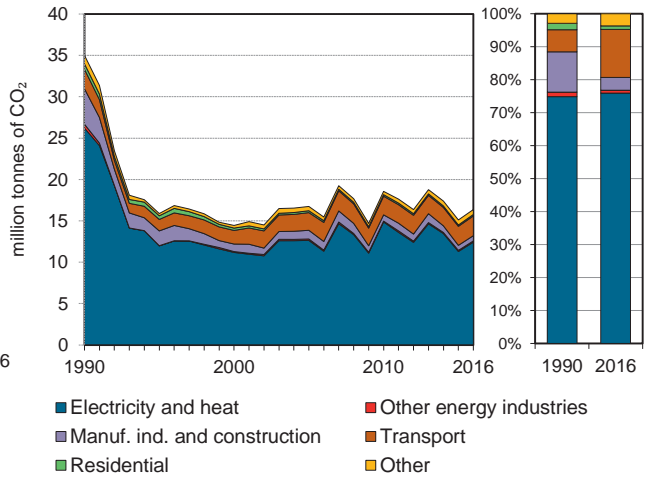


Figure 3. Electricity generation by fuel

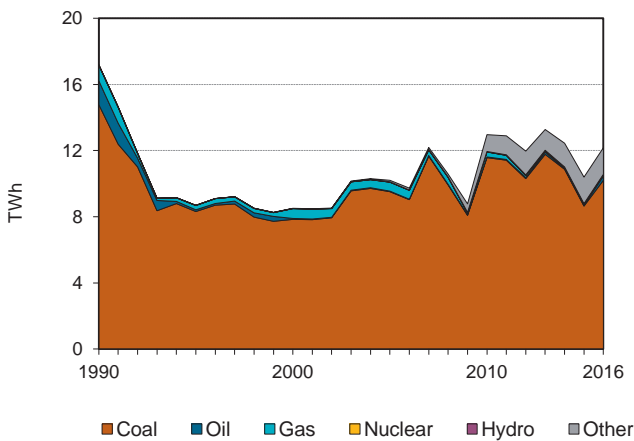


Figure 4. CO₂ from electricity generation: driving factors¹

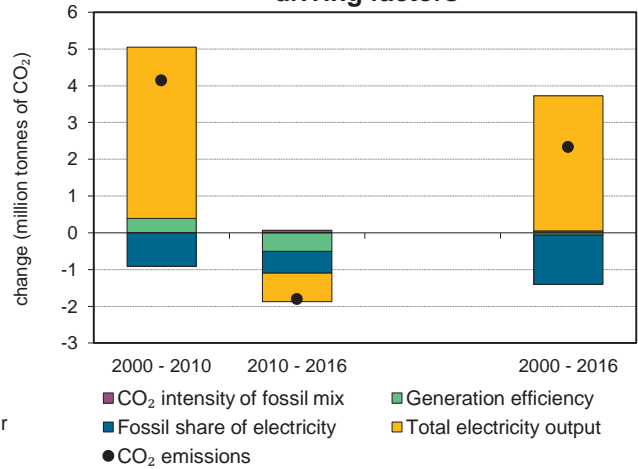


Figure 5. Changes in selected indicators

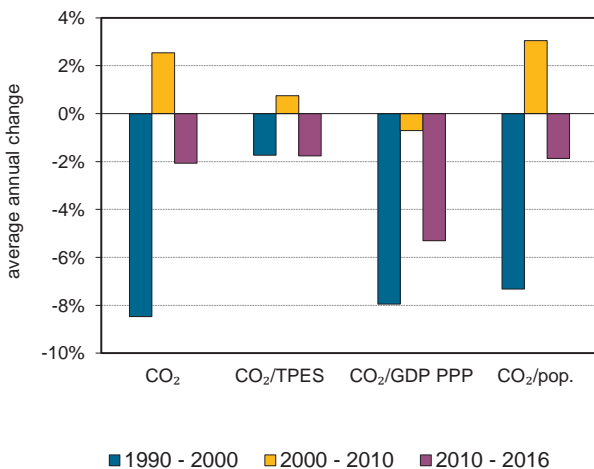
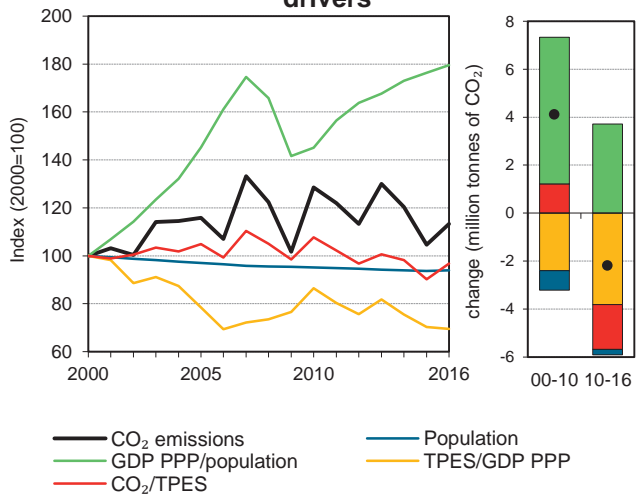


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Estonia

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	35	15.9	14.4	16.7	18.6	15.1	16.4	-53%
Share of World CO ₂ from fuel combustion	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	
TPES (PJ)	402	217	197	218	235	229	231	-42%
GDP (billion 2010 USD)	15	10.5	14.1	19.9	19.5	23.3	23.8	59%
GDP PPP (billion 2010 USD)	22.1	15.5	20.9	29.4	28.8	34.5	35.2	59%
Population (millions)	1.6	1.4	1.4	1.4	1.3	1.3	1.3	-17%
CO ₂ / TPES (tCO ₂ per TJ)	87.2	73.4	73.2	76.7	78.8	66.0	70.8	-19%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	2.34	1.5	1.0	0.8	1.0	0.6	0.7	-71%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	1.59	1.0	0.7	0.6	0.6	0.4	0.5	-71%
CO ₂ / population (tCO ₂ per capita)	22.1	11.0	10.3	12.3	13.9	11.5	12.4	-44%
Share of electricity output from fossil fuels	100%	100%	100%	99%	92%	86%	88%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	956	1087	1075	1061	1025	986	943	-1%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	45	41	48	53	43	47	-53%
Population index	100	91	88	86	84	83	83	-17%
GDP PPP per population index	100	77	107	155	155	189	192	92%
Energy intensity index - TPES / GDP PPP	100	77	52	41	45	37	36	-64%
Carbon intensity index - CO ₂ / TPES	100	84	84	88	90	76	81	-19%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	11.8	3.3	1.0	0.3	16.4	-53%
Electricity and heat generation	11.7	0.2	0.4	0.2	12.4	-53%
Other energy industry own use	0.0	0.1	0.1	-	0.2	-68%
Manufacturing industries and construction	0.1	0.2	0.3	0.1	0.6	-85%
Transport	-	2.4	0.0	-	2.4	1%
<i>of which: road</i>	-	2.3	0.0	-	2.3	5%
Other	0.0	0.4	0.3	-	0.8	-54%
<i>of which: residential</i>	0.0	0.0	0.1	-	0.2	-73%
<i>of which: services</i>	0.0	0.1	0.2	-	0.3	65%
<i>Memo: international marine bunkers</i>	-	0.9	-	-	0.9	51%
<i>Memo: international aviation bunkers</i>	-	0.1	-	-	0.1	-38%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	11.6	20.9	62.8	62.8
Road - oil	2.3	2.2	12.3	75.0
Non-specified other - oil	0.4	0.7	2.1	77.1
Main activity prod. elec. and heat - gas	0.3	1.8	1.7	78.8
Manufacturing industries - gas	0.3	0.4	1.4	80.2
Manufacturing industries - oil	0.2	2.2	1.3	81.5
Main activity prod. elec. and heat - other	0.2	-	1.2	82.7
Non-specified other - gas	0.2	0.0	1.1	83.7
Main activity prod. elec. and heat - oil	0.2	3.0	0.8	84.6
<i>Memo: total CO₂ from fuel combustion</i>	<i>16.4</i>	<i>35</i>	<i>88.5</i>	<i>88.5</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Ethiopia ¹

Figure 1. CO₂ emissions by fuel

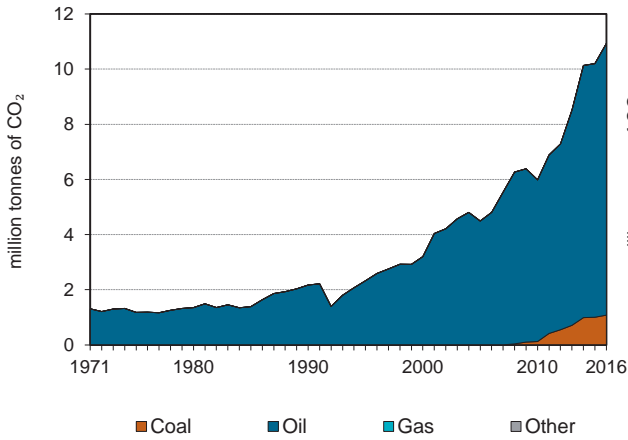


Figure 2. CO₂ emissions by sector

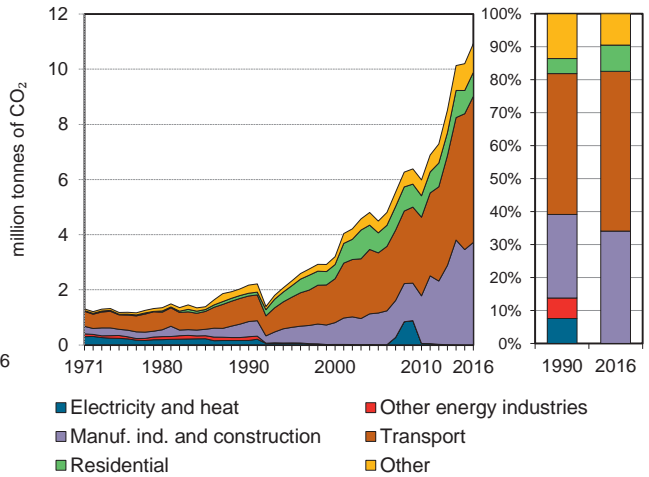


Figure 3. Electricity generation by fuel

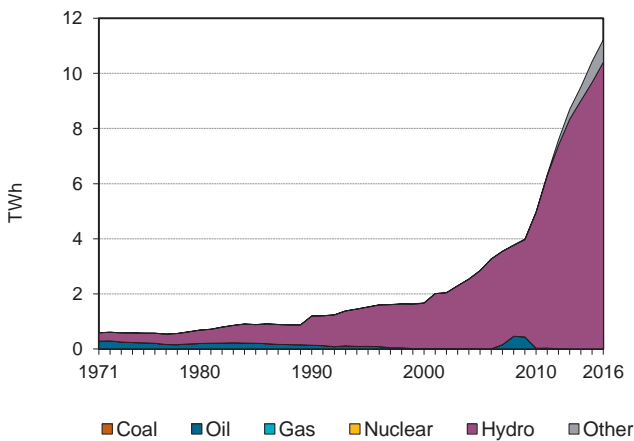


Figure 4. CO₂ from electricity generation: driving factors²

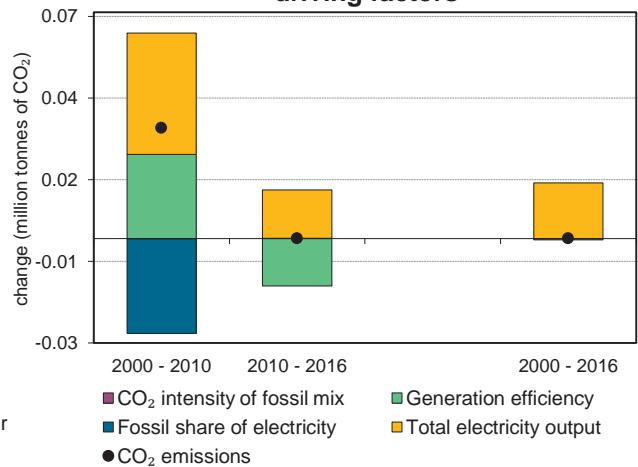


Figure 5. Changes in selected indicators

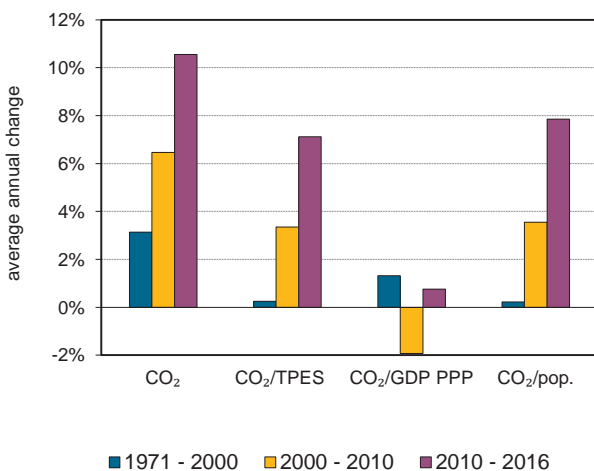
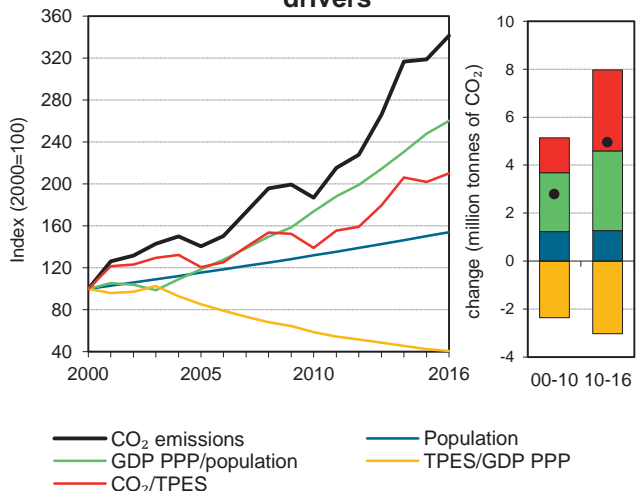


Figure 6. Total CO₂ emissions and drivers³



1. Data for Ethiopia include Eritrea until 1991.

2. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.

3. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Ethiopia ¹

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	2.2	2.3	3.2	4.5	6.0	10.2	10.9	403%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	959	1 142	1 327	1 544	1 785	2 096	2 158	125%
GDP (billion 2010 USD)	10	10.5	13.1	17.9	29.9	48.7	52.3	425%
GDP PPP (billion 2010 USD)	30.7	32.3	40.3	55.1	92.3	150.0	161.4	425%
Population (millions)	48.1	57.3	66.5	76.7	87.7	99.9	102.4	113%
CO ₂ / TPES (tCO ₂ per TJ)	2.3	2.0	2.4	2.9	3.4	4.9	5.1	124%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.22	0.2	0.2	0.3	0.2	0.2	0.2	-4%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.07	0.1	0.1	0.1	0.1	0.1	0.1	-4%
CO ₂ / population (tCO ₂ per capita)	0.1	0.0	0.0	0.1	0.1	0.1	0.1	138%
Share of electricity output from fossil fuels	12%	7%	1%	0%	1%	0%	0%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	137	42	12	3	11	0	0	-100%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ²								
CO ₂ emissions index	100	107	147	207	276	470	503	403%
Population index	100	119	138	160	182	208	213	113%
GDP PPP per population index	100	88	95	112	165	235	247	147%
Energy intensity index - TPES / GDP PPP	100	113	105	90	62	45	43	-57%
Carbon intensity index - CO ₂ / TPES	100	90	107	129	148	215	224	124%

1. Data for Ethiopia include Eritrea until 1991. 2. Please see the chapter *Indicator sources and methods* in Part I for methodological notes.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ³	Total	%change 90-16
CO₂ fuel combustion	1.1	9.9	-	-	10.9	403%
Electricity and heat generation	-	0.0	-	-	0.0	-98%
Other energy industry own use	-	-	-	-	-	-100%
Manufacturing industries and construction	1.1	2.6	-	-	3.7	576%
Transport	-	5.3	-	-	5.3	471%
<i>of which: road</i>	-	5.0	-	-	5.0	444%
Other	-	1.9	-	-	1.9	384%
<i>of which: residential</i>	-	0.9	-	-	0.9	774%
<i>of which: services</i>	-	0.2	-	-	0.2	714%
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-100%
<i>Memo: international aviation bunkers</i>	-	1.4	-	-	1.4	163%

3. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ⁴ (%)	Cumulative total (%)
Road - oil	5.0	0.9	3.2	3.2
Manufacturing industries - oil	2.6	0.5	1.7	4.9
Manufacturing industries - coal	1.1	-	0.7	5.6
Non-specified other - oil	1.0	0.3	0.7	6.2
Residential - oil	0.9	0.1	0.6	6.8
Other transport - oil	0.3	-	0.2	6.9
Main activity prod. elec. and heat - oil	0.0	0.1	0.0	6.9
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	<i>10.9</i>	<i>2.2</i>	<i>6.9</i>	<i>6.9</i>

4. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Finland

Figure 1. CO₂ emissions by fuel

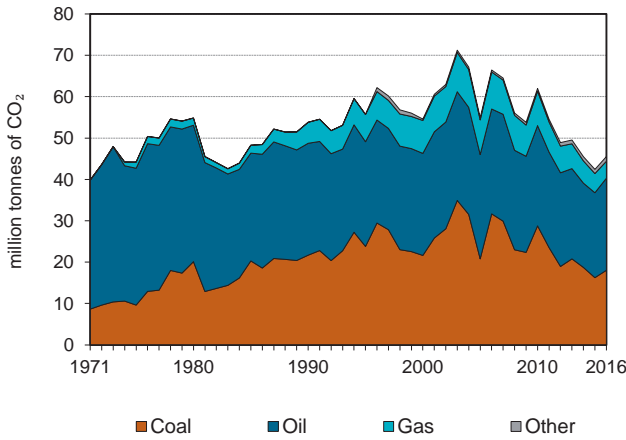


Figure 2. CO₂ emissions by sector

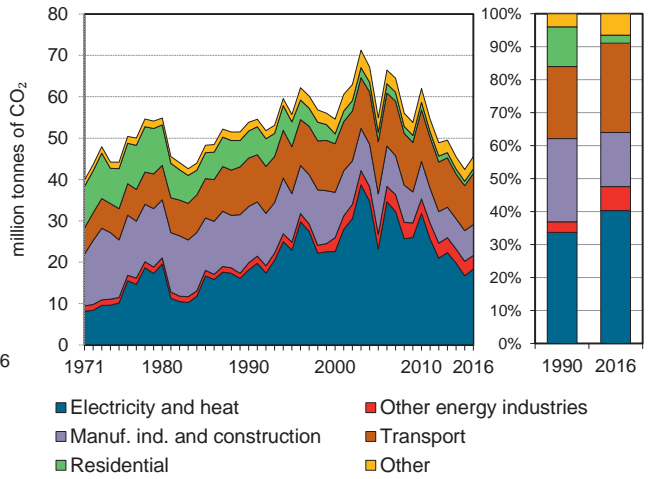


Figure 3. Electricity generation by fuel

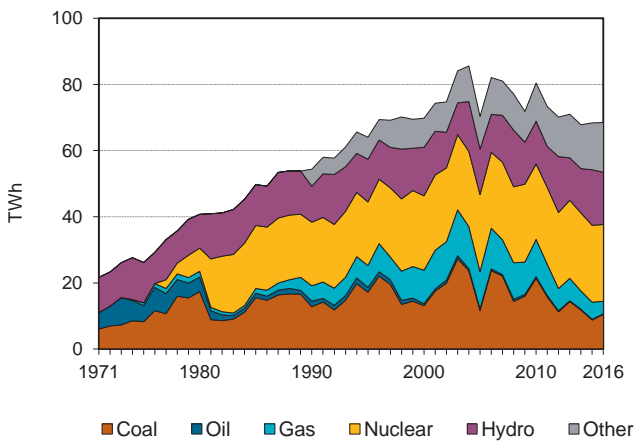


Figure 4. CO₂ from electricity generation: driving factors¹

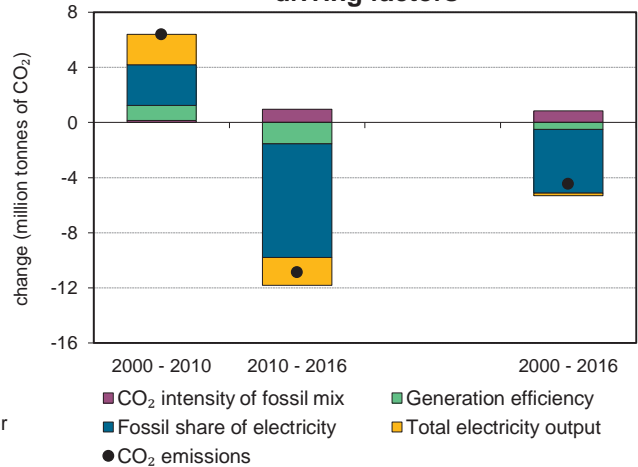


Figure 5. Changes in selected indicators

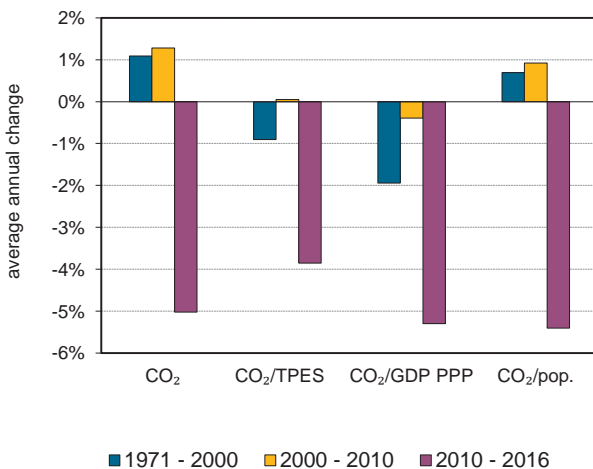
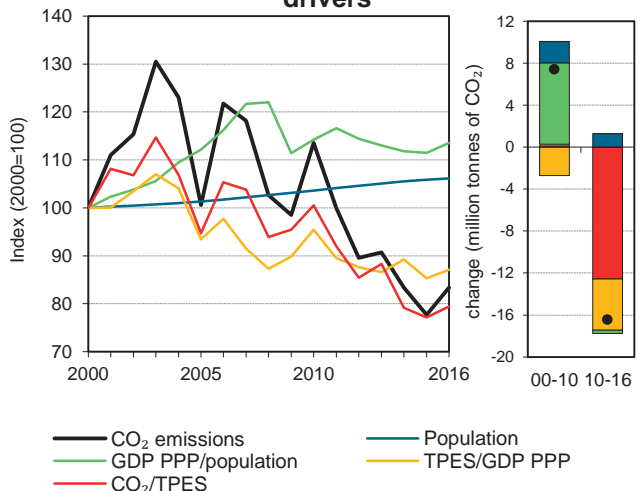


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Finland

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	53.8	55.7	54.6	54.9	62.0	42.4	45.5	-15%
Share of World CO ₂ from fuel combustion	0.3%	0.3%	0.2%	0.2%	0.2%	0.1%	0.1%	
TPES (PJ)	1188	1 211	1 356	1 440	1 532	1 366	1 424	20%
GDP (billion 2010 USD)	167.1	163.4	209.4	237.9	247.8	247.4	252.7	51%
GDP PPP (billion 2010 USD)	140.4	137.3	175.9	199.9	208.2	207.6	212.1	51%
Population (millions)	5	5.1	5.2	5.2	5.4	5.5	5.5	10%
CO ₂ / TPES (tCO ₂ per TJ)	45.3	46.0	40.3	38.1	40.5	31.1	32.0	-29%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.32	0.3	0.3	0.2	0.3	0.2	0.2	-44%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.38	0.4	0.3	0.3	0.3	0.2	0.2	-44%
CO ₂ / population (tCO ₂ per capita)	10.8	10.9	10.5	10.5	11.6	7.7	8.3	-23%
Share of electricity output from fossil fuels	35%	40%	34%	33%	41%	21%	22%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	193	227	178	168	234	107	117	-39%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	103	101	102	115	79	85	-15%
Population index	100	102	104	105	108	110	110	10%
GDP PPP per population index	100	95	121	135	138	135	137	37%
Energy intensity index - TPES / GDP PPP	100	104	91	85	87	78	79	-21%
Carbon intensity index - CO ₂ / TPES	100	102	89	84	89	69	71	-29%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	18.0	22.3	4.1	1.1	45.5	-15%
Electricity and heat generation	14.0	0.9	2.5	0.9	18.3	1%
Other energy industry own use	1.5	1.6	0.2	-	3.3	92%
Manufacturing industries and construction	2.3	3.7	1.2	0.2	7.5	-45%
Transport	-	12.3	0.0	-	12.4	5%
<i>of which: road</i>	-	11.7	0.0	-	11.7	9%
Other	0.2	3.7	0.1	-	4.1	-53%
<i>of which: residential</i>	0.0	1.0	0.1	-	1.1	-83%
<i>of which: services</i>	0.0	0.8	0.1	-	0.9	x
<i>Memo: international marine bunkers</i>	-	0.9	-	-	0.9	-49%
<i>Memo: international aviation bunkers</i>	-	1.9	-	-	1.9	94%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	13.7	12.6	22.7	22.7
Road - oil	11.7	10.8	19.4	42.1
Manufacturing industries - oil	3.7	3.9	6.2	48.3
Non-specified other - oil	2.7	2.1	4.4	52.7
Main activity prod. elec. and heat - gas	2.4	2.0	3.9	56.6
Manufacturing industries - coal	2.3	7.5	3.8	60.4
Other energy industry own use - oil	1.6	1.2	2.6	63.0
Other energy industry - coal	1.5	-	2.5	65.5
Manufacturing industries - gas	1.2	2.2	2.1	67.5
<i>Memo: total CO₂ from fuel combustion</i>	<i>45.5</i>	<i>53.8</i>	<i>75.5</i>	<i>75.5</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Former Yugoslav Republic of Macedonia

Figure 1. CO₂ emissions by fuel

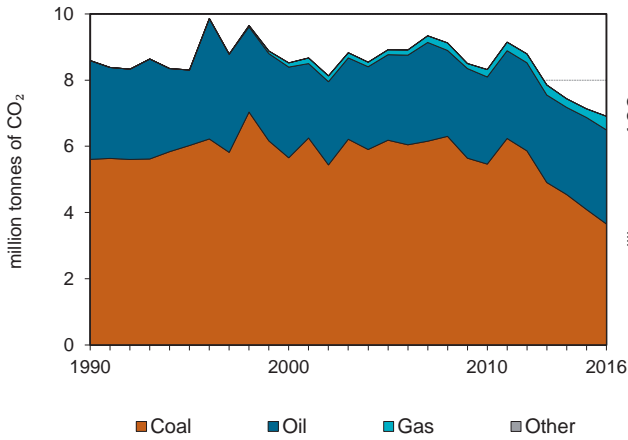


Figure 2. CO₂ emissions by sector

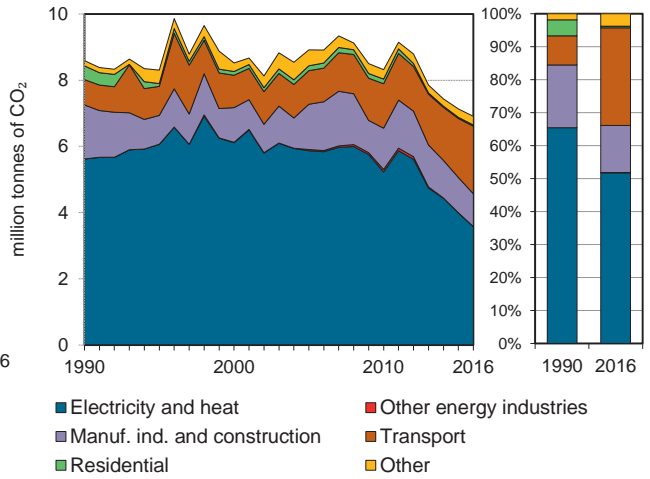


Figure 3. Electricity generation by fuel

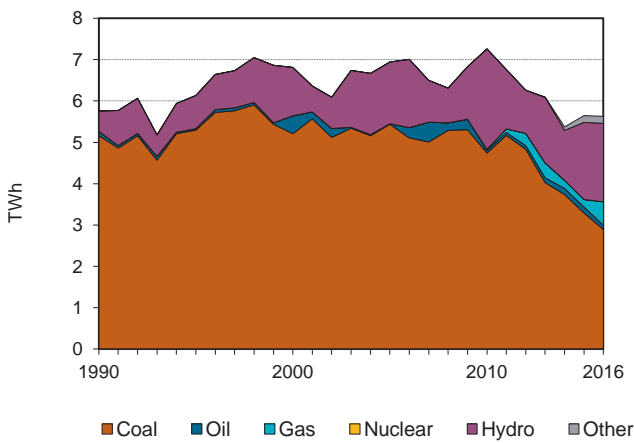


Figure 4. CO₂ from electricity generation: driving factors¹

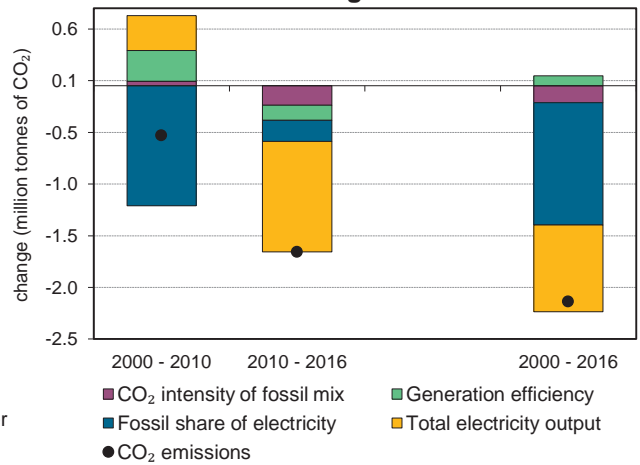


Figure 5. Changes in selected indicators

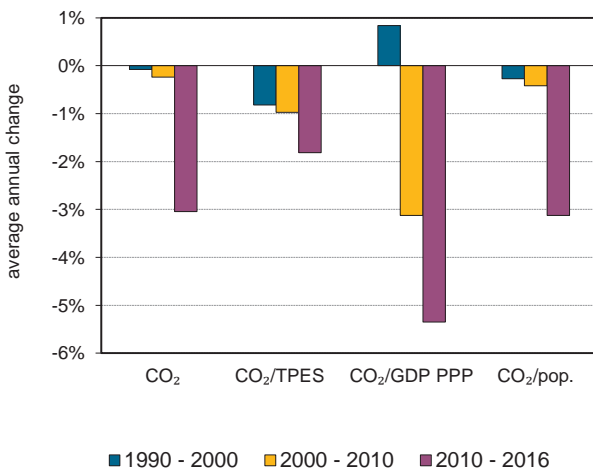
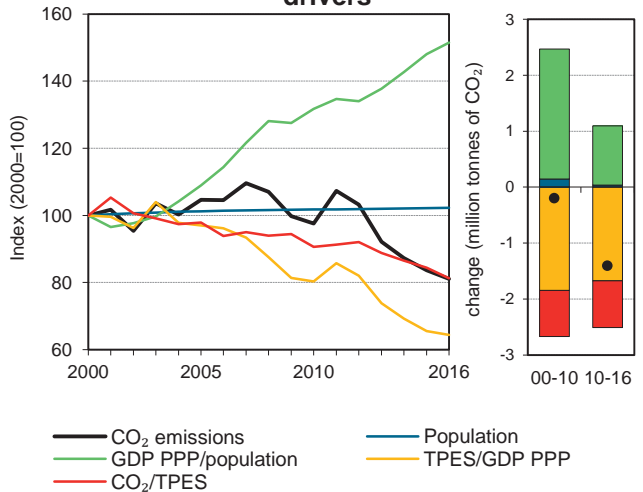


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Former Yugoslav Republic of Macedonia

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	8.6	8.3	8.5	8.9	8.3	7.1	6.9	-20%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	104	105	112	119	120	111	111	7%
GDP (billion 2010 USD)	7.7	6.1	7.0	7.7	9.4	10.6	10.9	41%
GDP PPP (billion 2010 USD)	19.1	15.1	17.4	19.2	23.4	26.4	27.0	41%
Population (millions)	2	2.0	2.0	2.1	2.1	2.1	2.1	4%
CO ₂ / TPES (tCO ₂ per TJ)	82.8	79.4	76.3	74.7	69.2	64.4	62.0	-25%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.12	1.4	1.2	1.2	0.9	0.7	0.6	-43%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.45	0.6	0.5	0.5	0.4	0.3	0.3	-43%
CO ₂ / population (tCO ₂ per capita)	4.3	4.2	4.2	4.3	4.0	3.4	3.3	-23%
Share of electricity output from fossil fuels	92%	87%	83%	79%	67%	64%	63%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	934	895	813	805	696	683	611	-35%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	97	99	104	97	83	80	-20%
Population index	100	99	102	103	104	104	104	4%
GDP PPP per population index	100	79	89	97	118	132	136	36%
Energy intensity index - TPES / GDP PPP	100	128	118	115	95	77	76	-24%
Carbon intensity index - CO ₂ / TPES	100	96	92	90	84	78	75	-25%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	3.7	2.8	0.4	-	6.9	-20%
Electricity and heat generation	3.2	0.1	0.3	-	3.6	-36%
Other energy industry own use	-	0.0	-	-	0.0	x
Manufacturing industries and construction	0.5	0.4	0.1	-	1.0	-39%
Transport	-	2.0	0.0	-	2.0	167%
<i>of which: road</i>	-	2.0	0.0	-	2.0	174%
Other	0.0	0.3	0.0	-	0.3	-48%
<i>of which: residential</i>	0.0	0.0	0.0	-	0.0	-91%
<i>of which: services</i>	0.0	0.2	0.0	-	0.2	+
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.0	-	-	0.0	200%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	3.2	5.1	30.3	30.3
Road - oil	2.0	0.7	19.5	49.9
Manufacturing industries - coal	0.5	0.4	4.6	54.5
Manufacturing industries - oil	0.4	1.2	4.2	58.6
Main activity prod. elec. and heat - gas	0.3	-	3.1	61.7
Non-specified other - oil	0.2	0.1	2.3	64.1
Main activity prod. elec. and heat - oil	0.1	0.2	0.8	64.9
Manufacturing industries - gas	0.1	-	0.7	65.6
Residential - oil	0.0	0.4	0.3	65.9
<i>Memo: total CO₂ from fuel combustion</i>	6.9	8.6	66.3	66.3

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

France

Figure 1. CO₂ emissions by fuel

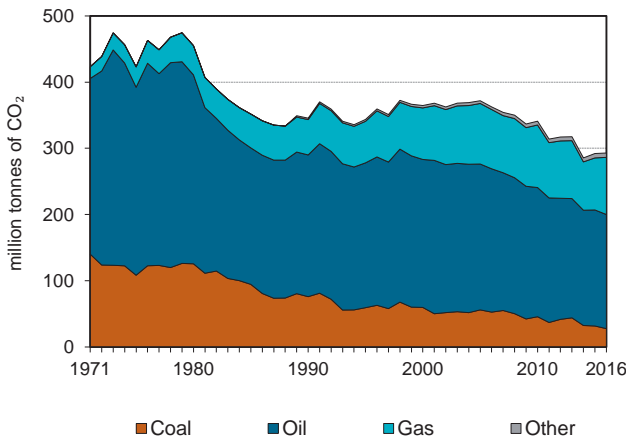


Figure 2. CO₂ emissions by sector

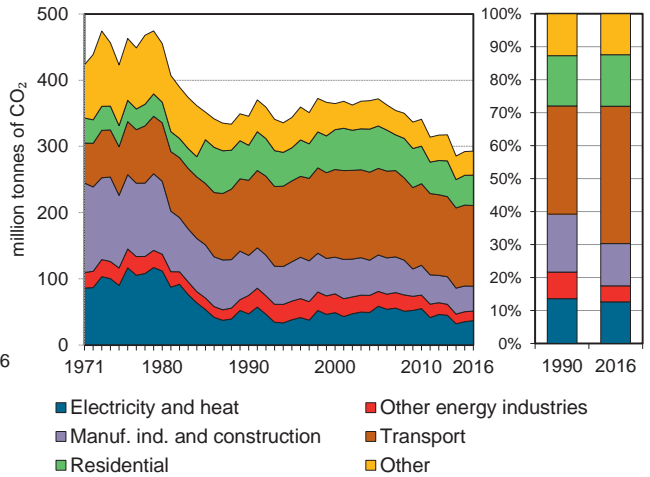


Figure 3. Electricity generation by fuel

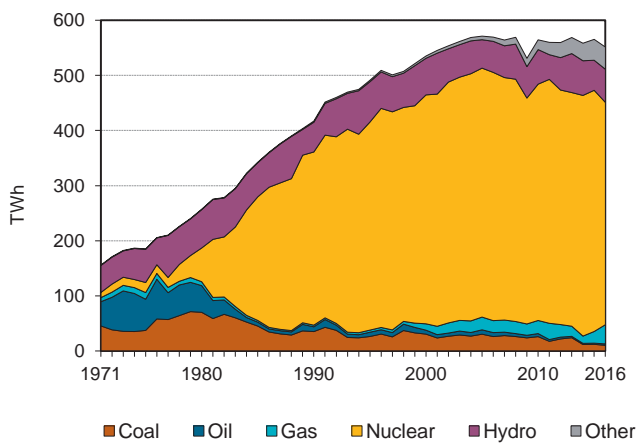


Figure 4. CO₂ from electricity generation: driving factors¹

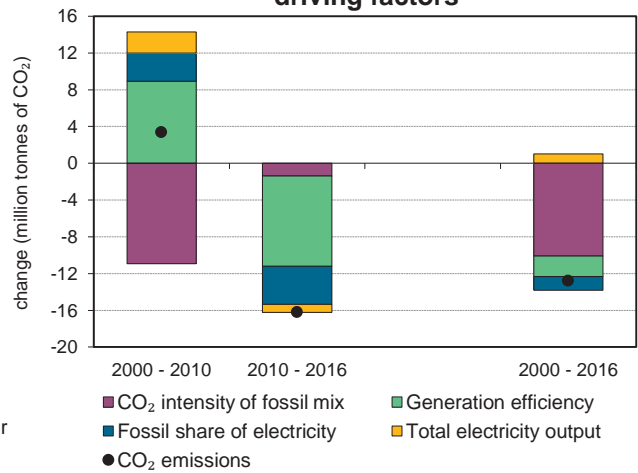


Figure 5. Changes in selected indicators

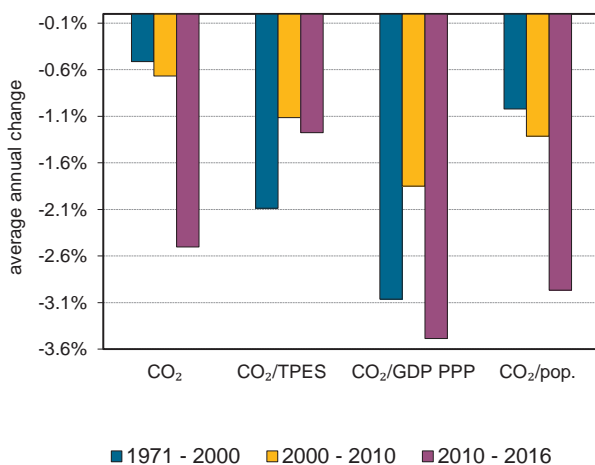
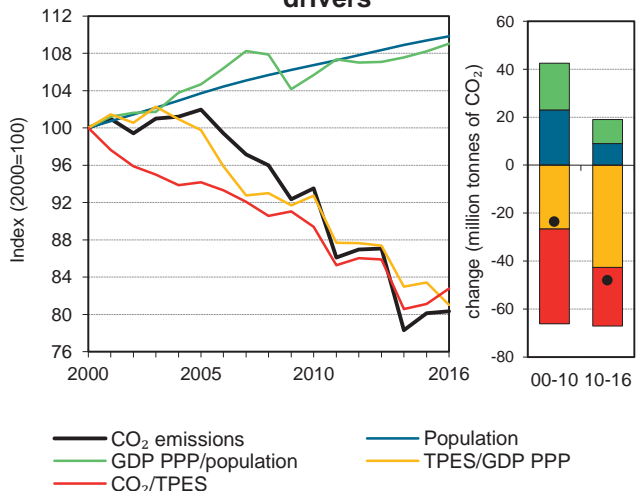


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

France

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	345.6	343.6	364.7	371.9	341.0	292.2	292.9	-15%
Share of World CO ₂ from fuel combustion	1.7%	1.6%	1.6%	1.4%	1.1%	0.9%	0.9%	
TPES (PJ)	9372	9 918	10 540	11 416	11 024	10 408	10 227	9%
GDP (billion 2010 USD)	1907.3	2 033.1	2 346.5	2 547.2	2 646.8	2 777.5	2 810.5	47%
GDP PPP (billion 2010 USD)	1688.2	1 799.5	2 076.9	2 254.5	2 342.7	2 458.4	2 487.6	47%
Population (millions)	58.2	59.5	60.9	63.1	65.0	66.6	66.9	15%
CO ₂ / TPES (tCO ₂ per TJ)	36.9	34.7	34.6	32.6	30.9	28.1	28.6	-22%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.18	0.2	0.2	0.1	0.1	0.1	0.1	-43%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.21	0.2	0.2	0.2	0.1	0.1	0.1	-42%
CO ₂ / population (tCO ₂ per capita)	5.9	5.8	6.0	5.9	5.2	4.4	4.4	-26%
Share of electricity output from fossil fuels	11%	8%	10%	11%	10%	7%	9%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	108	74	77	81	80	49	52	-52%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	99	106	108	99	85	85	-15%
Population index	100	102	105	108	112	114	115	15%
GDP PPP per population index	100	104	118	123	124	127	128	28%
Energy intensity index - TPES / GDP PPP	100	99	91	91	85	76	74	-26%
Carbon intensity index - CO ₂ / TPES	100	94	94	88	84	76	78	-22%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	27.6	172.4	86.3	6.6	292.9	-15%
Electricity and heat generation	13.2	2.3	15.4	5.9	36.8	-22%
Other energy industry own use	6.8	4.8	2.7	0.1	14.4	-48%
Manufacturing industries and construction	7.3	7.2	23.1	0.0	37.6	-38%
Transport	-	121.8	0.2	-	121.9	7%
<i>of which: road</i>	-	117.6	0.1	-	117.7	8%
Other	0.3	36.3	45.1	0.5	82.2	-15%
<i>of which: residential</i>	0.2	17.4	28.3	-	45.9	-13%
<i>of which: services</i>	0.2	6.9	16.2	0.5	23.8	-28%
<i>Memo: international marine bunkers</i>	-	4.7	-	-	4.7	-40%
<i>Memo: international aviation bunkers</i>	-	17.5	-	-	17.5	86%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	117.6	108.8	27.1	27.1
Residential - gas ***	28.3	15.5	6.5	33.6
Manufacturing industries - gas	23.1	21.6	5.3	38.9
Non-specified other - oil	18.9	26.5	4.4	43.3
Residential - oil	17.4	33.4	4.0	47.3
Non-specified other - gas	16.7	14.7	3.9	51.1
Main activity prod. elec. and heat - gas ***	13.7	0.1	3.2	54.3
Main activity prod. elec. and heat - coal	11.3	21.6	2.6	56.9
Manufacturing industries - coal	7.3	17.8	1.7	58.6
<i>Memo: total CO₂ from fuel combustion</i>	<i>292.9</i>	<i>345.6</i>	<i>67.4</i>	<i>67.4</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Gabon

Figure 1. CO₂ emissions by fuel

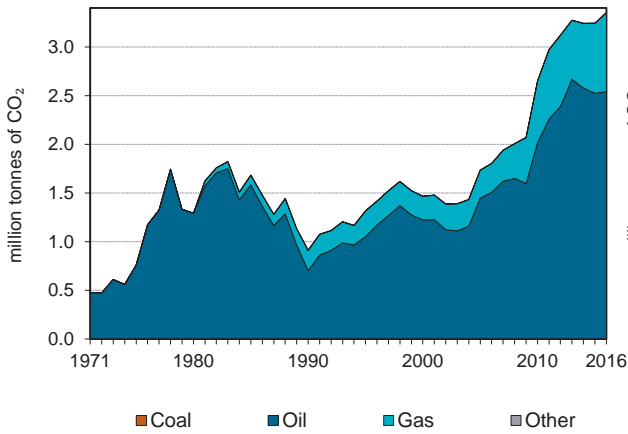


Figure 2. CO₂ emissions by sector

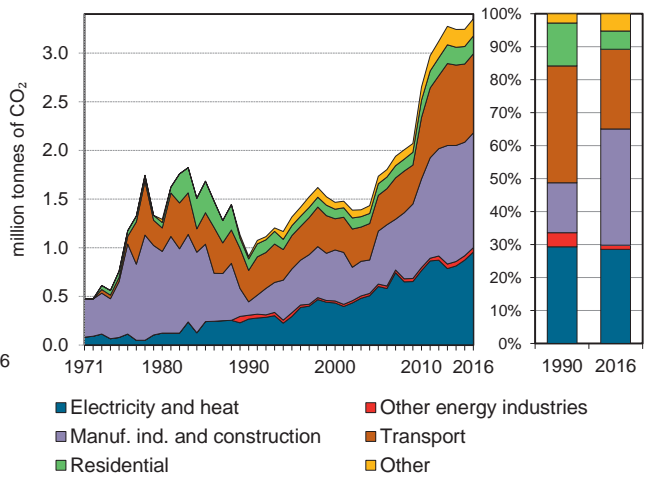


Figure 3. Electricity generation by fuel

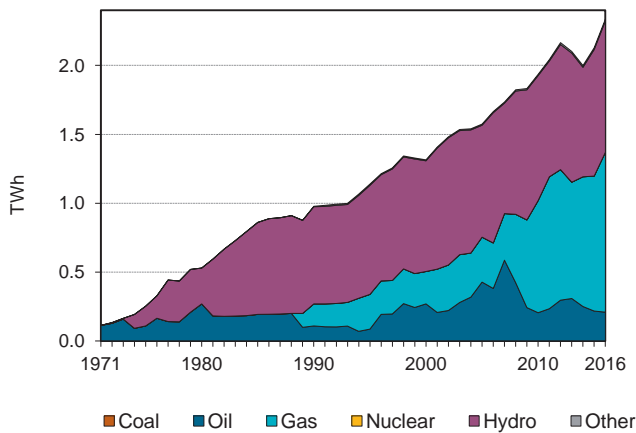


Figure 4. CO₂ from electricity generation: driving factors¹

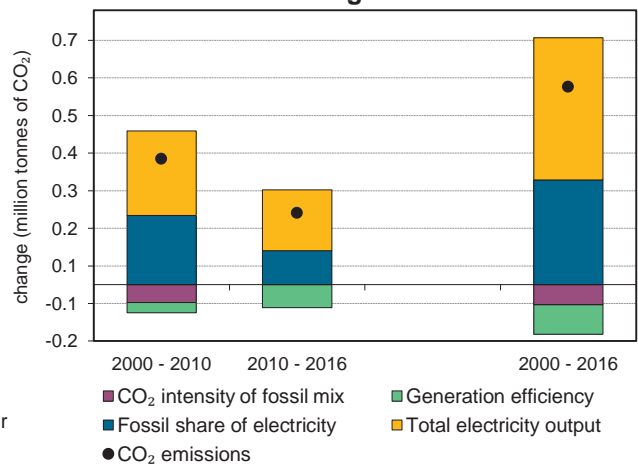


Figure 5. Changes in selected indicators

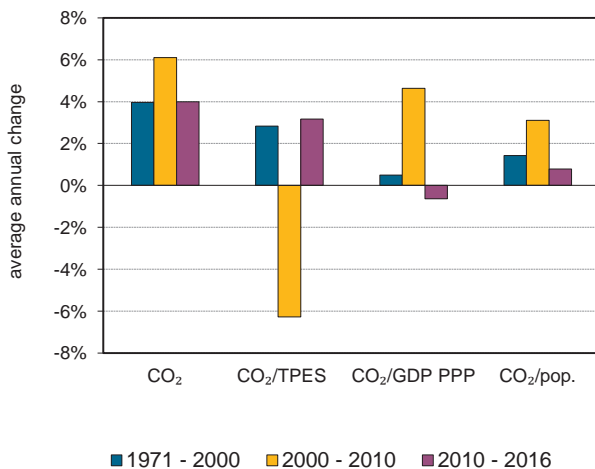
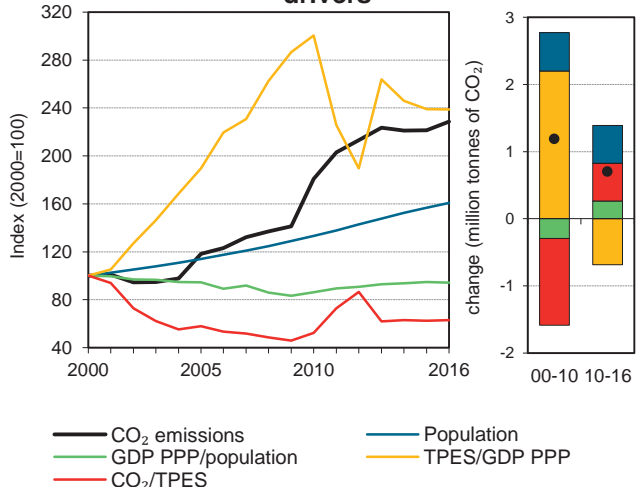


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Gabon

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	0.9	1.3	1.5	1.7	2.7	3.2	3.4	268%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	49	56	62	126	213	219	223	351%
GDP (billion 2010 USD)	10.6	12.3	12.5	13.6	14.4	18.5	18.9	79%
GDP PPP (billion 2010 USD)	18.2	21.2	21.5	23.1	24.7	31.8	32.6	79%
Population (millions)	1	1.1	1.2	1.4	1.6	1.9	2.0	108%
CO ₂ / TPES (tCO ₂ per TJ)	18.4	23.4	23.8	13.8	12.5	14.8	15.0	-18%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.09	0.1	0.1	0.1	0.2	0.2	0.2	106%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.05	0.1	0.1	0.1	0.1	0.1	0.1	106%
CO ₂ / population (tCO ₂ per capita)	1	1.2	1.2	1.2	1.6	1.7	1.7	77%
Share of electricity output from fossil fuels	28%	30%	38%	48%	53%	56%	59%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	272	257	328	382	395	410	409	50%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	145	161	190	291	356	368	268%
Population index	100	114	129	147	172	203	208	108%
GDP PPP per population index	100	102	91	86	79	86	86	-14%
Energy intensity index - TPES / GDP PPP	100	98	106	200	317	252	252	152%
Carbon intensity index - CO ₂ / TPES	100	127	129	75	68	81	82	-18%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	2.5	0.8	-	3.4	268%
Electricity and heat generation	-	0.2	0.8	-	1.0	258%
Other energy industry own use	-	-	0.0	-	0.0	15%
Manufacturing industries and construction	-	1.2	0.0	-	1.2	756%
Transport	-	0.8	-	-	0.8	152%
<i>of which: road</i>	-	0.8	-	-	0.8	152%
Other	-	0.4	-	-	0.4	150%
<i>of which: residential</i>	-	0.2	-	-	0.2	55%
<i>of which: services</i>	-	0.1	-	-	0.1	x
<i>Memo: international marine bunkers</i>	-	0.6	-	-	0.6	615%
<i>Memo: international aviation bunkers</i>	-	0.2	-	-	0.2	5%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Manufacturing industries - oil	1.2	0.1	7.5	7.5
Road - oil	0.8	0.3	5.2	12.7
Main activity prod. elec. and heat - gas	0.7	0.1	4.2	16.9
Residential - oil	0.2	0.1	1.2	18.0
Non-specified other - oil	0.2	0.0	1.1	19.2
Main activity prod. elec. and heat - oil	0.1	0.1	0.8	19.9
Unallocated autoproducers - gas	0.1	0.0	0.7	20.6
Unallocated autoproducers - oil	0.1	0.0	0.5	21.1
Other energy industry own use - gas	0.0	0.0	0.3	21.4
<i>Memo: total CO₂ from fuel combustion</i>	3.4	0.9	21.4	21.4

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Georgia

Figure 1. CO₂ emissions by fuel

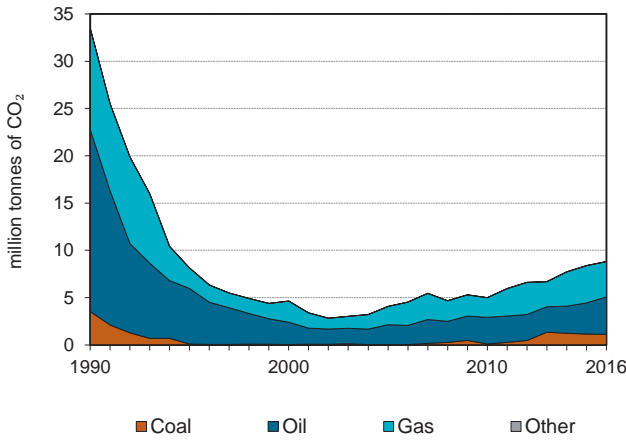


Figure 2. CO₂ emissions by sector

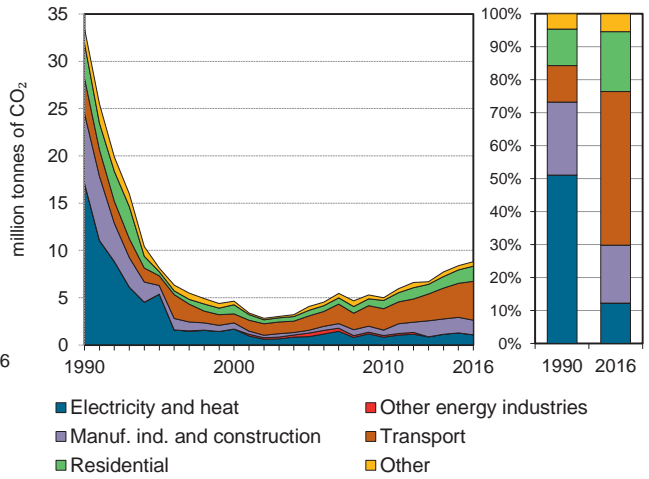


Figure 3. Electricity generation by fuel

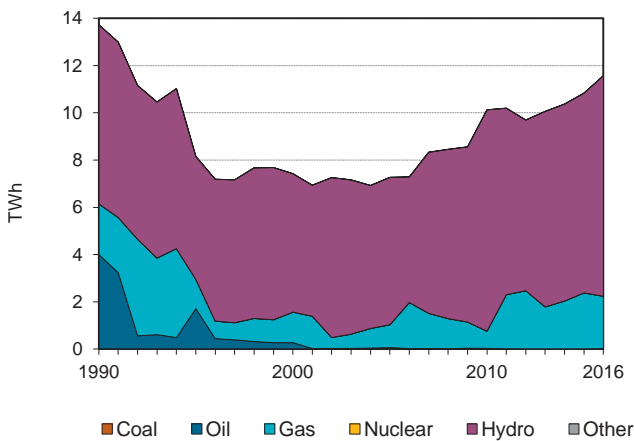


Figure 4. CO₂ from electricity generation: driving factors¹

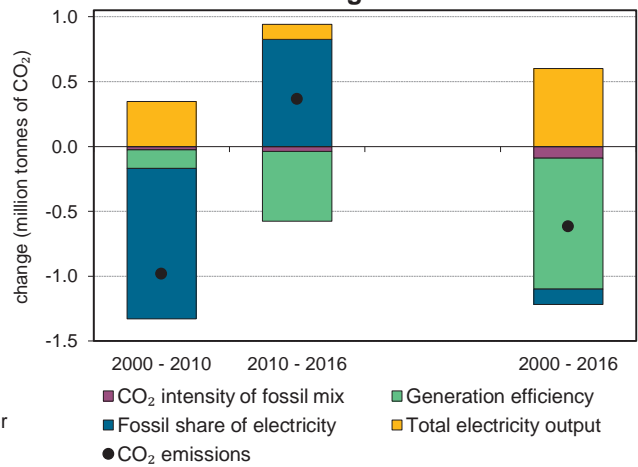


Figure 5. Changes in selected indicators

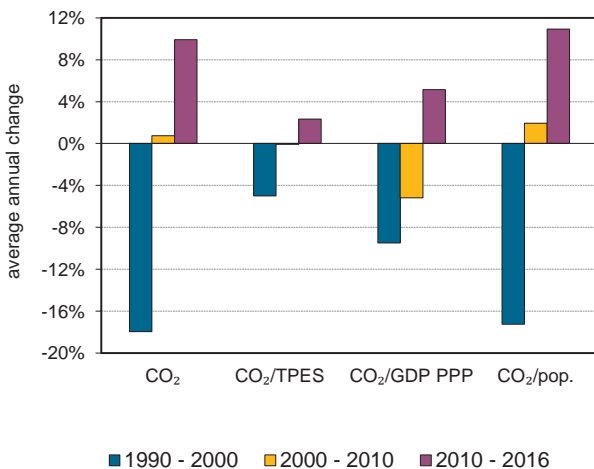
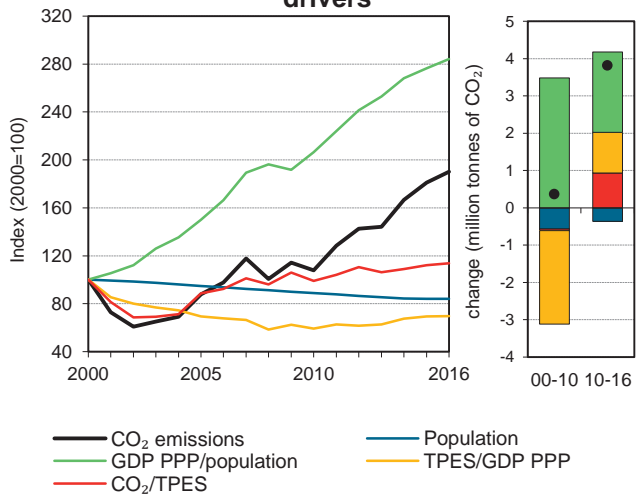


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Georgia

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	33.5	8.1	4.6	4.1	5.0	8.4	8.8	-74%
Share of World CO ₂ from fuel combustion	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	520	156	120	119	131	194	201	-61%
GDP (billion 2010 USD)	16.9	4.8	6.3	9.0	11.6	14.8	15.2	-10%
GDP PPP (billion 2010 USD)	37.7	10.6	14.1	20.1	25.9	32.9	33.8	-10%
Population (millions)	4.8	4.7	4.4	4.2	3.9	3.7	3.7	-23%
CO ₂ / TPES (tCO ₂ per TJ)	64.4	52.2	38.6	34.2	38.2	43.2	43.9	-32%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.98	1.7	0.7	0.5	0.4	0.6	0.6	-71%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.89	0.8	0.3	0.2	0.2	0.3	0.3	-71%
CO ₂ / population (tCO ₂ per capita)	7	1.7	1.0	1.0	1.3	2.3	2.4	-66%
Share of electricity output from fossil fuels	45%	36%	21%	14%	8%	22%	19%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	580	514	227	101	69	118	92	-84%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	24	14	12	15	25	26	-74%
Population index	100	99	92	87	82	77	77	-23%
GDP PPP per population index	100	29	41	61	84	113	116	16%
Energy intensity index - TPES / GDP PPP	100	106	62	43	37	43	43	-57%
Carbon intensity index - CO ₂ / TPES	100	81	60	53	59	67	68	-32%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	1.1	4.0	3.7	-	8.8	-74%
Electricity and heat generation	0.0	-	1.0	-	1.1	-94%
Other energy industry own use	0.0	0.0	-	-	0.0	x
Manufacturing industries and construction	1.1	0.3	0.2	-	1.5	-79%
Transport	-	3.6	0.5	-	4.1	11%
<i>of which: road</i>	-	3.5	0.5	-	4.1	16%
Other	0.0	0.1	1.9	-	2.1	-61%
<i>of which: residential</i>	0.0	0.0	1.5	-	1.6	-57%
<i>of which: services</i>	0.0	0.0	0.4	-	0.4	-61%
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.2	-	-	0.2	-64%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	3.5	3.5	22.8	22.8
Residential - gas	1.5	2.6	10.0	32.9
Manufacturing industries - coal	1.1	2.3	6.8	39.7
Main activity prod. elec. and heat - gas	1.0	4.6	6.6	46.4
Road - gas	0.5	-	3.5	49.9
Non-specified other - gas	0.4	0.3	2.6	52.4
Manufacturing industries - oil	0.3	2.0	1.7	54.1
Manufacturing industries - gas	0.2	3.1	1.5	55.6
Non-specified other - oil	0.1	1.1	0.5	56.1
<i>Memo: total CO₂ from fuel combustion</i>	8.8	33.5	57.1	57.1

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Germany

Figure 1. CO₂ emissions by fuel

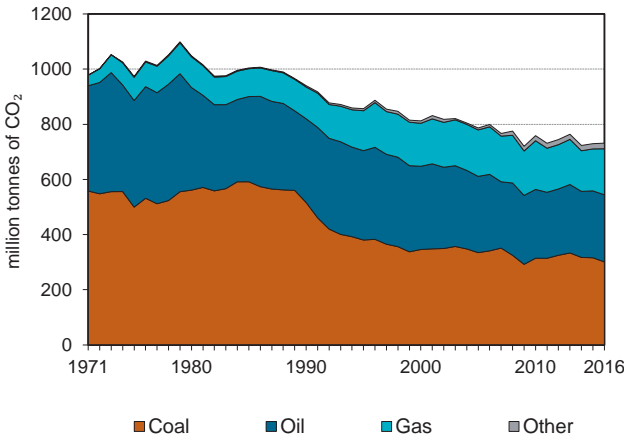


Figure 2. CO₂ emissions by sector

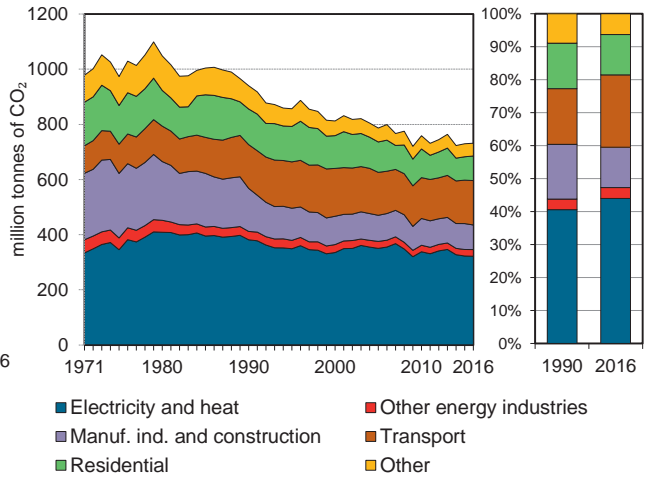


Figure 3. Electricity generation by fuel

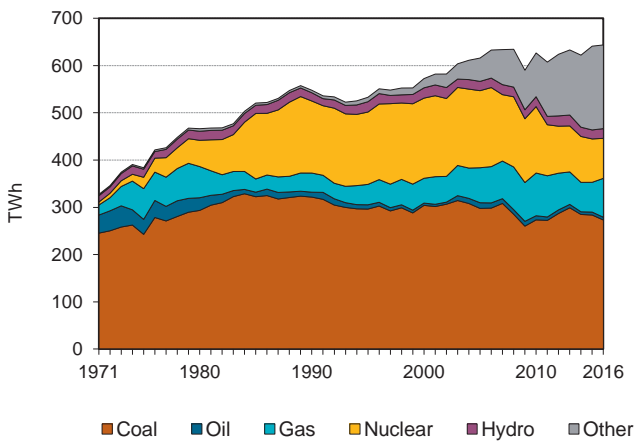


Figure 4. CO₂ from electricity generation: driving factors¹

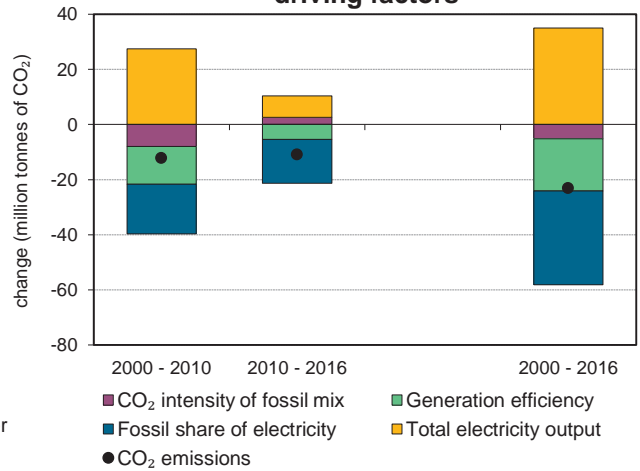


Figure 5. Changes in selected indicators

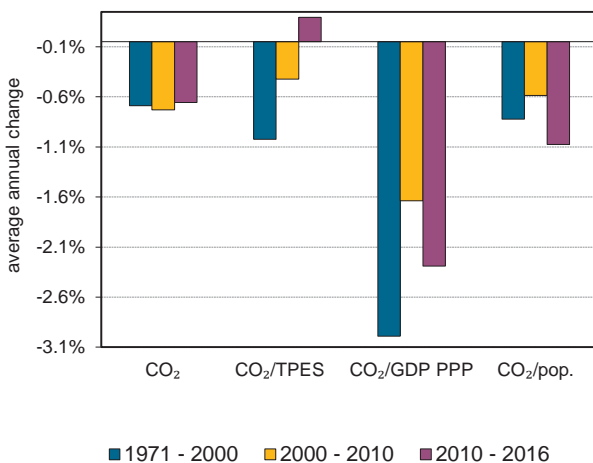
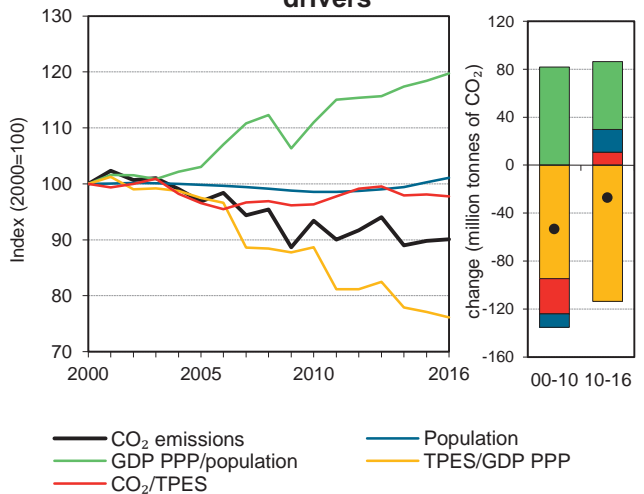


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Germany

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	940	856.6	812.3	786.7	758.8	729.7	731.6	-22%
Share of World CO ₂ from fuel combustion	4.6%	4.0%	3.5%	2.9%	2.5%	2.3%	2.3%	
TPES (PJ)	14705	14 089	14 093	14 134	13 664	12 903	12 984	-12%
GDP (billion 2010 USD)	2568.6	2 841.0	3 123.9	3 213.8	3 417.1	3 709.6	3 781.7	47%
GDP PPP (billion 2010 USD)	2413.6	2 669.5	2 935.3	3 019.8	3 210.8	3 485.7	3 553.4	47%
Population (millions)	79.4	81.3	81.5	81.3	80.3	81.7	82.3	4%
CO ₂ / TPES (tCO ₂ per TJ)	63.9	60.8	57.6	55.7	55.5	56.6	56.3	-12%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.37	0.3	0.3	0.2	0.2	0.2	0.2	-47%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.39	0.3	0.3	0.3	0.2	0.2	0.2	-47%
CO ₂ / population (tCO ₂ per capita)	11.8	10.5	10.0	9.7	9.5	8.9	8.9	-25%
Share of electricity output from fossil fuels	69%	66%	64%	63%	61%	56%	57%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	624	600	542	506	475	450	447	-28%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	91	86	84	81	78	78	-22%
Population index	100	102	103	102	101	103	104	4%
GDP PPP per population index	100	108	118	122	132	140	142	42%
Energy intensity index - TPES / GDP PPP	100	87	79	77	70	61	60	-40%
Carbon intensity index - CO ₂ / TPES	100	95	90	87	87	88	88	-12%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	301.0	243.3	167.0	20.4	731.6	-22%
Electricity and heat generation	262.5	4.1	40.9	14.3	321.8	-16%
Other energy industry own use	6.0	15.1	3.0	0.1	24.1	-20%
Manufacturing industries and construction	30.2	7.2	45.8	6.0	89.2	-43%
Transport	-	160.0	1.0	-	161.0	2%
<i>of which: road</i>	-	155.4	0.4	-	155.8	4%
Other	2.2	57.0	76.3	-	135.5	-37%
<i>of which: residential</i>	2.1	35.1	51.9	-	89.1	-31%
<i>of which: services</i>	0.1	21.5	24.4	-	46.0	-32%
<i>Memo: international marine bunkers</i>	-	8.9	-	-	8.9	12%
<i>Memo: international aviation bunkers</i>	-	25.9	-	-	25.9	95%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	235.6	287.7	26.8	26.8
Road - oil	155.4	150.2	17.7	44.5
Residential - gas	51.9	31.5	5.9	50.4
Manufacturing industries - gas	45.8	40.0	5.2	55.6
Residential - oil	35.1	55.8	4.0	59.6
Main activity prod. elec. and heat - gas	31.6	18.6	3.6	63.2
Manufacturing industries - coal	30.2	93.6	3.4	66.6
Unallocated autoproducers - coal	26.9	53.5	3.1	69.7
Non-specified other - gas	24.4	14.9	2.8	72.5
<i>Memo: total CO₂ from fuel combustion</i>	<i>731.6</i>	<i>940</i>	<i>83.2</i>	<i>83.2</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Ghana

Figure 1. CO₂ emissions by fuel

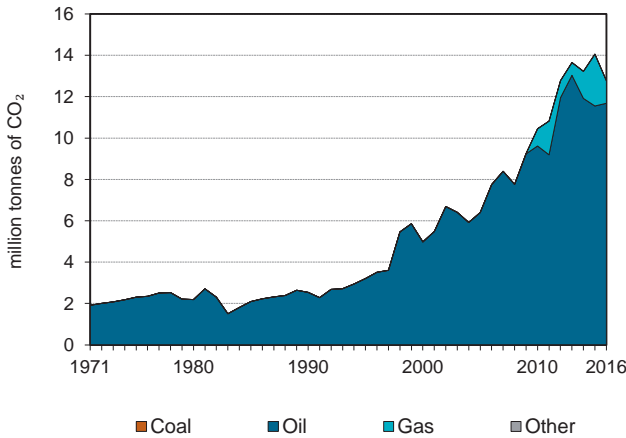


Figure 2. CO₂ emissions by sector

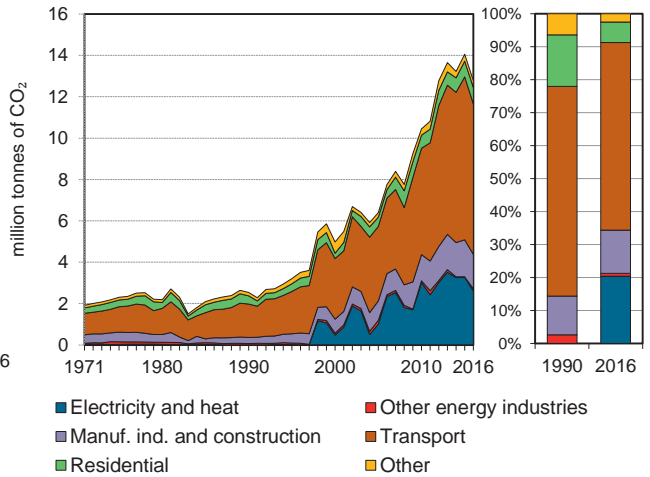


Figure 3. Electricity generation by fuel

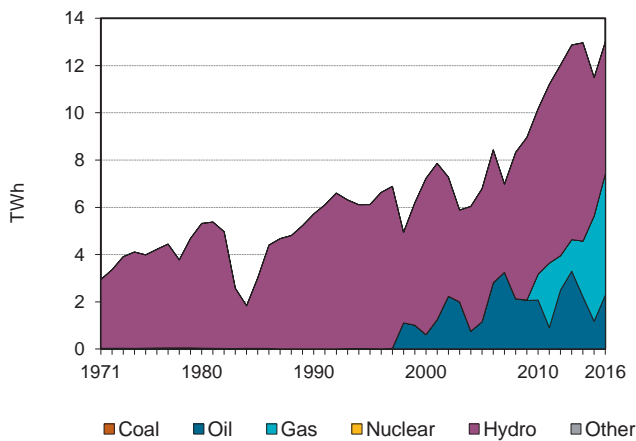


Figure 4. CO₂ from electricity generation: driving factors¹

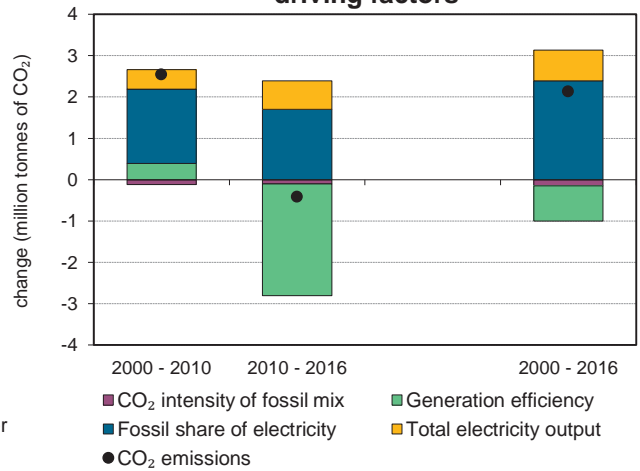


Figure 5. Changes in selected indicators

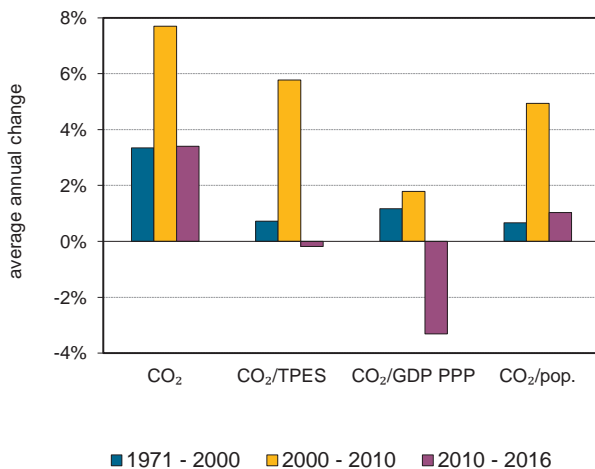
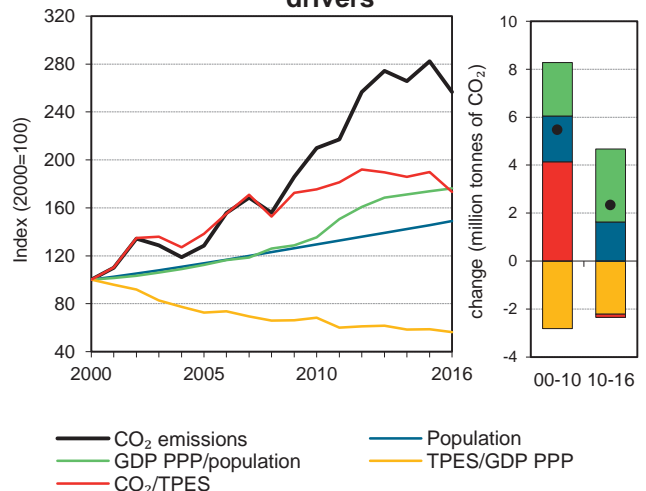


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Ghana

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	2.5	3.2	5.0	6.4	10.5	14.1	12.8	403%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	222	271	265	246	317	395	392	77%
GDP (billion 2010 USD)	12.1	14.9	18.4	23.5	32.2	46.5	48.2	300%
GDP PPP (billion 2010 USD)	27.5	33.9	41.9	53.6	73.5	106.2	110.0	300%
Population (millions)	14.6	16.8	18.9	21.5	24.5	27.6	28.2	93%
CO ₂ / TPES (tCO ₂ per TJ)	11.5	11.8	18.8	26.0	32.9	35.6	32.6	184%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.21	0.2	0.3	0.3	0.3	0.3	0.3	26%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.09	0.1	0.1	0.1	0.1	0.1	0.1	26%
CO ₂ / population (tCO ₂ per capita)	0.2	0.2	0.3	0.3	0.4	0.5	0.5	160%
Share of electricity output from fossil fuels	0%	0%	9%	17%	31%	49%	57%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	0	3	66	148	297	286	200	0%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	126	196	252	412	554	503	403%
Population index	100	115	129	147	168	189	193	93%
GDP PPP per population index	100	108	118	132	159	205	207	107%
Energy intensity index - TPES / GDP PPP	100	99	79	57	54	46	44	-56%
Carbon intensity index - CO ₂ / TPES	100	103	164	227	287	311	284	184%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	11.7	1.1	-	12.8	403%
Electricity and heat generation	-	1.5	1.1	-	2.6	x
Other energy industry own use	-	0.1	-	-	0.1	61%
Manufacturing industries and construction	-	1.7	-	-	1.7	463%
Transport	-	7.3	-	-	7.3	350%
<i>of which: road</i>	-	6.7	-	-	6.7	340%
Other	-	1.1	-	-	1.1	99%
<i>of which: residential</i>	-	0.8	-	-	0.8	100%
<i>of which: services</i>	-	0.1	-	-	0.1	148%
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.4	-	-	0.4	218%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	6.7	1.5	17.3	17.3
Manufacturing industries - oil	1.7	0.3	4.3	21.6
Main activity prod. elec. and heat - oil	1.5	-	3.9	25.5
Main activity prod. elec. and heat - gas	1.1	-	2.8	28.3
Residential - oil	0.8	0.4	2.0	30.3
Other transport - oil	0.5	0.1	1.4	31.7
Non-specified other - oil	0.3	0.2	0.8	32.5
Other energy industry own use - oil	0.1	0.1	0.3	32.8
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	12.8	2.5	32.8	32.8

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Gibraltar

Figure 1. CO₂ emissions by fuel

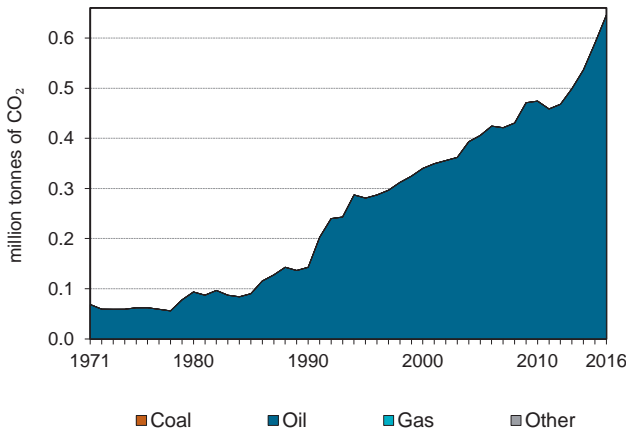


Figure 2. CO₂ emissions by sector

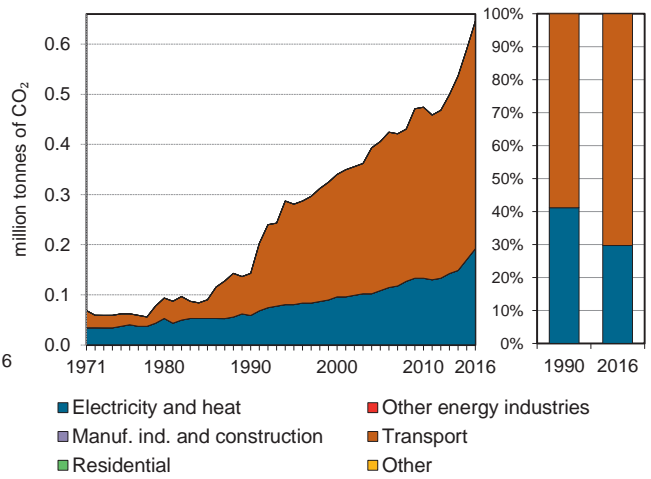


Figure 3. Electricity generation by fuel

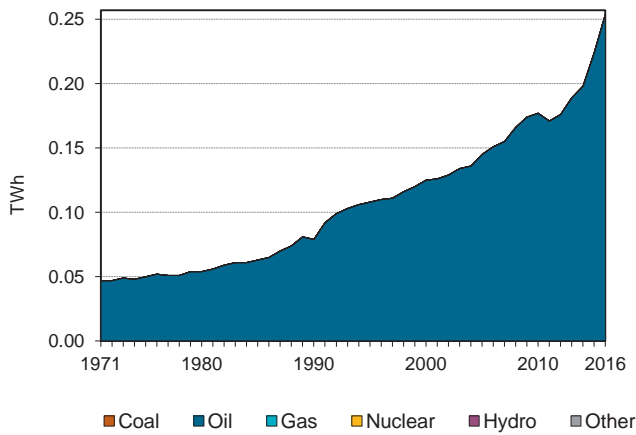


Figure 4. CO₂ from electricity generation: driving factors¹

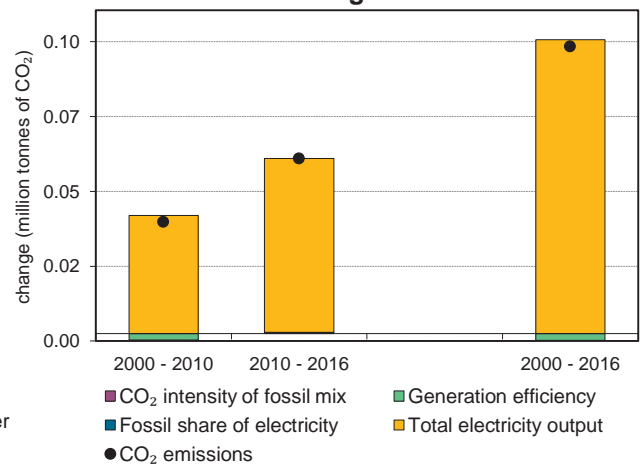


Figure 5. Changes in selected indicators

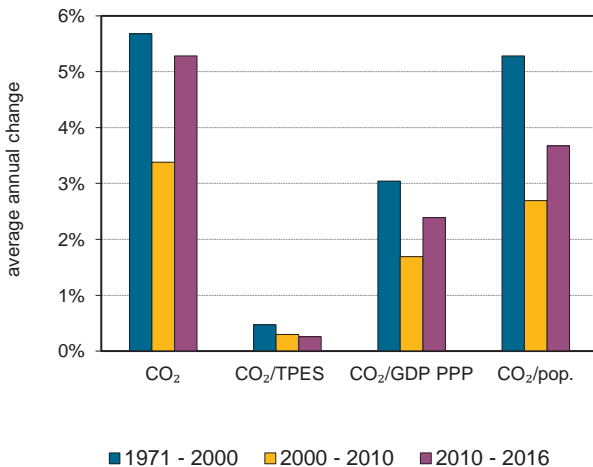
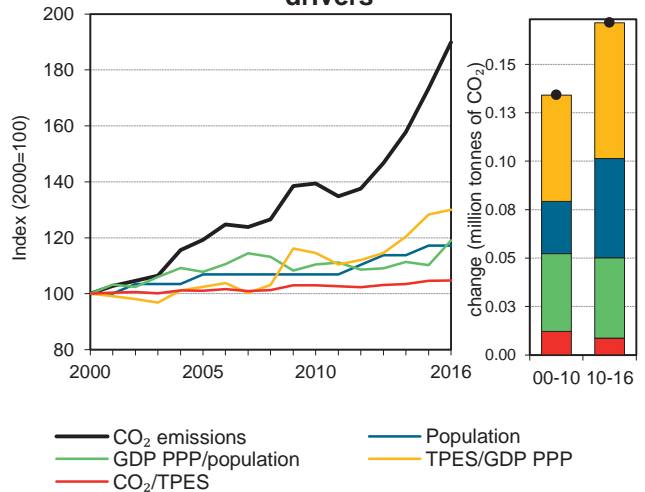


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Gibraltar

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	0.1	0.3	0.3	0.4	0.5	0.6	0.6	352%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	2	4	5	6	7	9	10	303%
GDP (billion 2010 USD)	0.7	0.8	0.9	1.0	1.1	1.2	1.3	76%
GDP PPP (billion 2010 USD)	0.6	0.6	0.8	0.9	0.9	1.0	1.1	86%
Population (millions)	0	0.0	0.0	0.0	0.0	0.0	0.0	21%
CO ₂ / TPES (tCO ₂ per TJ)	59.3	64.0	63.5	64.2	65.5	66.4	66.5	12%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.2	0.4	0.4	0.4	0.5	0.5	0.5	157%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.25	0.4	0.4	0.5	0.5	0.6	0.6	143%
CO ₂ / population (tCO ₂ per capita)	5.1	9.7	11.7	13.1	15.3	17.3	19.0	272%
Share of electricity output from fossil fuels	100%	100%	100%	100%	100%	100%	100%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	745	745	768	747	752	760	756	1%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	197	238	284	332	413	452	352%
Population index	100	104	104	111	111	121	121	21%
GDP PPP per population index	100	105	129	139	142	142	153	53%
Energy intensity index - TPES / GDP PPP	100	168	167	171	191	214	217	117%
Carbon intensity index - CO ₂ / TPES	100	108	107	108	110	112	112	12%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	0.6	-	-	0.6	352%
Electricity and heat generation	-	0.2	-	-	0.2	226%
Other energy industry own use	-	-	-	-	-	-
Manufacturing industries and construction	-	-	-	-	-	-
Transport	-	0.5	-	-	0.5	441%
<i>of which: road</i>	-	0.5	-	-	0.5	441%
Other	-	-	-	-	-	-
<i>of which: residential</i>	-	-	-	-	-	-
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	11.9	-	-	11.9	116%
<i>Memo: international aviation bunkers</i>	-	0.0	-	-	0.0	14%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	0.5	0.1	67.4	67.4
Main activity prod. elec. and heat - oil	0.2	0.1	28.5	96.0
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	<i>0.6</i>	<i>0.1</i>	<i>96.0</i>	<i>96.0</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Greece

Figure 1. CO₂ emissions by fuel

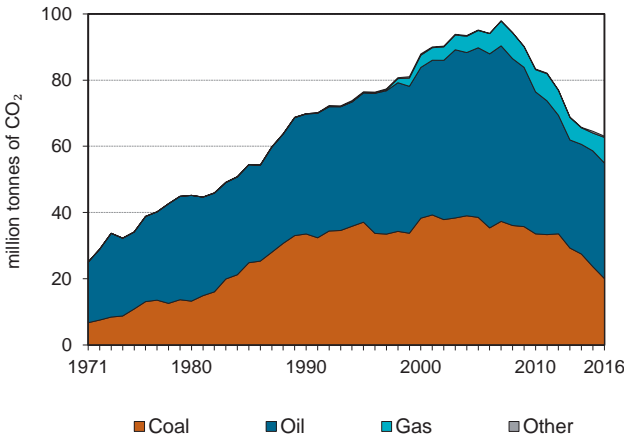


Figure 2. CO₂ emissions by sector

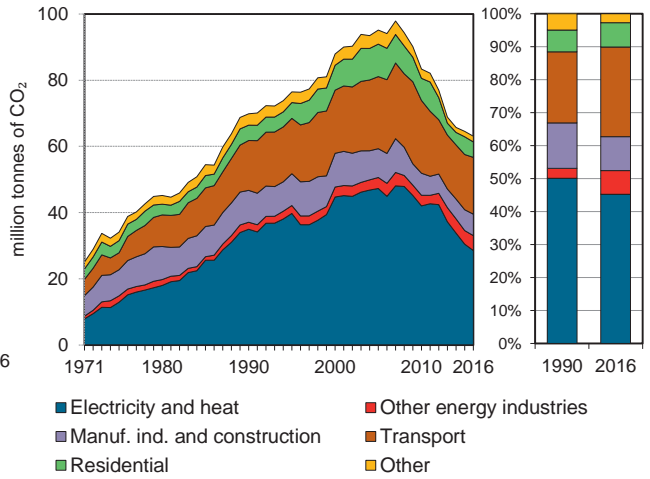


Figure 3. Electricity generation by fuel

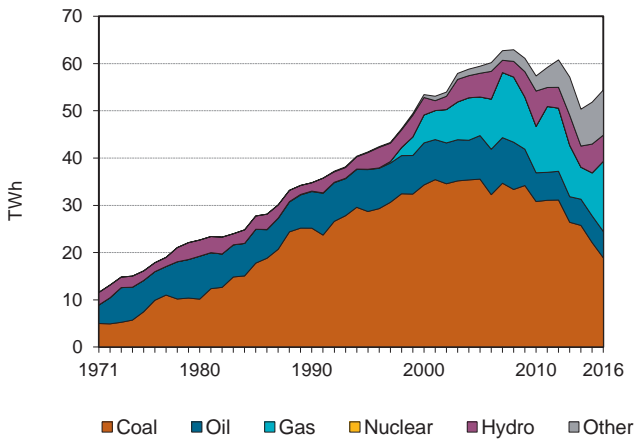


Figure 4. CO₂ from electricity generation: driving factors¹

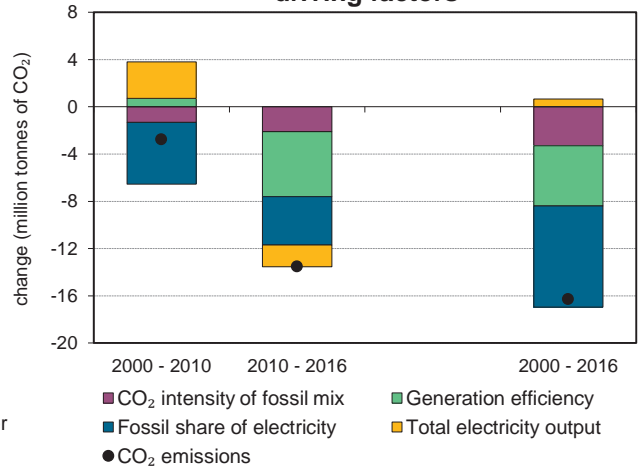


Figure 5. Changes in selected indicators

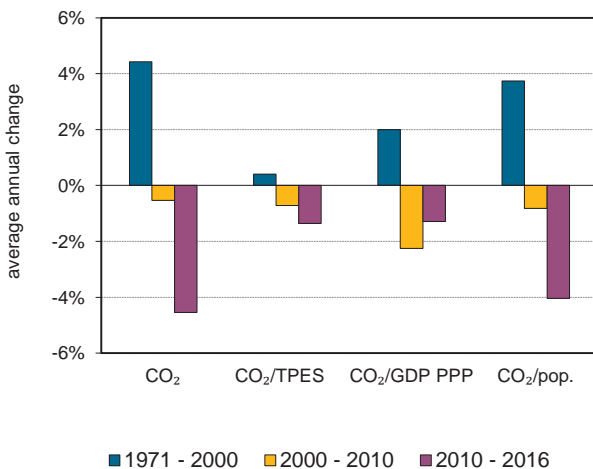
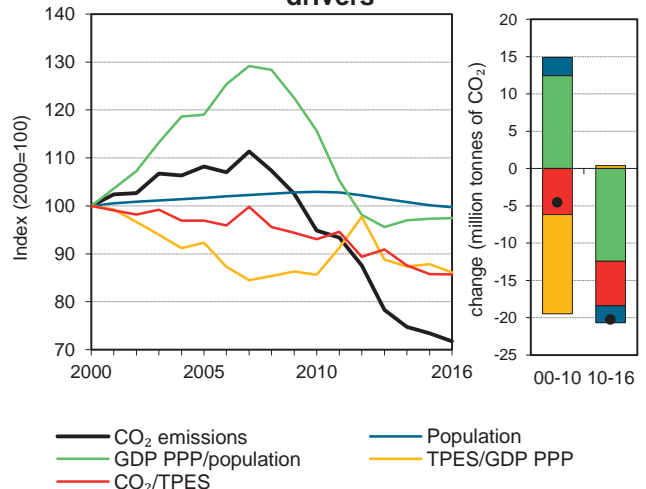


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Greece

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	69.9	76.5	87.9	95.2	83.4	64.5	63.1	-10%
Share of World CO ₂ from fuel combustion	0.3%	0.4%	0.4%	0.4%	0.3%	0.2%	0.2%	
TPES (PJ)	898	950	1 134	1 266	1 156	971	949	6%
GDP (billion 2010 USD)	197.7	210.3	251.5	304.3	299.4	245.1	244.5	24%
GDP PPP (billion 2010 USD)	207.1	220.3	263.5	318.9	313.7	256.8	256.2	24%
Population (millions)	10.3	10.6	10.8	11.0	11.1	10.8	10.8	5%
CO ₂ / TPES (tCO ₂ per TJ)	77.8	80.5	77.5	75.1	72.1	66.5	66.5	-15%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.35	0.4	0.4	0.3	0.3	0.3	0.3	-27%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.34	0.3	0.3	0.3	0.3	0.3	0.2	-27%
CO ₂ / population (tCO ₂ per capita)	6.8	7.2	8.1	8.7	7.5	6.0	5.9	-14%
Share of electricity output from fossil fuels	95%	91%	92%	89%	82%	71%	73%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	1006	962	834	792	729	583	520	-48%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	109	126	136	119	92	90	-10%
Population index	100	103	105	107	108	105	105	5%
GDP PPP per population index	100	103	121	144	140	118	118	18%
Energy intensity index - TPES / GDP PPP	100	99	99	92	85	87	85	-15%
Carbon intensity index - CO ₂ / TPES	100	104	100	97	93	85	85	-15%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	20.1	34.9	7.7	0.4	63.1	-10%
Electricity and heat generation	19.3	3.8	5.2	0.2	28.5	-18%
Other energy industry own use	-	4.5	0.0	-	4.5	113%
Manufacturing industries and construction	0.8	4.2	1.3	0.2	6.5	-33%
Transport	-	17.1	0.0	-	17.2	14%
<i>of which: road</i>	-	14.6	0.0	-	14.7	26%
Other	0.0	5.2	1.1	-	6.4	-21%
<i>of which: residential</i>	0.0	3.9	0.8	-	4.7	1%
<i>of which: services</i>	-	0.5	0.3	-	0.9	67%
<i>Memo: international marine bunkers</i>	-	5.5	-	-	5.5	-32%
<i>Memo: international aviation bunkers</i>	-	2.6	-	-	2.6	11%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	19.3	29.1	21.7	21.7
Road - oil	14.6	11.6	16.5	38.3
Main activity prod. elec. and heat - gas	4.8	-	5.5	43.7
Other energy industry own use - oil	4.5	2.1	5.0	48.8
Manufacturing industries - oil	4.2	5.4	4.8	53.6
Residential - oil	3.9	4.6	4.4	57.9
Main activity prod. elec. and heat - oil	2.8	5.4	3.2	61.2
Other transport - oil	2.5	3.4	2.8	63.9
Non-specified other - oil	1.4	3.4	1.5	65.5
<i>Memo: total CO₂ from fuel combustion</i>	<i>63.1</i>	<i>69.9</i>	<i>71.1</i>	<i>71.1</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Guatemala

Figure 1. CO₂ emissions by fuel

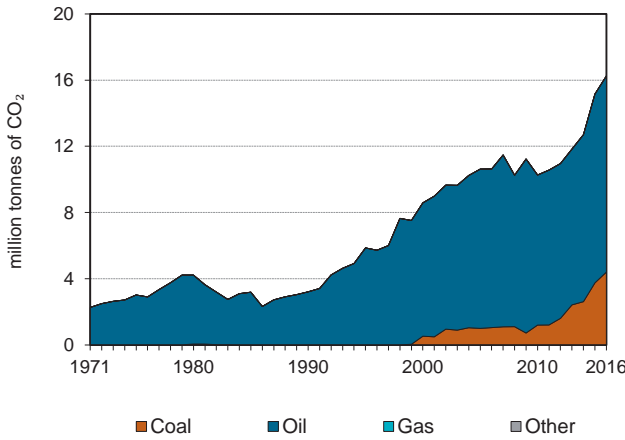


Figure 2. CO₂ emissions by sector

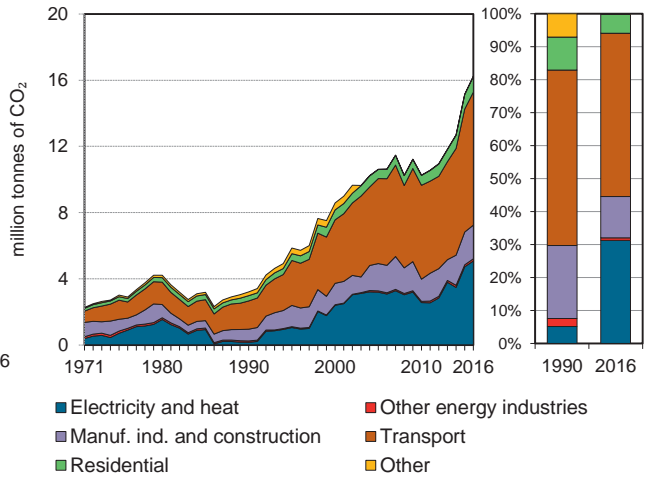


Figure 3. Electricity generation by fuel

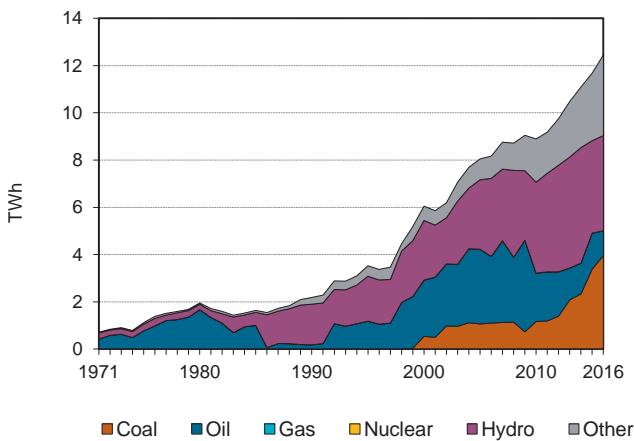


Figure 4. CO₂ from electricity generation: driving factors¹

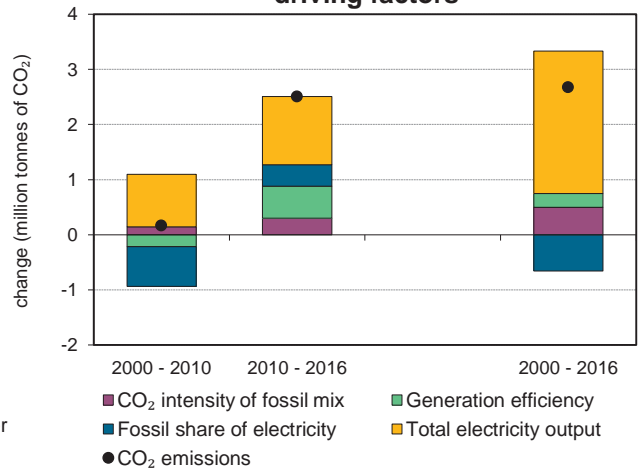


Figure 5. Changes in selected indicators

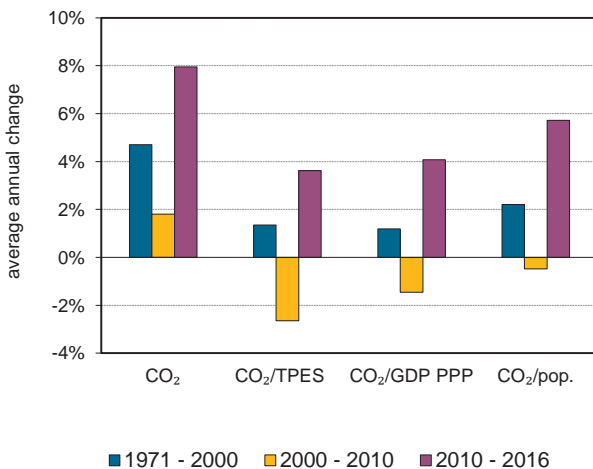
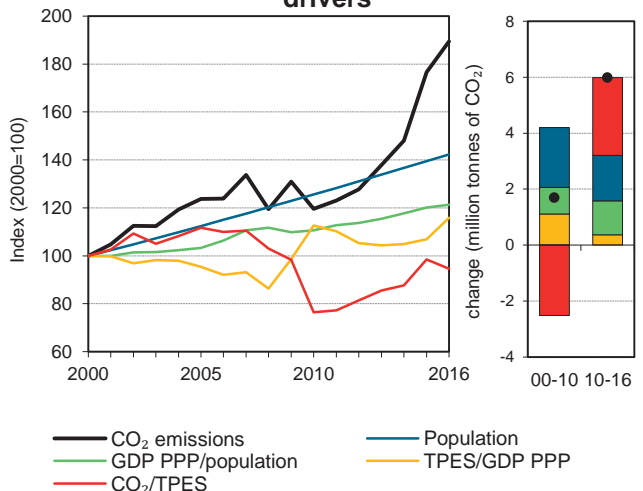


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Guatemala

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	3.2	5.9	8.6	10.6	10.3	15.2	16.3	407%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	
TPES (PJ)	185	223	295	327	461	528	590	219%
GDP (billion 2010 USD)	19.9	24.5	29.8	34.6	41.3	49.9	51.4	159%
GDP PPP (billion 2010 USD)	46.3	57.1	69.3	80.4	96.2	116.1	119.7	159%
Population (millions)	9.3	10.4	11.7	13.1	14.6	16.3	16.6	79%
CO ₂ / TPES (tCO ₂ per TJ)	17.4	26.3	29.1	32.5	22.3	28.7	27.6	59%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.16	0.2	0.3	0.3	0.2	0.3	0.3	96%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.07	0.1	0.1	0.1	0.1	0.1	0.1	97%
CO ₂ / population (tCO ₂ per capita)	0.4	0.6	0.7	0.8	0.7	0.9	1.0	183%
Share of electricity output from fossil fuels	8%	34%	48%	53%	36%	42%	40%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	75	299	397	396	288	404	408	443%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	183	268	331	320	473	507	407%
Population index	100	112	126	141	158	175	179	79%
GDP PPP per population index	100	110	119	123	132	143	144	44%
Energy intensity index - TPES / GDP PPP	100	98	107	102	120	114	123	23%
Carbon intensity index - CO ₂ / TPES	100	151	168	187	128	165	159	59%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	4.4	11.9	-	-	16.3	407%
Electricity and heat generation	4.4	0.7	-	-	5.1	+
Other energy industry own use	-	0.1	-	-	0.1	67%
Manufacturing industries and construction	-	2.0	-	-	2.0	187%
Transport	-	8.0	-	-	8.0	371%
<i>of which: road</i>	-	8.0	-	-	8.0	370%
Other	-	1.0	-	-	1.0	77%
<i>of which: residential</i>	-	0.9	-	-	0.9	195%
<i>of which: services</i>	-	0.0	-	-	0.0	-82%
<i>Memo: international marine bunkers</i>	-	1.1	-	-	1.1	160%
<i>Memo: international aviation bunkers</i>	-	0.2	-	-	0.2	49%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	8.0	1.7	23.7	23.7
Main activity prod. elec. and heat - coal	4.4	-	13.0	36.7
Manufacturing industries - oil	2.0	0.7	6.0	42.8
Residential - oil	0.9	0.3	2.8	45.5
Main activity prod. elec. and heat - oil	0.7	0.2	1.9	47.5
Other energy industry own use - oil	0.1	0.1	0.4	47.9
Non-specified other - oil	0.0	0.2	0.1	47.9
Unallocated autoproducers - oil	0.0	-	0.1	48.0
Unallocated autoproducers - coal	0.0	-	0.0	48.0
<i>Memo: total CO₂ from fuel combustion</i>	<i>16.3</i>	<i>3.2</i>	<i>48.1</i>	<i>48.1</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Haiti

Figure 1. CO₂ emissions by fuel

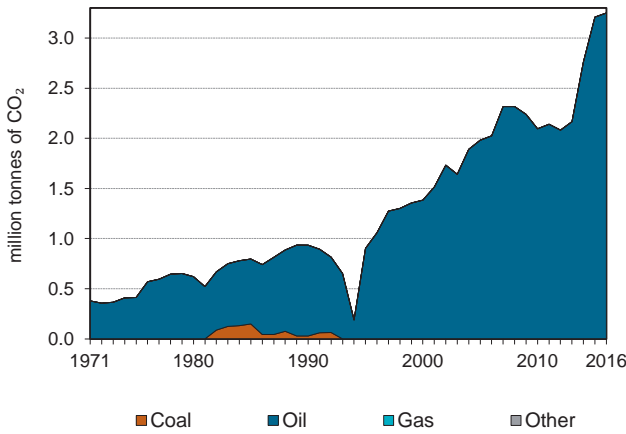


Figure 2. CO₂ emissions by sector

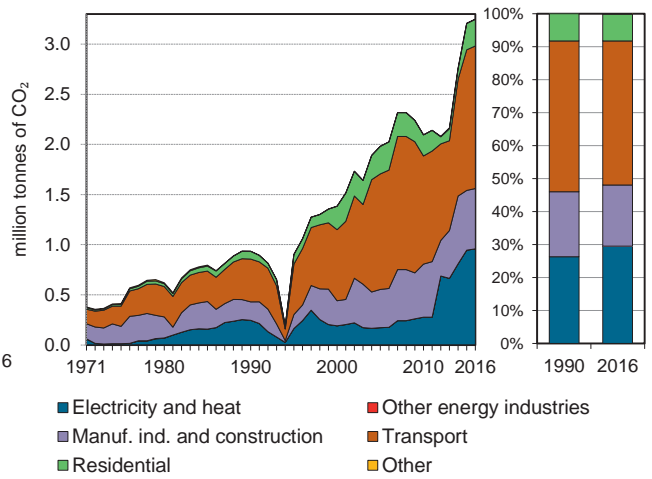


Figure 3. Electricity generation by fuel

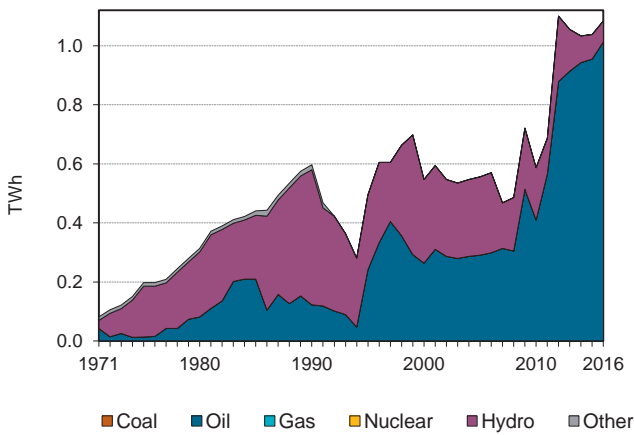


Figure 4. CO₂ from electricity generation: driving factors¹

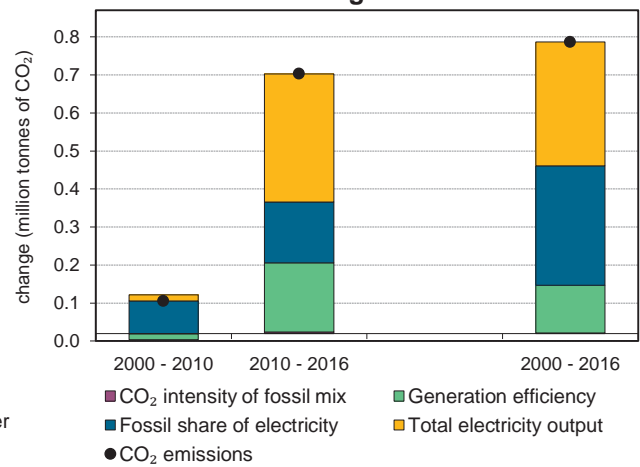


Figure 5. Changes in selected indicators

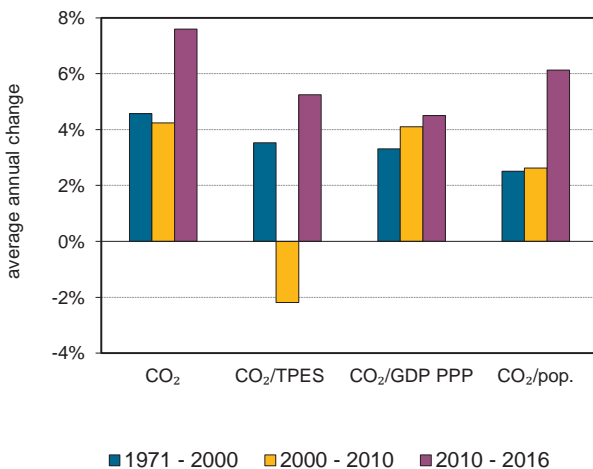
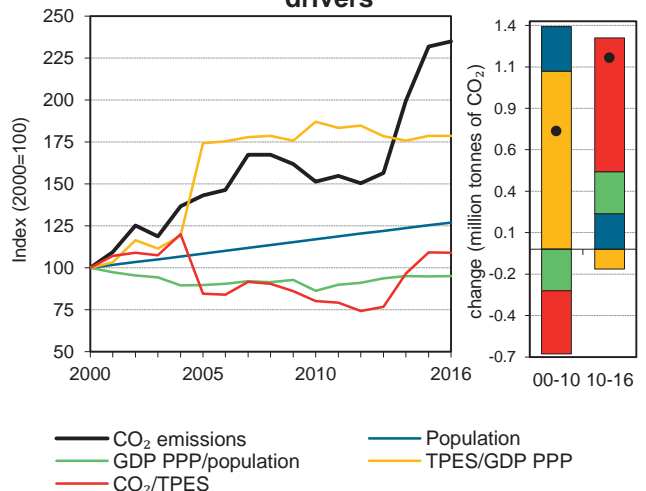


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Haiti

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	0.9	0.9	1.4	2.0	2.1	3.2	3.3	248%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	65	71	84	143	159	179	181	178%
GDP (billion 2010 USD)	6.3	5.8	6.6	6.4	6.6	7.8	7.9	25%
GDP PPP (billion 2010 USD)	14.1	12.9	14.6	14.2	14.7	17.3	17.6	25%
Population (millions)	7.1	7.8	8.5	9.3	10.0	10.7	10.8	53%
CO ₂ / TPES (tCO ₂ per TJ)	14.3	12.7	16.4	13.9	13.2	17.9	17.9	25%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.15	0.2	0.2	0.3	0.3	0.4	0.4	180%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.07	0.1	0.1	0.1	0.1	0.2	0.2	180%
CO ₂ / population (tCO ₂ per capita)	0.1	0.1	0.2	0.2	0.2	0.3	0.3	127%
Share of electricity output from fossil fuels	21%	49%	48%	52%	70%	92%	94%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	412	331	349	310	472	911	884	114%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	97	148	212	224	344	348	248%
Population index	100	110	120	130	141	151	153	53%
GDP PPP per population index	100	83	86	77	74	82	82	-18%
Energy intensity index - TPES / GDP PPP	100	119	124	217	233	222	222	122%
Carbon intensity index - CO ₂ / TPES	100	89	115	97	92	125	125	25%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	3.3	-	-	3.3	248%
Electricity and heat generation	-	1.0	-	-	1.0	289%
Other energy industry own use	-	-	-	-	-	-
Manufacturing industries and construction	-	0.6	-	-	0.6	228%
Transport	-	1.4	-	-	1.4	233%
<i>of which: road</i>	-	1.4	-	-	1.4	663%
Other	-	0.3	-	-	0.3	247%
<i>of which: residential</i>	-	0.3	-	-	0.3	243%
<i>of which: services</i>	-	0.0	-	-	0.0	x
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.1	-	-	0.1	-4%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	1.4	0.2	9.5	9.5
Main activity prod. elec. and heat - oil	0.7	0.2	4.4	14.0
Manufacturing industries - oil	0.6	0.2	4.0	18.0
Unallocated autoproducers - oil	0.3	0.0	2.0	20.0
Residential - oil	0.3	0.1	1.8	21.8
Non-specified other - oil	0.0	-	0.0	21.8
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	3.3	0.9	21.8	21.8

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Honduras

Figure 1. CO₂ emissions by fuel

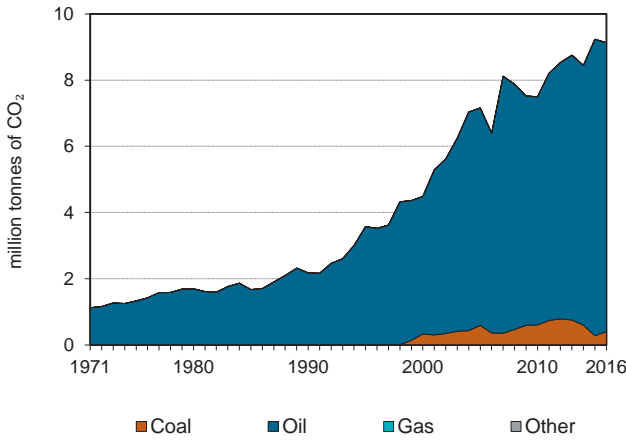


Figure 2. CO₂ emissions by sector

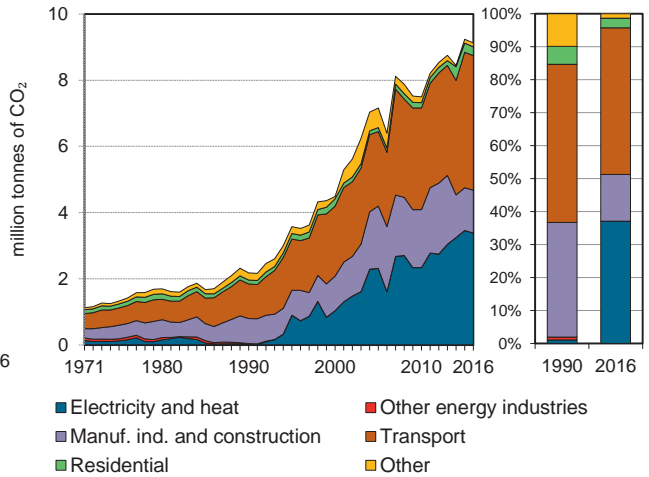


Figure 3. Electricity generation by fuel

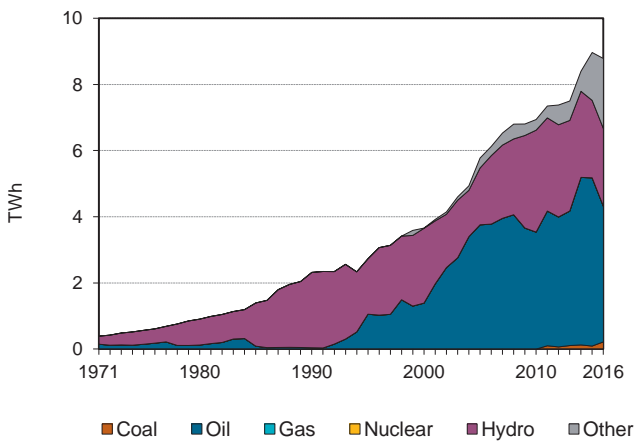


Figure 4. CO₂ from electricity generation: driving factors¹

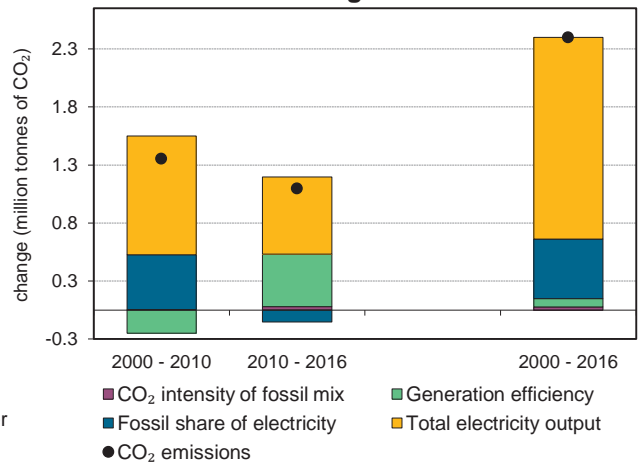


Figure 5. Changes in selected indicators

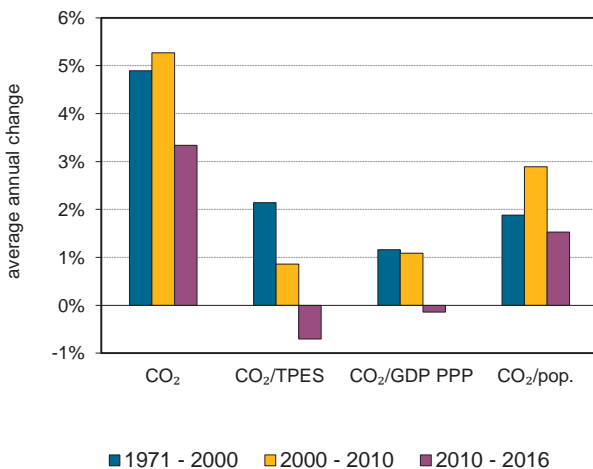
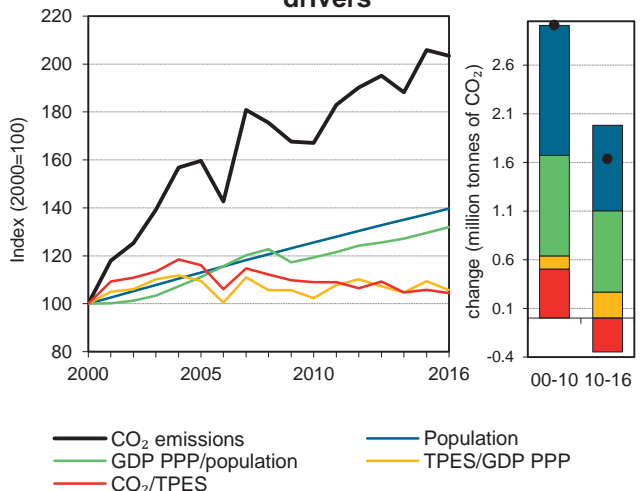


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Honduras

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	2.2	3.6	4.5	7.2	7.5	9.2	9.1	319%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	100	118	126	173	193	245	245	146%
GDP (billion 2010 USD)	7.7	9.1	10.6	13.3	15.8	18.8	19.5	155%
GDP PPP (billion 2010 USD)	15.4	18.3	21.3	26.7	31.9	37.9	39.2	155%
Population (millions)	5	5.7	6.5	7.4	8.2	9.0	9.1	84%
CO ₂ / TPES (tCO ₂ per TJ)	21.9	30.2	35.7	41.5	38.9	37.8	37.3	71%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.29	0.4	0.4	0.5	0.5	0.5	0.5	65%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.14	0.2	0.2	0.3	0.2	0.2	0.2	65%
CO ₂ / population (tCO ₂ per capita)	0.4	0.6	0.7	1.0	0.9	1.0	1.0	128%
Share of electricity output from fossil fuels	2%	39%	38%	65%	51%	58%	49%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	10	330	283	401	337	386	385	3876%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	164	206	329	344	424	419	319%
Population index	100	115	132	149	165	181	184	84%
GDP PPP per population index	100	103	105	117	125	136	138	38%
Energy intensity index - TPES / GDP PPP	100	100	91	100	93	100	96	-4%
Carbon intensity index - CO ₂ / TPES	100	138	163	190	178	173	171	71%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.4	8.7	-	-	9.1	319%
Electricity and heat generation	0.2	3.2	-	-	3.4	+
Other energy industry own use	-	-	-	-	-	-100%
Manufacturing industries and construction	0.2	1.1	-	-	1.3	71%
Transport	-	4.1	-	-	4.1	289%
<i>of which: road</i>	-	3.9	-	-	3.9	271%
Other	-	0.4	-	-	0.4	16%
<i>of which: residential</i>	-	0.3	-	-	0.3	125%
<i>of which: services</i>	-	-	-	-	-	-100%
<i>Memo: international marine bunkers</i>	-	0.0	-	-	0.0	x
<i>Memo: international aviation bunkers</i>	-	0.2	-	-	0.2	103%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	3.9	1.0	18.8	18.8
Main activity prod. elec. and heat - oil	2.7	0.0	13.1	31.8
Manufacturing industries - oil	1.1	0.8	5.3	37.2
Unallocated autoproducers - oil	0.5	0.0	2.3	39.5
Residential - oil	0.3	0.1	1.3	40.7
Unallocated autoproducers - coal	0.2	-	1.0	41.7
Manufacturing industries - coal	0.2	0.0	0.9	42.7
Other transport - oil	0.2	-	0.9	43.6
Non-specified other - oil	0.1	0.2	0.6	44.2
<i>Memo: total CO₂ from fuel combustion</i>	9.1	2.2	44.2	44.2

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Hong Kong, China

Figure 1. CO₂ emissions by fuel

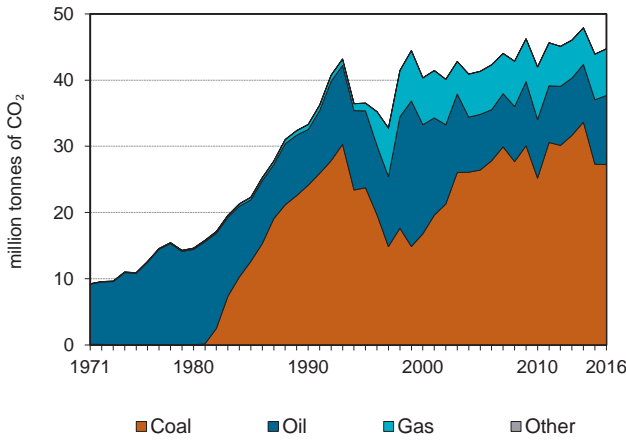


Figure 2. CO₂ emissions by sector

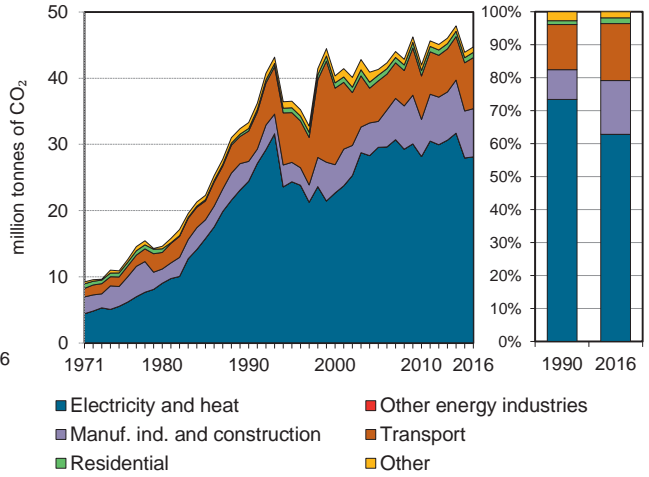


Figure 3. Electricity generation by fuel

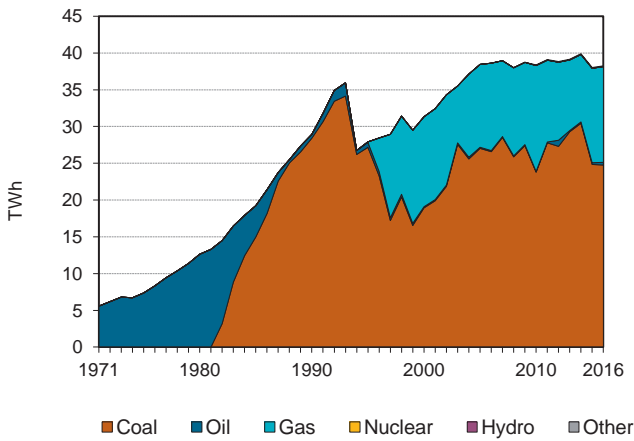


Figure 4. CO₂ from electricity generation: driving factors¹

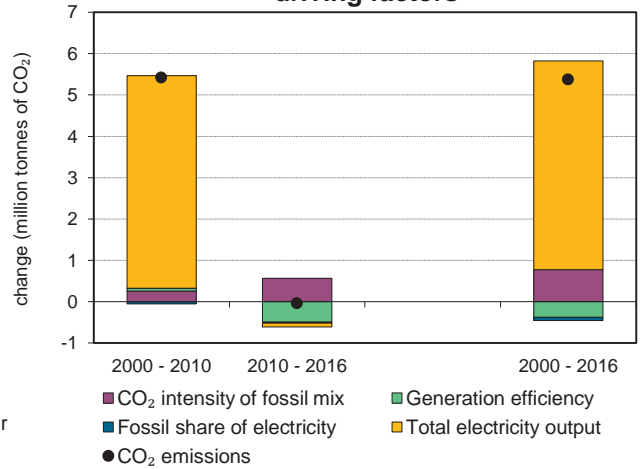


Figure 5. Changes in selected indicators

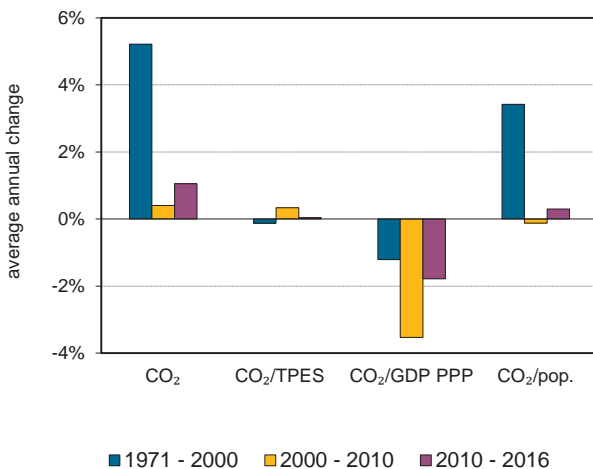
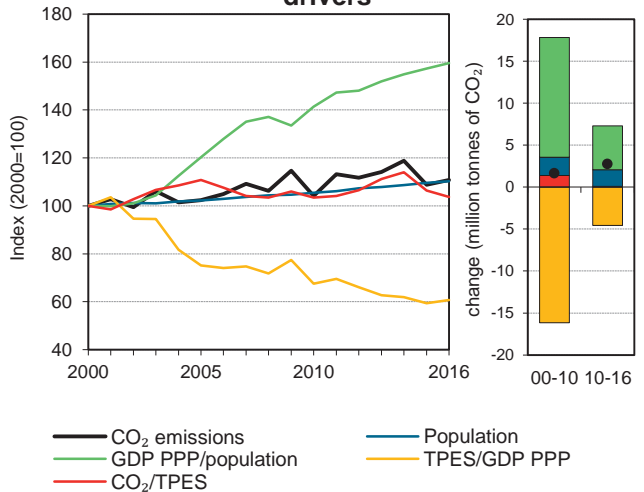


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Hong Kong, China

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	33.3	36.5	40.3	41.3	42.0	43.9	44.7	34%
Share of World CO ₂ from fuel combustion	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	
TPES (PJ)	361	443	569	526	573	582	608	69%
GDP (billion 2010 USD)	104.1	134.8	153.4	188.6	228.6	264.4	269.8	159%
GDP PPP (billion 2010 USD)	150.8	195.2	222.1	273.2	331.1	382.9	390.7	159%
Population (millions)	5.7	6.2	6.7	6.8	7.0	7.3	7.3	29%
CO ₂ / TPES (tCO ₂ per TJ)	92.3	82.4	70.9	78.6	73.4	75.5	73.5	-20%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.32	0.3	0.3	0.2	0.2	0.2	0.2	-48%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.22	0.2	0.2	0.2	0.1	0.1	0.1	-48%
CO ₂ / population (tCO ₂ per capita)	5.8	5.9	6.1	6.1	6.0	6.0	6.1	4%
Share of electricity output from fossil fuels	100%	100%	100%	100%	100%	100%	100%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	845	872	724	769	734	735	735	-13%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	110	121	124	126	132	134	34%
Population index	100	108	117	119	123	128	129	29%
GDP PPP per population index	100	120	126	152	178	198	201	101%
Energy intensity index - TPES / GDP PPP	100	95	107	80	72	64	65	-35%
Carbon intensity index - CO ₂ / TPES	100	89	77	85	79	82	80	-20%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	27.2	10.4	7.1	-	44.7	34%
Electricity and heat generation	22.2	0.3	5.6	-	28.1	15%
Other energy industry own use	-	-	-	-	-	-
Manufacturing industries and construction	5.0	2.2	0.1	-	7.3	144%
Transport	-	7.7	-	-	7.7	68%
<i>of which: road</i>	-	7.7	-	-	7.7	68%
Other	-	0.2	1.4	-	1.6	26%
<i>of which: residential</i>	-	0.0	0.8	-	0.8	107%
<i>of which: services</i>	-	0.2	0.6	-	0.8	-9%
<i>Memo: international marine bunkers</i>	-	28.6	-	-	28.6	526%
<i>Memo: international aviation bunkers</i>	-	19.6	-	-	19.6	244%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	22.2	24.1	44.9	44.9
Road - oil	7.7	4.6	15.6	60.5
Main activity prod. elec. and heat - gas	5.6	-	11.3	71.9
Manufacturing industries - coal	5.0	0.0	10.2	82.1
Manufacturing industries - oil	2.2	3.0	4.4	86.5
Residential - gas	0.8	0.4	1.6	88.0
Non-specified other - gas	0.6	0.3	1.2	89.3
Main activity prod. elec. and heat - oil	0.3	0.3	0.6	89.9
Non-specified other - oil	0.2	0.5	0.4	90.3
<i>Memo: total CO₂ from fuel combustion</i>	<i>44.7</i>	<i>33.3</i>	<i>90.5</i>	<i>90.5</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Hungary¹

Figure 1. CO₂ emissions by fuel

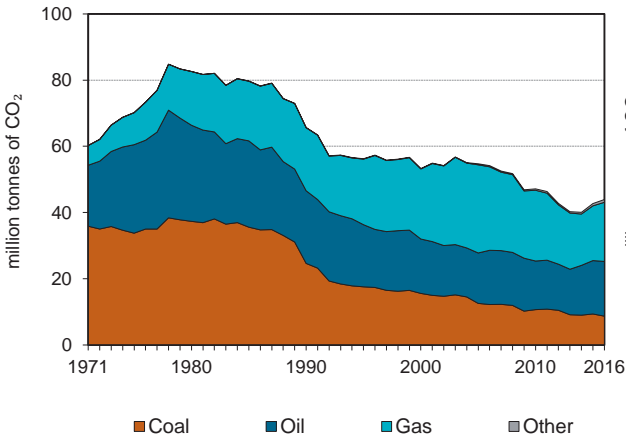


Figure 2. CO₂ emissions by sector

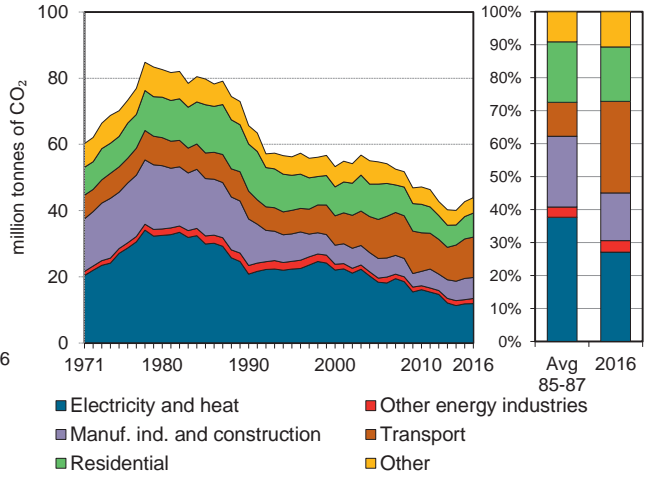


Figure 3. Electricity generation by fuel

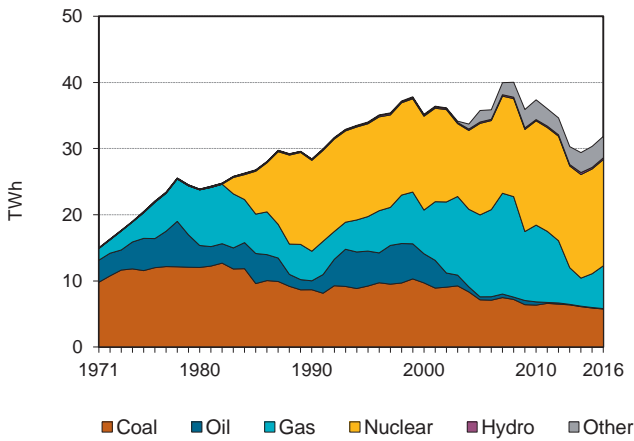


Figure 4. CO₂ from electricity generation: driving factors²

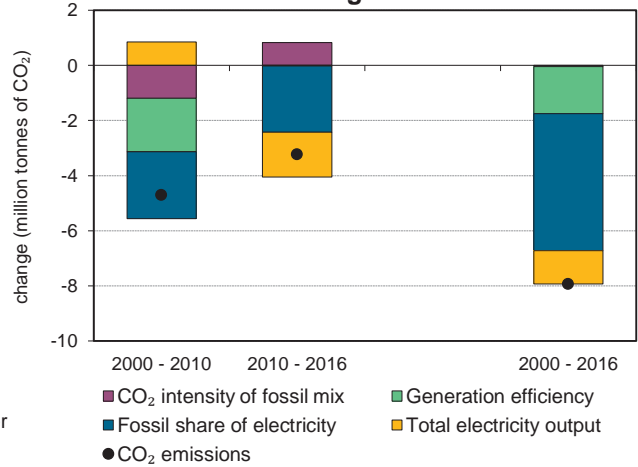


Figure 5. Changes in selected indicators

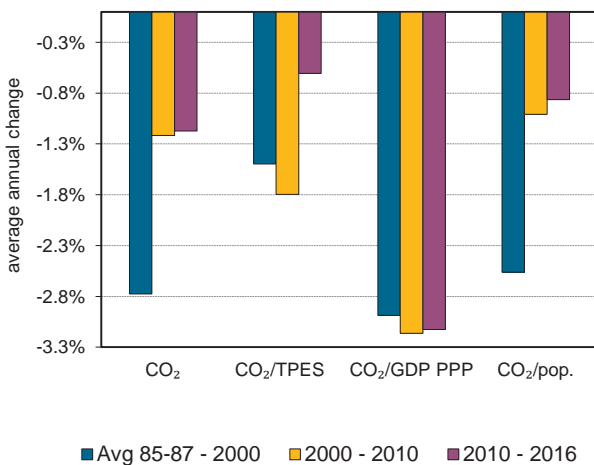
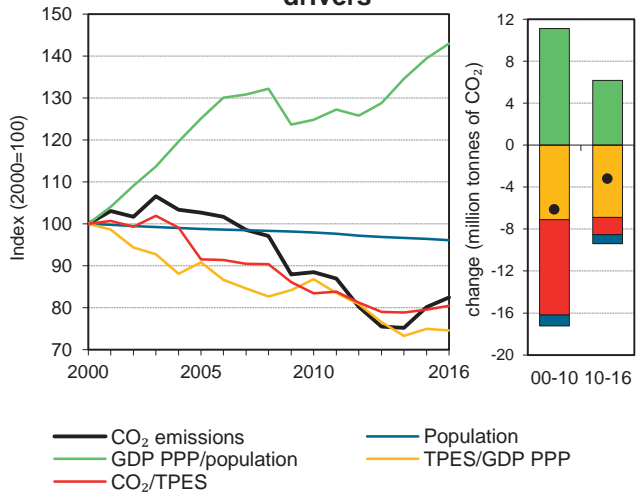


Figure 6. Total CO₂ emissions and drivers³



1. Under the Convention Hungary is allowed use the average of 85-87 as its base year.

2. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.

3. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Hungary ¹

Key indicators

	Avg 85-87	1990	1995	2005	2010	2015	2016	%change base-16
CO ₂ fuel combustion (MtCO ₂)	79	65.7	56.2	54.7	47.1	42.7	43.9	-44%
Share of World CO ₂ from fuel combustion	0.4%	0.3%	0.3%	0.2%	0.2%	0.1%	0.1%	
TPES (PJ)	1258	1 205	1 083	1 174	1 110	1 055	1 073	-15%
GDP (billion 2010 USD)	104	104.2	92.5	132.3	130.9	144.0	147.2	42%
GDP PPP (billion 2010 USD)	171.4	171.8	152.4	218.1	215.8	237.3	242.6	42%
Population (millions)	10.5	10.4	10.3	10.1	10.0	9.8	9.8	-7%
CO ₂ / TPES (tCO ₂ per TJ)	62.8	54.5	52.0	46.6	42.5	40.5	40.9	-35%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.76	0.6	0.6	0.4	0.4	0.3	0.3	-61%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.46	0.4	0.4	0.3	0.2	0.2	0.2	-61%
CO ₂ / population (tCO ₂ per capita)	7.5	6.3	5.4	5.4	4.7	4.3	4.5	-40%
Share of electricity output from fossil fuels	0%	51%	58%	56%	50%	37%	39%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	0	503	518	374	319	274	273	0%
CO₂ emissions and drivers - Kaya decomposition (Avg 85-87=100) ²								
CO ₂ emissions index	100	83	71	69	60	54	56	-44%
Population index	100	98	98	96	95	93	93	-7%
GDP PPP per population index	100	102	91	133	133	148	152	52%
Energy intensity index - TPES / GDP PPP	100	96	97	73	70	61	60	-40%
Carbon intensity index - CO ₂ / TPES	100	87	83	74	68	64	65	-35%

1. Under the Convention Hungary is allowed use the average of 85-87 as its base year. 2. Please see Part I for methodological notes.

2016 CO₂ emissions by sector

million tonnes of CO ₂	Coal	Oil	Natural gas	Other ³	Total	%change base-16
CO₂ fuel combustion	8.7	16.5	17.9	0.8	43.9	-44%
Electricity and heat generation	7.1	0.1	4.3	0.5	11.9	-60%
Other energy industry own use	0.1	1.0	0.4	-	1.5	-38%
Manufacturing industries and construction	1.0	2.0	3.1	0.4	6.4	-63%
Transport	-	12.1	0.1	-	12.2	50%
<i>of which: road</i>	-	11.9	0.0	-	12.0	70%
Other	0.5	1.4	10.0	0.0	11.9	-45%
<i>of which: residential</i>	0.5	0.2	6.6	-	7.3	-50%
<i>of which: services</i>	0.0	0.1	3.0	0.0	3.1	6%
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.6	-	-	0.6	29%

3. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	Avg 85-87 CO ₂ emissions (MtCO ₂)	Share in total GHG ⁴ (%)	Cumulative total (%)
Road - oil	11.9	7.0	19.4	19.4
Main activity prod. elec. and heat - coal	7.0	17.0	11.4	30.8
Residential - gas	6.6	2.5	10.7	41.5
Main activity prod. elec. and heat - gas	4.2	4.8	6.8	48.3
Non-specified other - gas	3.4	1.7	5.5	53.7
Manufacturing industries - gas	3.1	7.7	5.0	58.7
Manufacturing industries - oil	2.0	3.2	3.2	61.9
Non-specified other - oil	1.3	4.2	2.1	63.9
Other energy industry own use - oil	1.0	1.8	1.6	65.6
<i>Memo: total CO₂ from fuel combustion</i>	43.9	79	71.3	71.3

4. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Iceland

Figure 1. CO₂ emissions by fuel

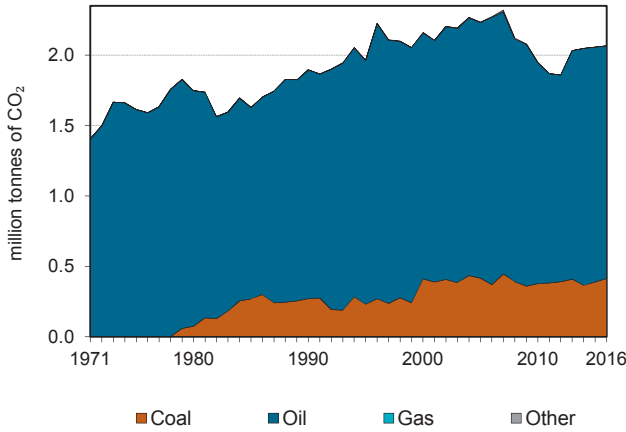


Figure 2. CO₂ emissions by sector

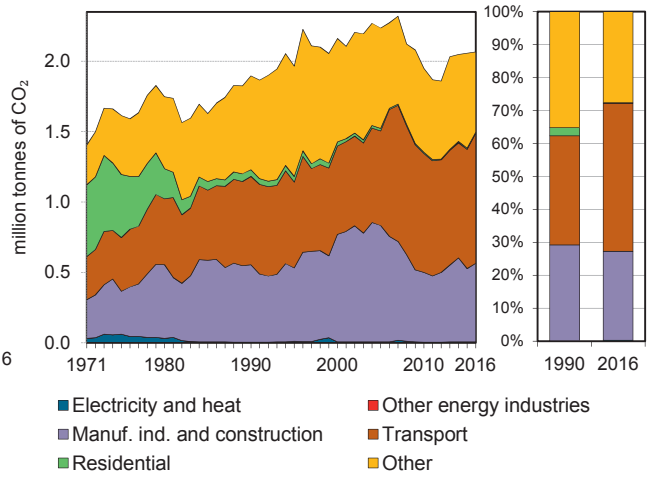


Figure 3. Electricity generation by fuel

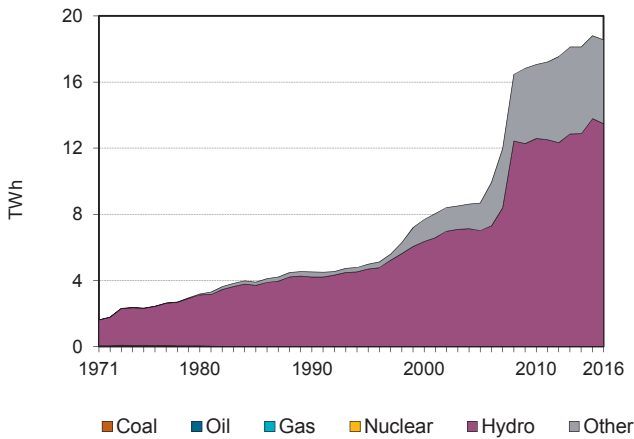


Figure 4. CO₂ from electricity generation: driving factors¹

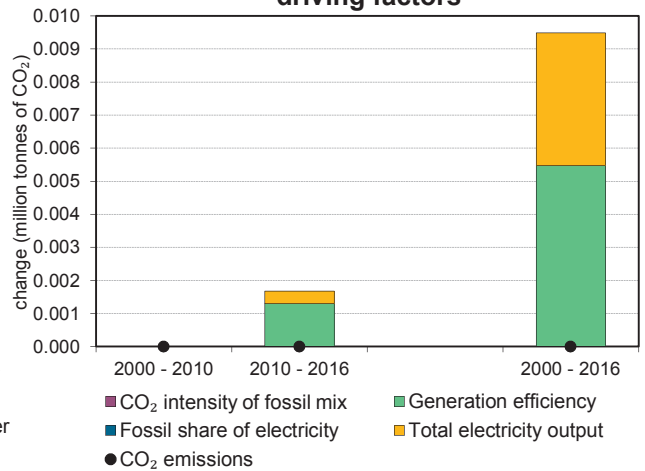


Figure 5. Changes in selected indicators

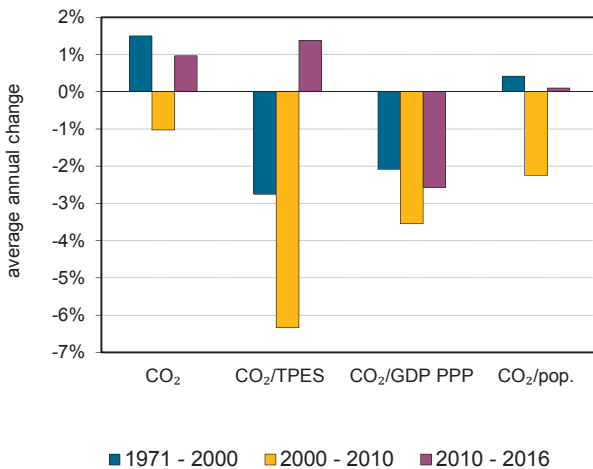
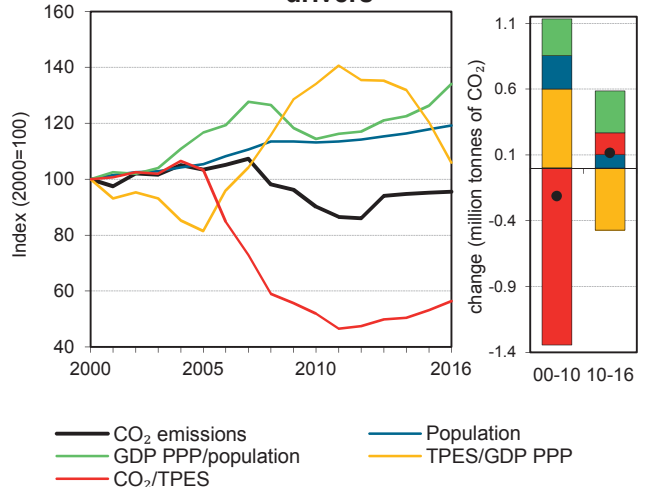


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Iceland

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	1.9	2.0	2.2	2.2	1.9	2.1	2.1	9%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	95	92	131	131	227	234	221	133%
GDP (billion 2010 USD)	7.8	7.9	10.3	12.6	13.3	15.3	16.4	111%
GDP PPP (billion 2010 USD)	7.2	7.3	9.5	11.6	12.3	14.1	15.1	111%
Population (millions)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	31%
CO ₂ / TPES (tCO ₂ per TJ)	20	21.2	16.5	17.1	8.6	8.8	9.3	-53%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.24	0.2	0.2	0.2	0.1	0.1	0.1	-48%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.27	0.3	0.2	0.2	0.2	0.1	0.1	-49%
CO ₂ / population (tCO ₂ per capita)	7.4	7.4	7.7	7.6	6.1	6.2	6.2	-17%
Share of electricity output from fossil fuels	0%	0%	0%	0%	0%	0%	0%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	1	1	0	0	0	0	0	-51%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	104	114	118	103	109	109	9%
Population index	100	105	110	116	125	130	131	31%
GDP PPP per population index	100	97	120	140	137	151	161	61%
Energy intensity index - TPES / GDP PPP	100	96	104	85	139	125	110	10%
Carbon intensity index - CO ₂ / TPES	100	107	83	86	43	44	47	-53%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.4	1.7	-	-	2.1	9%
Electricity and heat generation	-	0.0	-	-	0.0	100%
Other energy industry own use	-	-	-	-	-	-
Manufacturing industries and construction	0.4	0.1	-	-	0.6	1%
Transport	-	0.9	-	-	0.9	47%
<i>of which: road</i>	-	0.9	-	-	0.9	64%
Other	-	0.6	-	-	0.6	-19%
<i>of which: residential</i>	-	0.0	-	-	0.0	-87%
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	0.2	-	-	0.2	86%
<i>Memo: international aviation bunkers</i>	-	0.9	-	-	0.9	310%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	0.9	0.5	17.4	17.4
Non-specified other - oil	0.6	0.7	11.3	28.7
Manufacturing industries - coal	0.4	0.3	8.2	36.9
Manufacturing industries - oil	0.1	0.3	2.9	39.8
Other transport - oil	0.0	0.1	1.0	40.8
Main activity prod. elec. and heat - oil	0.0	0.0	0.1	40.9
Residential - oil	0.0	0.0	0.1	41.0
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	2.1	1.9	41.0	41.0

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

India

Figure 1. CO₂ emissions by fuel

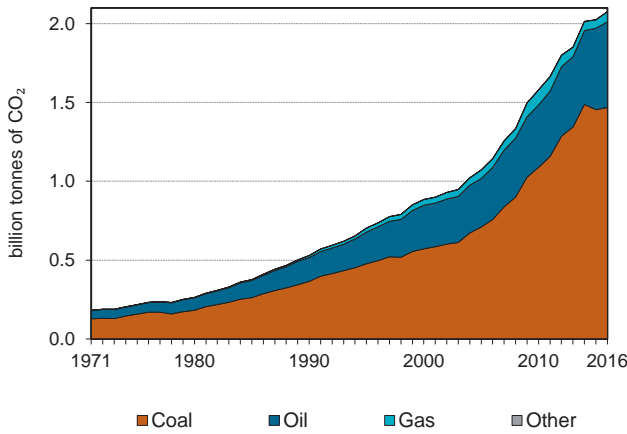


Figure 2. CO₂ emissions by sector

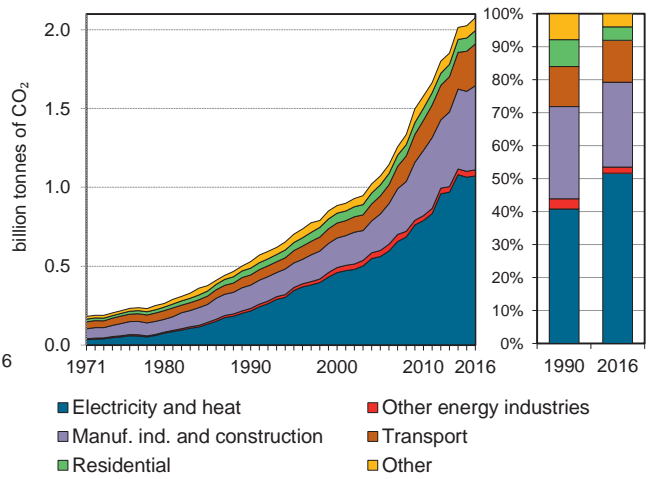


Figure 3. Electricity generation by fuel

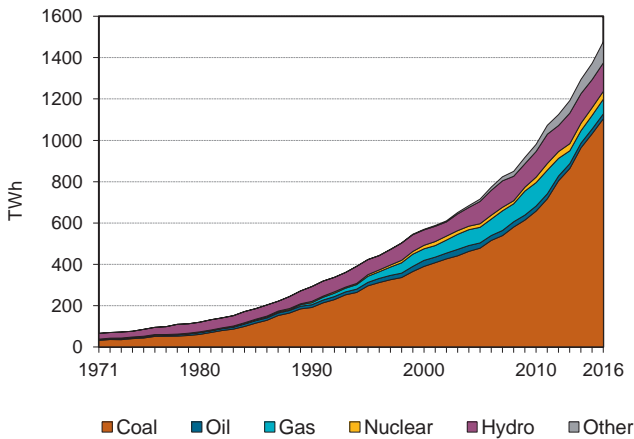


Figure 4. CO₂ from electricity generation: driving factors¹

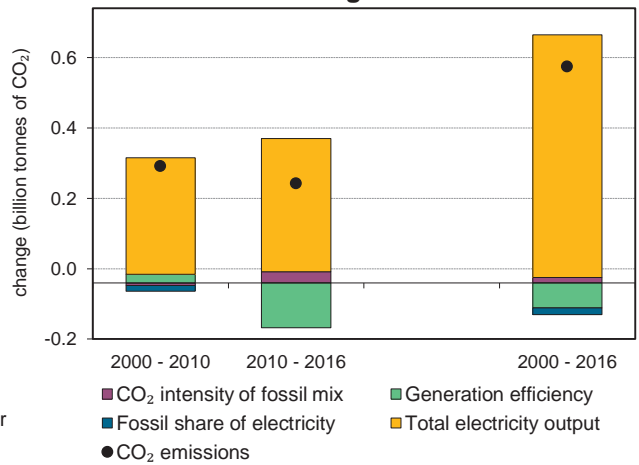


Figure 5. Changes in selected indicators

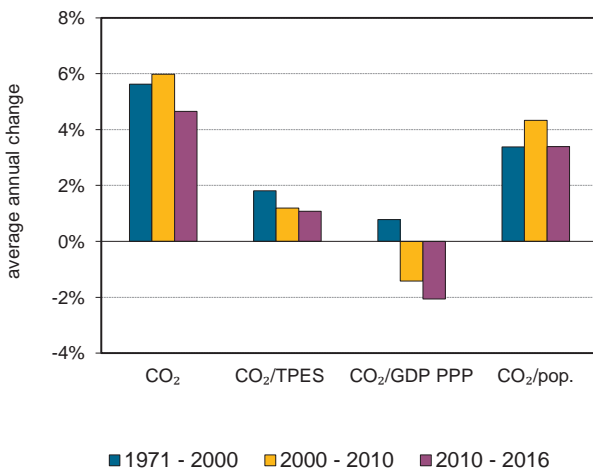
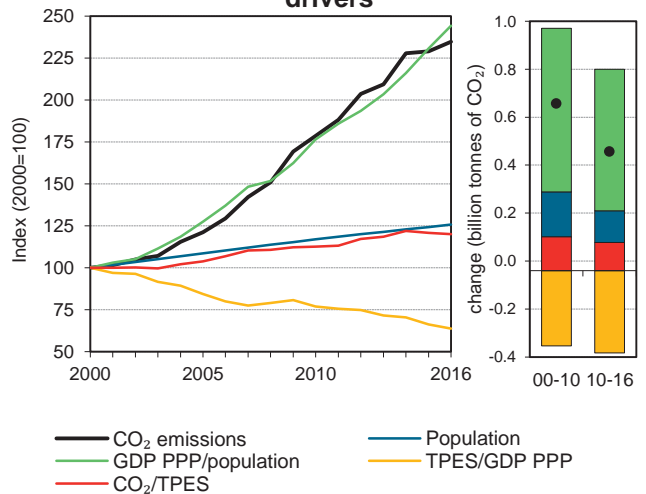


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

India

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	529.1	703.3	884.7	1 072.1	1 580.6	2 026.1	2 076.8	293%
Share of World CO ₂ from fuel combustion	2.6%	3.3%	3.8%	4.0%	5.2%	6.3%	6.4%	
TPES (PJ)	12801	15 543	18 461	21 542	29 310	35 024	36 106	182%
GDP (billion 2010 USD)	466.5	597.7	802.8	1 111.2	1 656.6	2 301.4	2 464.9	428%
GDP PPP (billion 2010 USD)	1496.1	1 916.7	2 574.3	3 563.4	5 312.4	7 380.0	7 904.5	428%
Population (millions)	870.1	960.5	1 053.1	1 144.1	1 231.0	1 309.1	1 324.2	52%
CO ₂ / TPES (tCO ₂ per TJ)	41.3	45.3	47.9	49.8	53.9	57.8	57.5	39%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.13	1.2	1.1	1.0	1.0	0.9	0.8	-26%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.35	0.4	0.3	0.3	0.3	0.3	0.3	-26%
CO ₂ / population (tCO ₂ per capita)	0.6	0.7	0.8	0.9	1.3	1.5	1.6	158%
Share of electricity output from fossil fuels	73%	81%	83%	81%	81%	82%	81%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	737	816	806	784	806	776	726	-2%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	133	167	203	299	383	393	293%
Population index	100	110	121	131	141	150	152	52%
GDP PPP per population index	100	116	142	181	251	328	347	247%
Energy intensity index - TPES / GDP PPP	100	95	84	71	64	55	53	-47%
Carbon intensity index - CO ₂ / TPES	100	109	116	120	130	140	139	39%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	1 468.1	544.3	63.0	1.4	2 076.8	293%
Electricity and heat generation	1 013.0	24.6	33.5	1.4	1 072.5	397%
Other energy industry own use	3.4	34.0	1.5	-	38.9	140%
Manufacturing industries and construction	405.8	110.0	18.0	-	533.8	261%
Transport	-	259.3	6.0	-	265.3	312%
<i>of which: road</i>	-	241.7	5.0	-	246.8	420%
Other	46.0	116.4	4.0	-	166.4	96%
<i>of which: residential</i>	10.2	72.7	1.8	-	84.7	96%
<i>of which: services</i>	17.0	5.5	1.9	-	24.5	85%
<i>Memo: international marine bunkers</i>	-	4.8	-	-	4.8	250%
<i>Memo: international aviation bunkers</i>	-	15.6	-	-	15.6	317%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	868.3	179.4	26.1	26.1
Manufacturing industries - coal	405.8	120.8	12.2	38.3
Road - oil	241.7	47.5	7.3	45.5
Unallocated autoproducers - coal	144.7	12.3	4.3	49.9
Manufacturing industries - oil	110.0	26.0	3.3	53.2
Residential - oil	72.7	32.2	2.2	55.4
Non-specified other - oil	43.7	13.9	1.3	56.7
Non-specified other sectors - coal	35.8	27.4	1.1	57.8
Other energy industry own use - oil	34.0	7.5	1.0	58.8
<i>Memo: total CO₂ from fuel combustion</i>	<i>2076.8</i>	<i>529.1</i>	<i>62.4</i>	<i>62.4</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Indonesia

Figure 1. CO₂ emissions by fuel

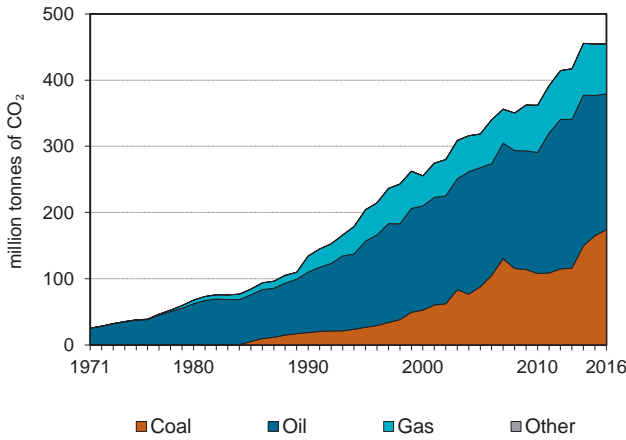


Figure 2. CO₂ emissions by sector

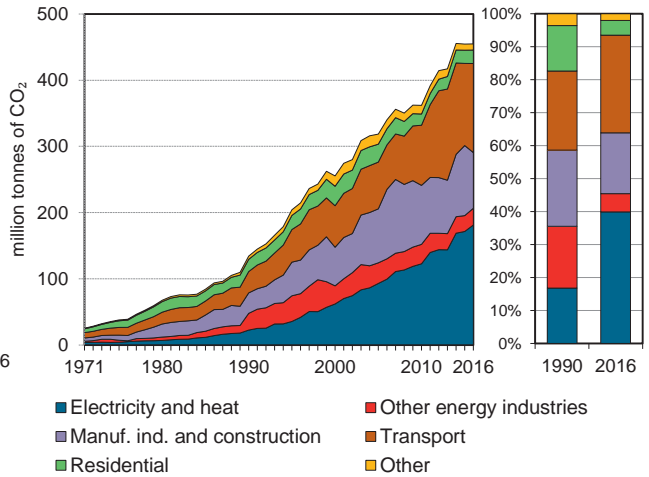


Figure 3. Electricity generation by fuel

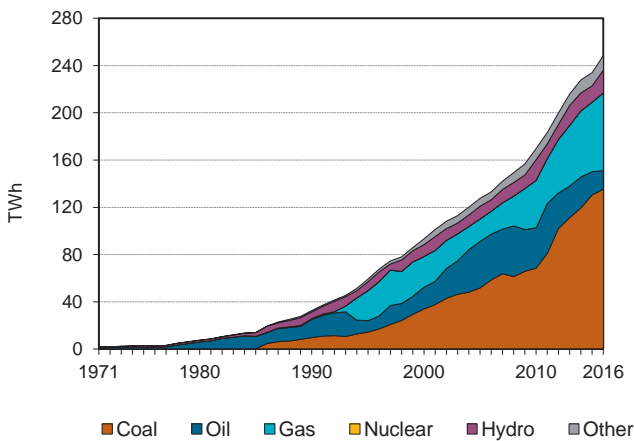


Figure 4. CO₂ from electricity generation: driving factors¹

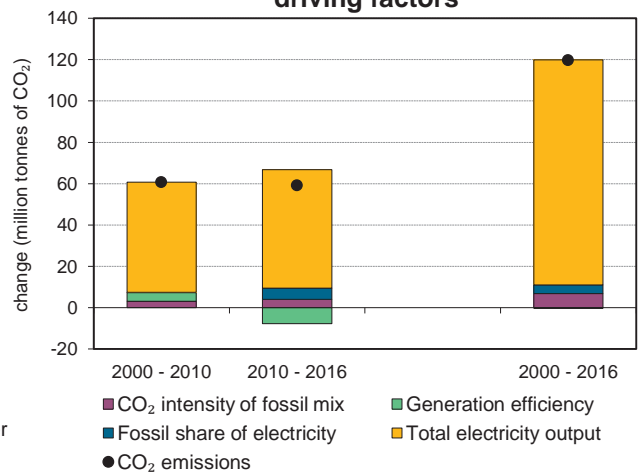


Figure 5. Changes in selected indicators

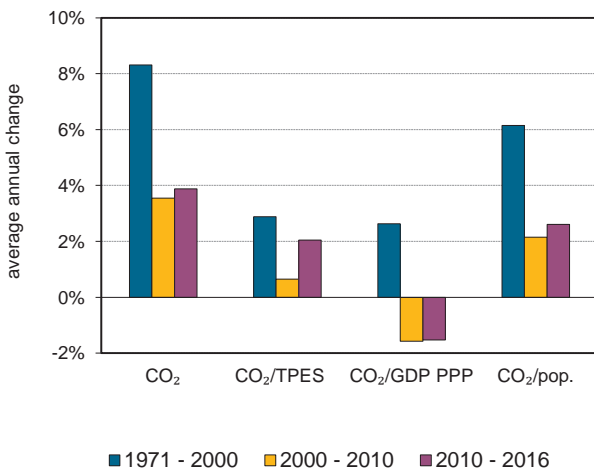
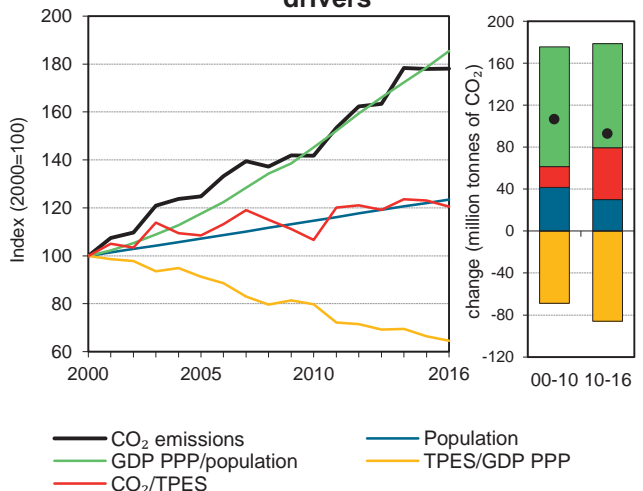


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Indonesia

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	134.2	204.2	255.4	318.6	362.0	454.6	454.9	239%
Share of World CO ₂ from fuel combustion	0.7%	1.0%	1.1%	1.2%	1.2%	1.4%	1.4%	
TPES (PJ)	4131	5 479	6 518	7 499	8 661	9 428	9 636	133%
GDP (billion 2010 USD)	309.8	437.2	453.4	571.2	755.1	988.1	1 037.7	235%
GDP PPP (billion 2010 USD)	822.2	1 160.3	1 203.3	1 515.9	2 004.0	2 622.4	2 753.9	235%
Population (millions)	181.4	197.0	211.5	226.7	242.5	258.2	261.1	44%
CO ₂ / TPES (tCO ₂ per TJ)	32.5	37.3	39.2	42.5	41.8	48.2	47.2	45%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.43	0.5	0.6	0.6	0.5	0.5	0.4	1%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.16	0.2	0.2	0.2	0.2	0.2	0.2	1%
CO ₂ / population (tCO ₂ per capita)	0.7	1.0	1.2	1.4	1.5	1.8	1.7	135%
Share of electricity output from fossil fuels	79%	84%	84%	86%	84%	89%	87%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	689	600	664	729	723	733	729	6%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	152	190	237	270	339	339	239%
Population index	100	109	117	125	134	142	144	44%
GDP PPP per population index	100	130	126	148	182	224	233	133%
Energy intensity index - TPES / GDP PPP	100	94	108	98	86	72	70	-30%
Carbon intensity index - CO ₂ / TPES	100	115	121	131	129	148	145	45%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	174.1	205.3	75.5	0.0	454.9	239%
Electricity and heat generation	136.1	11.8	33.4	0.0	181.3	706%
Other energy industry own use	-	6.8	18.5	-	25.3	0%
Manufacturing industries and construction	38.0	23.2	23.0	-	84.2	172%
Transport	-	134.5	0.1	-	134.5	318%
<i>of which: road</i>	-	117.8	0.1	-	117.9	308%
Other	-	29.1	0.5	-	29.6	27%
<i>of which: residential</i>	-	20.3	0.0	-	20.4	10%
<i>of which: services</i>	-	2.3	0.4	-	2.7	168%
<i>Memo: international marine bunkers</i>	-	0.8	-	-	0.8	-54%
<i>Memo: international aviation bunkers</i>	-	2.8	-	-	2.8	186%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	117.8	28.9	12.1	12.1
Main activity prod. elec. and heat - coal	91.2	9.3	9.3	21.4
Unallocated autoproducers - coal	44.8	-	4.6	26.0
Manufacturing industries - coal	38.0	9.1	3.9	29.9
Main activity prod. elec. and heat - gas	29.3	0.5	3.0	32.9
Manufacturing industries - oil	23.2	17.3	2.4	35.2
Manufacturing industries - gas	23.0	4.5	2.4	37.6
Residential - oil	20.3	18.5	2.1	39.7
Other energy industry own use - gas	18.5	19.3	1.9	41.6
<i>Memo: total CO₂ from fuel combustion</i>	<i>454.9</i>	<i>134.2</i>	<i>46.6</i>	<i>46.6</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Islamic Republic of Iran

Figure 1. CO₂ emissions by fuel

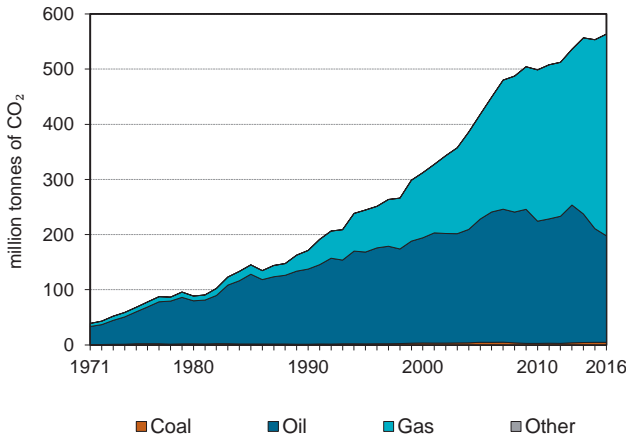


Figure 2. CO₂ emissions by sector

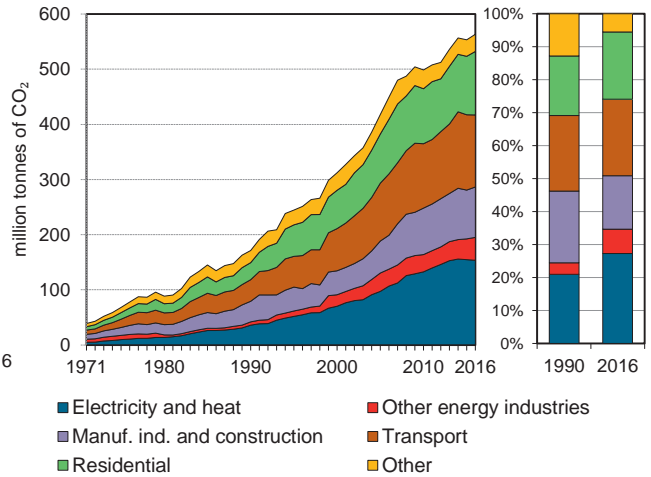


Figure 3. Electricity generation by fuel

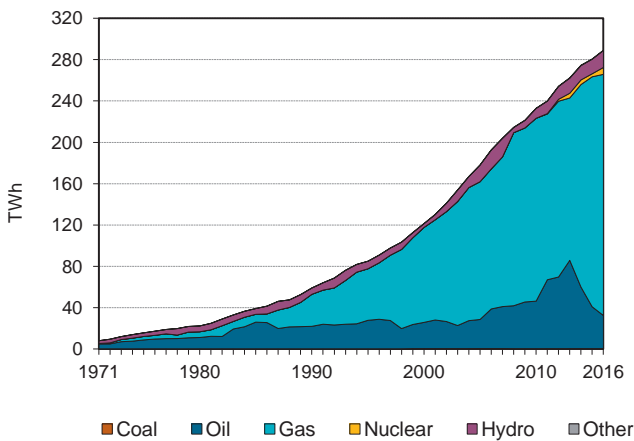


Figure 4. CO₂ from electricity generation: driving factors¹

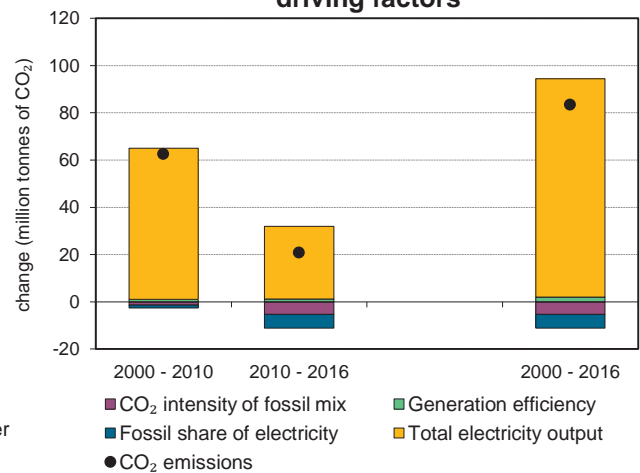


Figure 5. Changes in selected indicators

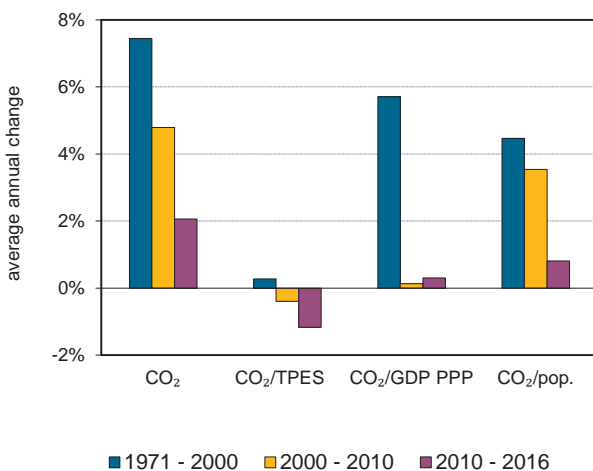
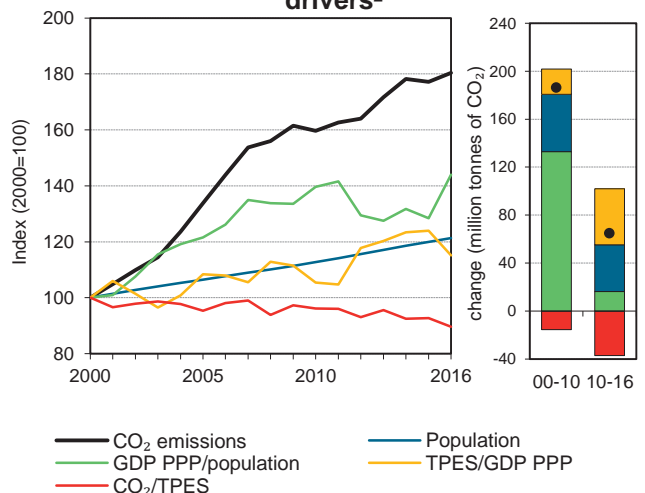


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Islamic Republic of Iran

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	171.3	244.6	312.3	417.8	498.6	553.3	563.4	229%
Share of World CO ₂ from fuel combustion	0.8%	1.1%	1.3%	1.5%	1.6%	1.7%	1.7%	
TPES (PJ)	2903	4 238	5 151	7 230	8 554	9 846	10 369	257%
GDP (billion 2010 USD)	205.5	237.3	281.9	368.5	467.8	456.9	486.8	137%
GDP PPP (billion 2010 USD)	606.8	700.7	832.4	1 077.5	1 310.9	1 283.0	1 454.9	140%
Population (millions)	56.2	60.6	66.1	70.4	74.6	79.4	80.3	43%
CO ₂ / TPES (tCO ₂ per TJ)	59	57.7	60.6	57.8	58.3	56.2	54.3	-8%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.83	1.0	1.1	1.1	1.1	1.2	1.2	39%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.28	0.3	0.4	0.4	0.4	0.4	0.4	37%
CO ₂ / population (tCO ₂ per capita)	3.1	4.0	4.7	5.9	6.7	7.0	7.0	130%
Share of electricity output from fossil fuels	90%	91%	97%	91%	96%	94%	92%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	608	610	579	545	569	551	531	-13%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	143	182	244	291	323	329	229%
Population index	100	108	118	125	133	141	143	43%
GDP PPP per population index	100	107	117	142	163	150	168	68%
Energy intensity index - TPES / GDP PPP	100	126	129	140	136	160	149	49%
Carbon intensity index - CO ₂ / TPES	100	98	103	98	99	95	92	-8%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	4.6	193.3	365.5	-	563.4	229%
Electricity and heat generation	1.8	29.0	122.8	-	153.6	328%
Other energy industry own use	1.1	11.6	28.8	-	41.5	597%
Manufacturing industries and construction	1.7	10.8	78.9	-	91.4	145%
Transport	-	114.6	16.1	-	130.6	234%
<i>of which: road</i>	-	99.6	15.2	-	114.8	193%
Other	0.0	27.3	119.0	-	146.3	177%
<i>of which: residential</i>	0.0	15.1	100.0	-	115.1	272%
<i>of which: services</i>	-	4.4	15.1	-	19.4	99%
<i>Memo: international marine bunkers</i>	-	15.6	-	-	15.6	+
<i>Memo: international aviation bunkers</i>	-	4.7	-	-	4.7	211%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - gas	118.7	15.8	14.3	14.3
Residential - gas	100.0	6.1	12.0	26.3
Road - oil	99.6	39.2	12.0	38.3
Manufacturing industries - gas	78.9	10.8	9.5	47.7
Main activity prod. elec. and heat - oil	29.0	17.2	3.5	51.2
Other energy industry own use - gas	28.8	1.1	3.5	54.7
Non-specified other - gas	19.0	-	2.3	57.0
Road - gas	15.2	-	1.8	58.8
Residential - oil	15.1	24.8	1.8	60.6
<i>Memo: total CO₂ from fuel combustion</i>	<i>563.4</i>	<i>171.3</i>	<i>67.7</i>	<i>67.7</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Iraq

Figure 1. CO₂ emissions by fuel

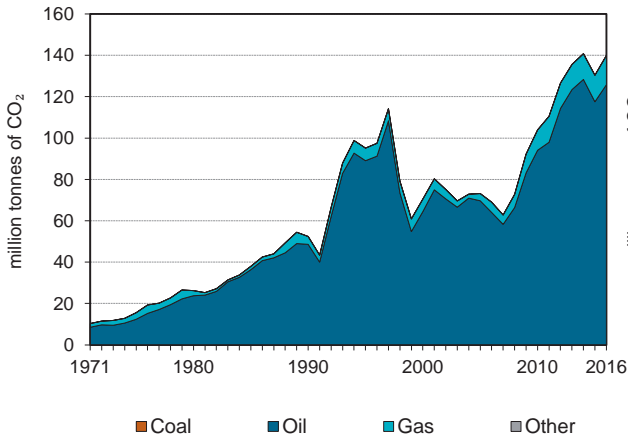


Figure 2. CO₂ emissions by sector

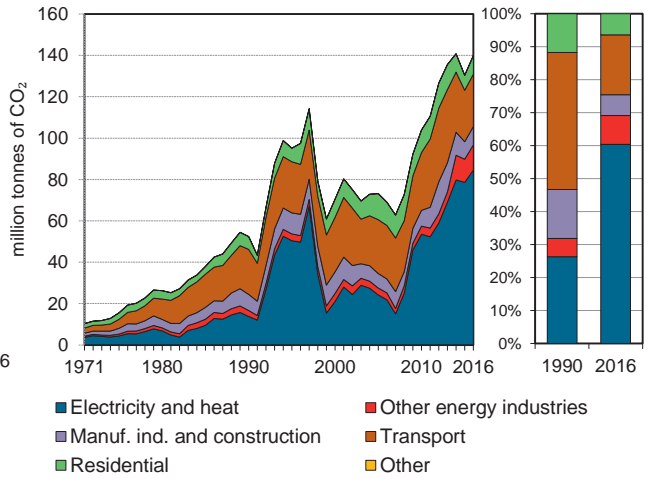


Figure 3. Electricity generation by fuel

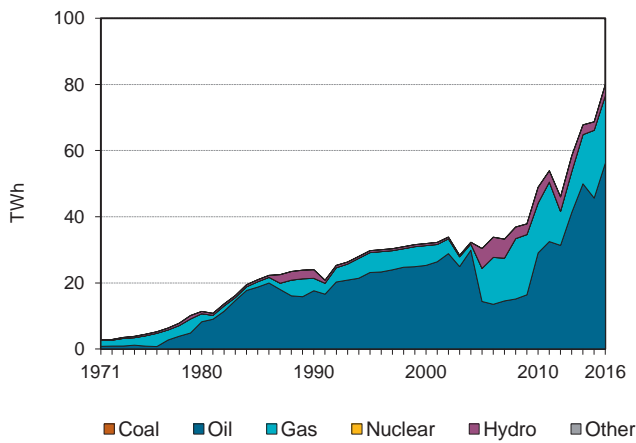


Figure 4. CO₂ from electricity generation: driving factors¹

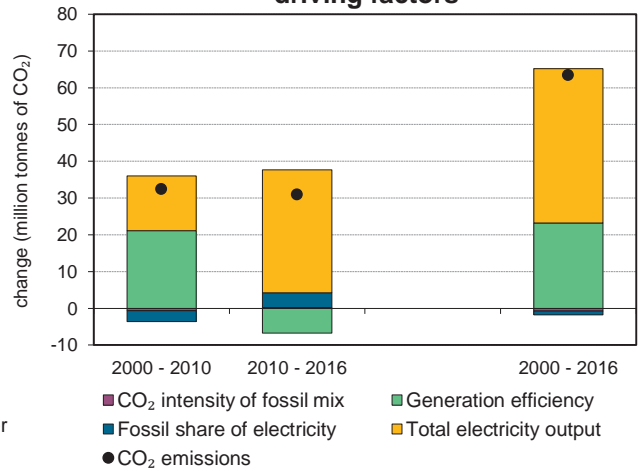


Figure 5. Changes in selected indicators

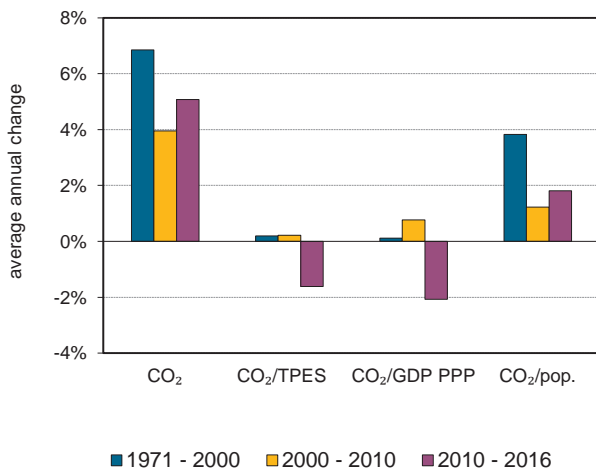
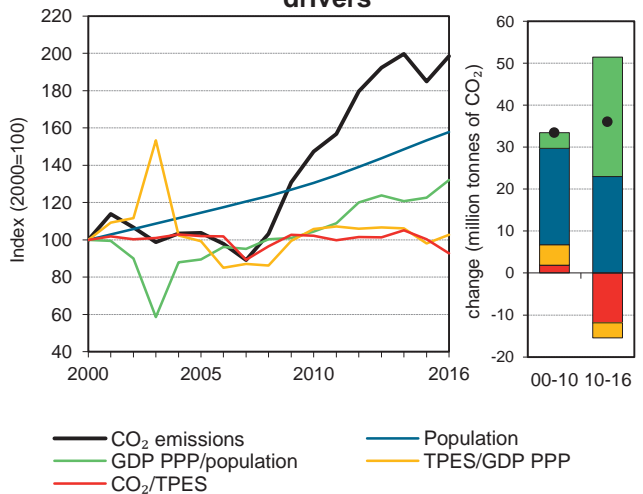


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Iraq

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	52.4	95.1	70.5	73.2	103.9	130.4	139.9	167%
Share of World CO ₂ from fuel combustion	0.3%	0.5%	0.3%	0.3%	0.3%	0.4%	0.4%	
TPES (PJ)	839	1 406	1 087	1 107	1 568	2 004	2 328	177%
GDP (billion 2010 USD)	71.3	46.9	101.6	104.2	138.5	190.9	211.9	197%
GDP PPP (billion 2010 USD)	197.2	129.9	281.1	288.3	383.3	528.3	586.4	197%
Population (millions)	17.5	20.2	23.6	27.0	30.8	36.1	37.2	113%
CO ₂ / TPES (tCO ₂ per TJ)	62.5	67.7	64.9	66.1	66.3	65.1	60.1	-4%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.74	2.0	0.7	0.7	0.8	0.7	0.7	-10%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.27	0.7	0.3	0.3	0.3	0.2	0.2	-10%
CO ₂ / population (tCO ₂ per capita)	3	4.7	3.0	2.7	3.4	3.6	3.8	25%
Share of electricity output from fossil fuels	89%	98%	98%	80%	90%	96%	96%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	575	1694	661	796	1095	1145	1056	84%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	182	135	140	198	249	267	167%
Population index	100	116	135	155	176	207	213	113%
GDP PPP per population index	100	57	106	95	110	130	140	40%
Energy intensity index - TPES / GDP PPP	100	254	91	90	96	89	93	-7%
Carbon intensity index - CO ₂ / TPES	100	108	104	106	106	104	96	-4%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	125.8	14.1	-	139.9	167%
Electricity and heat generation	-	73.1	11.4	-	84.5	513%
Other energy industry own use	-	12.2	-	-	12.2	325%
Manufacturing industries and construction	-	6.1	2.7	-	8.9	14%
Transport	-	25.3	-	-	25.3	16%
<i>of which: road</i>	-	25.3	-	-	25.3	16%
Other	-	9.0	-	-	9.0	45%
<i>of which: residential</i>	-	9.0	-	-	9.0	45%
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	0.9	-	-	0.9	118%
<i>Memo: international aviation bunkers</i>	-	2.1	-	-	2.1	112%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - oil	73.1	11.9	28.6	28.6
Road - oil	25.3	21.8	9.9	38.5
Other energy industry own use - oil	12.2	2.9	4.8	43.3
Main activity prod. elec. and heat - gas	11.4	1.9	4.5	47.8
Residential - oil	9.0	6.2	3.5	51.3
Manufacturing industries - oil	6.1	5.9	2.4	53.7
Manufacturing industries - gas	2.7	1.9	1.1	54.7
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	<i>139.9</i>	<i>52.4</i>	<i>54.7</i>	<i>54.7</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Ireland

Figure 1. CO₂ emissions by fuel

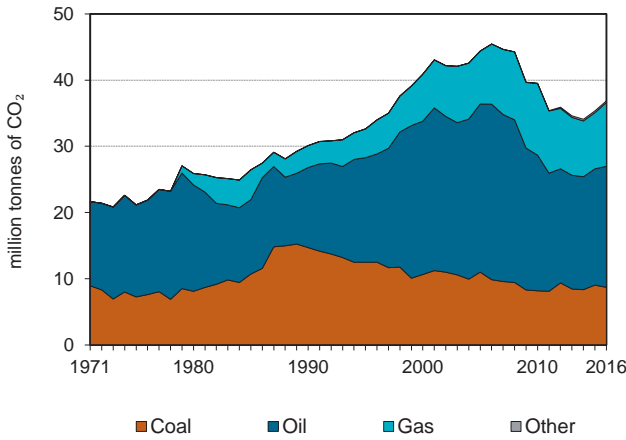


Figure 2. CO₂ emissions by sector

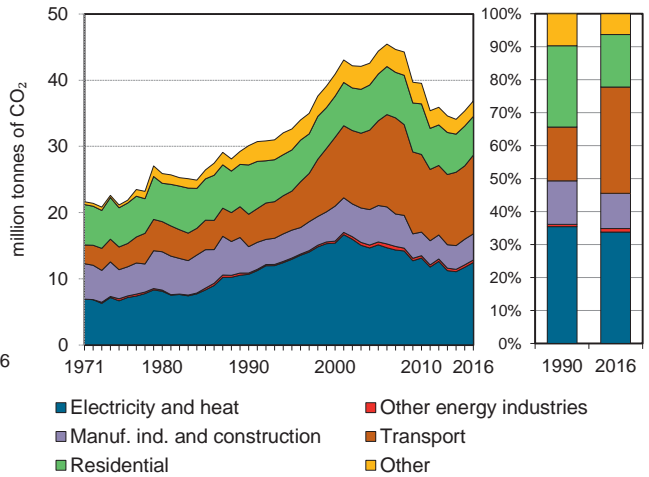


Figure 3. Electricity generation by fuel

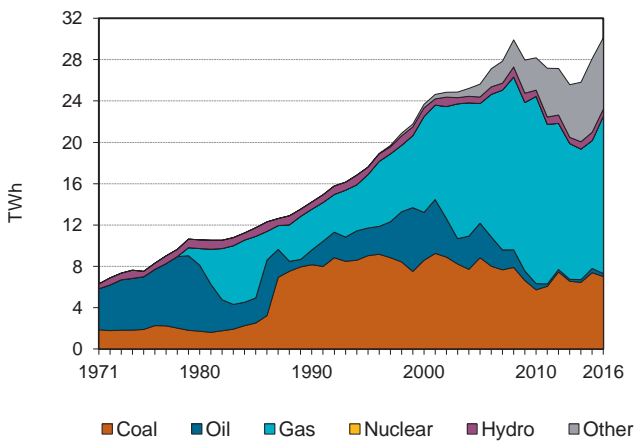


Figure 4. CO₂ from electricity generation: driving factors¹

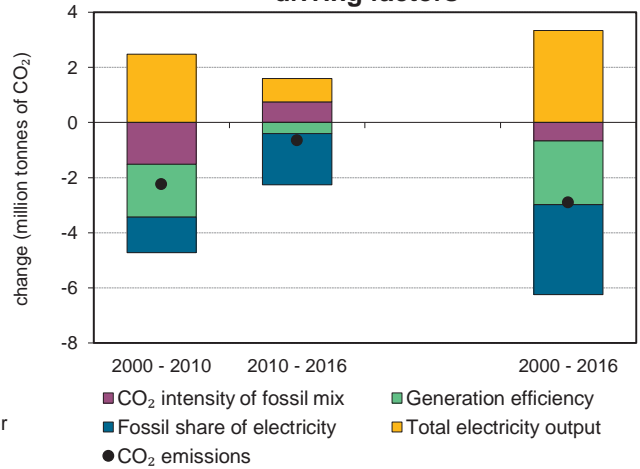


Figure 5. Changes in selected indicators

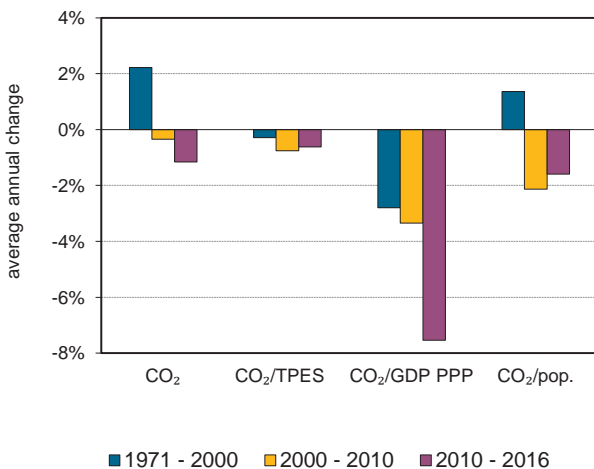
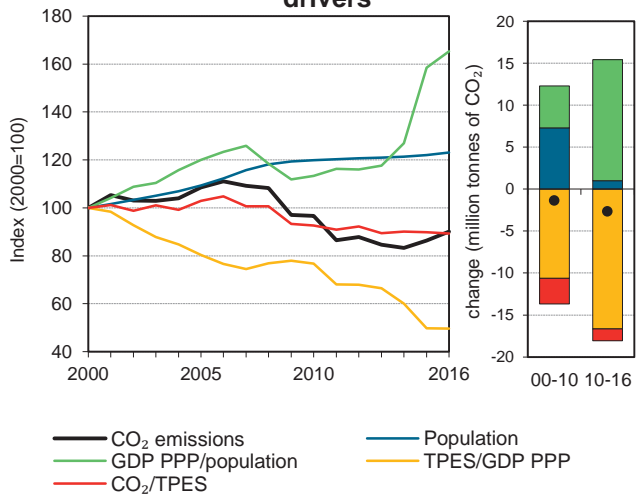


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Ireland

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	30.1	32.6	40.9	44.4	39.5	35.4	36.9	22%
Share of World CO ₂ from fuel combustion	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	
TPES (PJ)	415	446	578	609	602	556	583	41%
GDP (billion 2010 USD)	83.3	104.5	163.4	214.3	222.0	316.1	332.4	299%
GDP PPP (billion 2010 USD)	74.1	93.0	145.4	190.7	197.4	281.2	295.7	299%
Population (millions)	3.5	3.6	3.8	4.2	4.6	4.6	4.7	34%
CO ₂ / TPES (tCO ₂ per TJ)	72.6	73.2	70.8	72.9	65.6	63.6	63.2	-13%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.36	0.3	0.3	0.2	0.2	0.1	0.1	-69%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.41	0.4	0.3	0.2	0.2	0.1	0.1	-69%
CO ₂ / population (tCO ₂ per capita)	8.6	9.1	10.8	10.7	8.7	7.6	7.9	-8%
Share of electricity output from fossil fuels	95%	96%	95%	93%	87%	72%	75%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	750	736	650	590	466	418	413	-45%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	108	136	147	131	117	122	22%
Population index	100	103	109	119	130	132	134	34%
GDP PPP per population index	100	122	181	217	205	287	299	199%
Energy intensity index - TPES / GDP PPP	100	86	71	57	55	35	35	-65%
Carbon intensity index - CO ₂ / TPES	100	101	98	100	90	88	87	-13%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	8.7	18.3	9.6	0.3	36.9	22%
Electricity and heat generation	6.7	0.2	5.5	0.1	12.5	17%
Other energy industry own use	0.1	0.3	-	-	0.4	103%
Manufacturing industries and construction	0.4	1.6	1.8	0.2	4.0	-1%
Transport	-	11.9	0.0	-	11.9	143%
<i>of which: road</i>	-	11.5	0.0	-	11.5	149%
Other	1.5	4.3	2.4	-	8.2	-21%
<i>of which: residential</i>	1.5	3.0	1.3	-	5.8	-21%
<i>of which: services</i>	-	0.7	1.1	-	1.8	-21%
<i>Memo: international marine bunkers</i>	-	0.5	-	-	0.5	729%
<i>Memo: international aviation bunkers</i>	-	2.5	-	-	2.5	142%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	11.5	4.6	19.0	19.0
Main activity prod. elec. and heat - coal	6.6	7.5	11.0	30.0
Main activity prod. elec. and heat - gas	4.8	1.9	8.0	38.0
Residential - oil	3.0	1.2	5.0	42.9
Manufacturing industries - gas	1.8	0.8	2.9	45.9
Manufacturing industries - oil	1.6	2.2	2.6	48.5
Residential - coal	1.5	6.0	2.5	51.0
Residential - gas	1.3	0.3	2.2	53.2
Non-specified other - oil	1.3	2.6	2.1	55.3
<i>Memo: total CO₂ from fuel combustion</i>	36.9	30.1	60.9	60.9

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Israel

Figure 1. CO₂ emissions by fuel

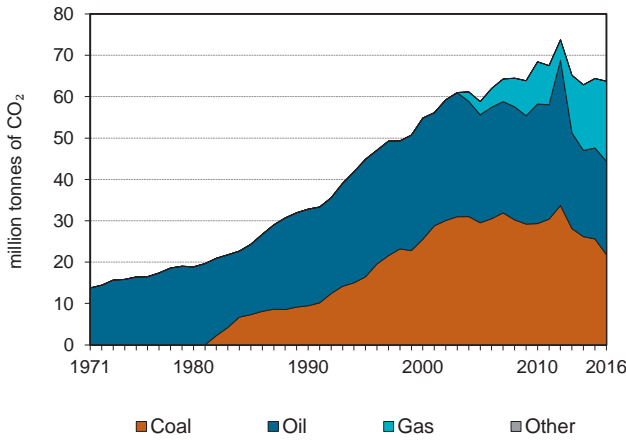


Figure 2. CO₂ emissions by sector

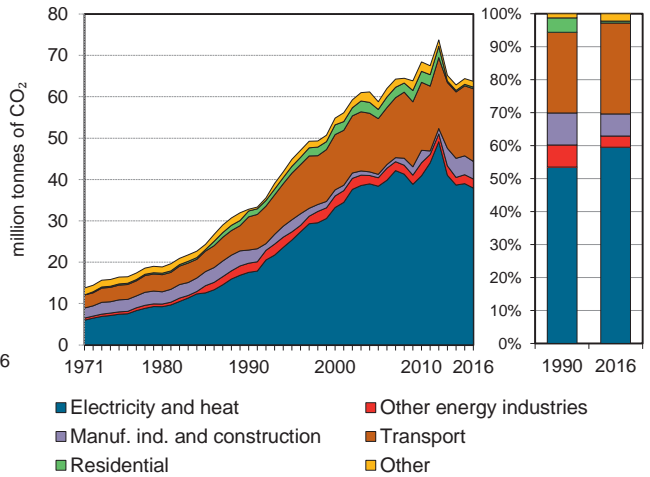


Figure 3. Electricity generation by fuel

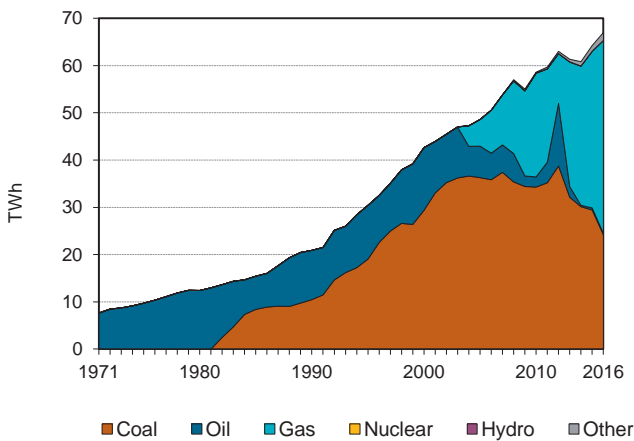


Figure 4. CO₂ from electricity generation: driving factors¹

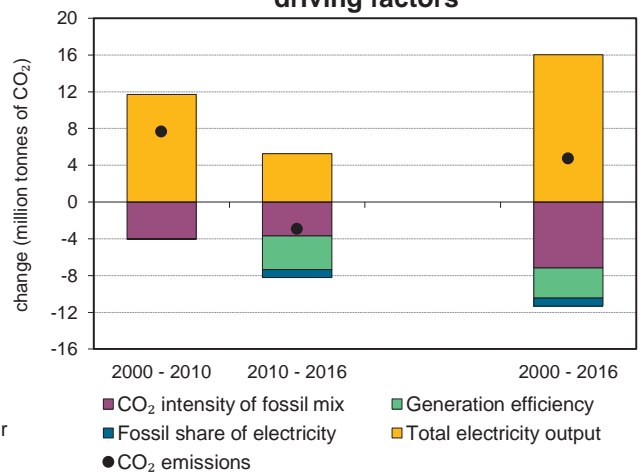


Figure 5. Changes in selected indicators

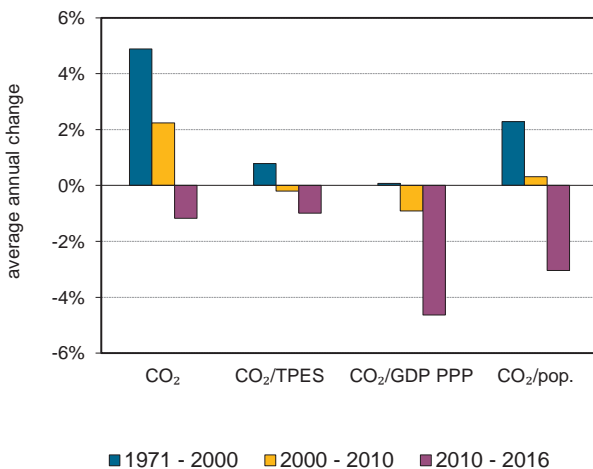
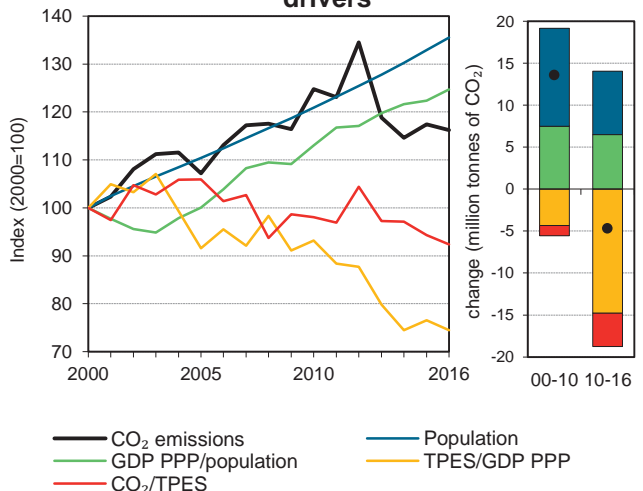


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Israel

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	32.8	44.9	54.8	58.8	68.4	64.4	63.7	94%
Share of World CO ₂ from fuel combustion	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	
TPES (PJ)	480	649	763	772	971	950	961	100%
GDP (billion 2010 USD)	95.5	132.1	171.0	188.9	233.6	278.0	289.0	203%
GDP PPP (billion 2010 USD)	89.8	124.4	160.9	177.8	219.9	261.6	272.0	203%
Population (millions)	4.7	5.5	6.3	7.0	7.6	8.4	8.5	83%
CO ₂ / TPES (tCO ₂ per TJ)	68.4	69.1	71.8	76.1	70.4	67.8	66.4	-3%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.34	0.3	0.3	0.3	0.3	0.2	0.2	-36%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.37	0.4	0.3	0.3	0.3	0.2	0.2	-36%
CO ₂ / population (tCO ₂ per capita)	7	8.1	8.7	8.4	9.0	7.7	7.5	6%
Share of electricity output from fossil fuels	100%	100%	100%	100%	100%	98%	98%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	840	834	779	790	698	607	566	-33%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	137	167	179	209	196	194	94%
Population index	100	119	135	149	164	180	183	83%
GDP PPP per population index	100	116	132	132	150	162	165	65%
Energy intensity index - TPES / GDP PPP	100	98	89	81	83	68	66	-34%
Carbon intensity index - CO ₂ / TPES	100	101	105	111	103	99	97	-3%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	21.9		22.5	19.3		63.7 94%
Electricity and heat generation	21.6		0.2	16.0		37.9 116%
Other energy industry own use	-		1.8	0.4		2.2 -1%
Manufacturing industries and construction	0.2		1.3	2.7		4.3 34%
Transport	-		17.6	-		17.6 119%
<i>of which: road</i>	-		17.5	-		17.5 119%
Other	0.0		1.6	0.2		1.8 -2%
<i>of which: residential</i>	-		0.4	-		0.4 -73%
<i>of which: services</i>	-		0.4	-		0.4 x
<i>Memo: international marine bunkers</i>	-		0.5	-		0.5 26%
<i>Memo: international aviation bunkers</i>	-		2.9	-		2.9 81%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	21.5	9.4	25.9	25.9
Road - oil	17.5	8.0	21.1	47.0
Main activity prod. elec. and heat - gas	14.8	-	17.8	64.8
Manufacturing industries - gas	2.7	0.0	3.3	68.1
Other energy industry own use - oil	1.8	2.2	2.2	70.2
Manufacturing industries - oil	1.3	3.1	1.6	71.9
Unallocated autoproducers - gas	1.3	-	1.5	73.4
Non-specified other - oil	1.2	0.4	1.5	74.8
Other energy industry own use - gas	0.4	-	0.5	75.3
<i>Memo: total CO₂ from fuel combustion</i>	63.7	32.8	76.9	76.9

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Italy

Figure 1. CO₂ emissions by fuel

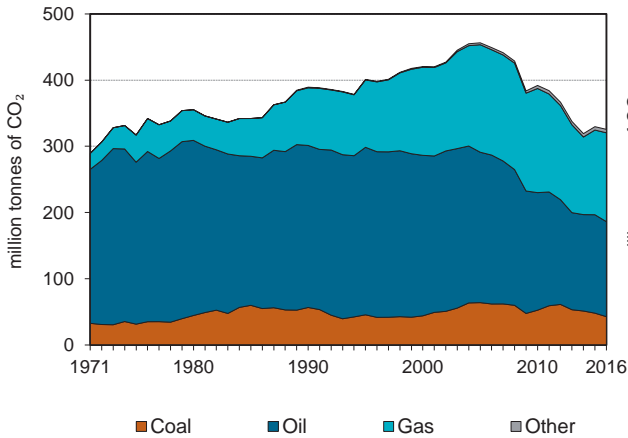


Figure 2. CO₂ emissions by sector

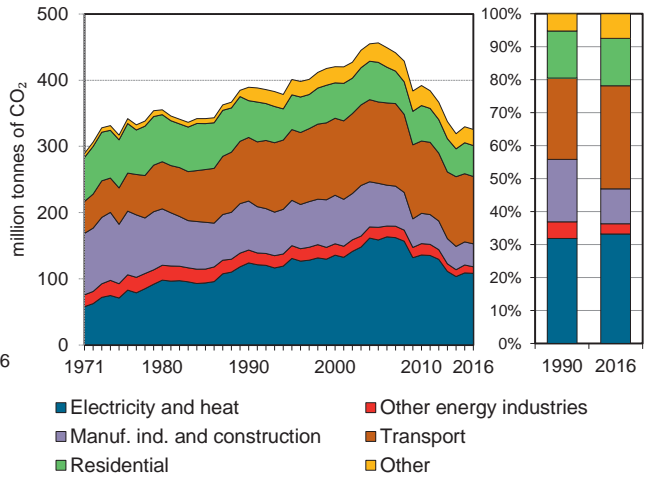


Figure 3. Electricity generation by fuel

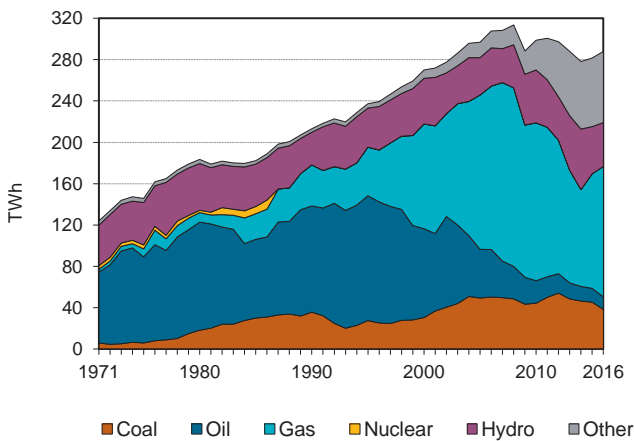


Figure 4. CO₂ from electricity generation: driving factors¹

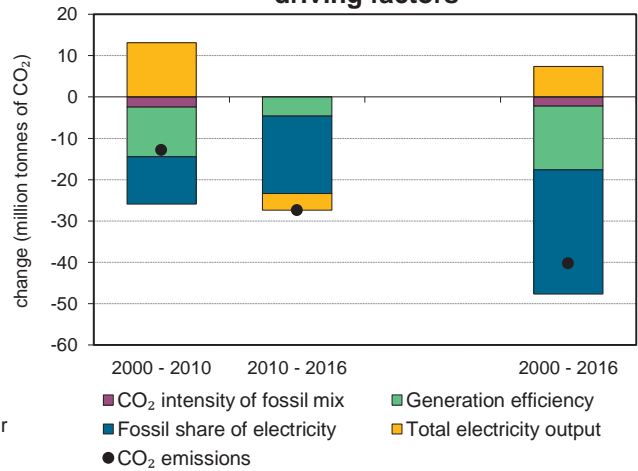


Figure 5. Changes in selected indicators

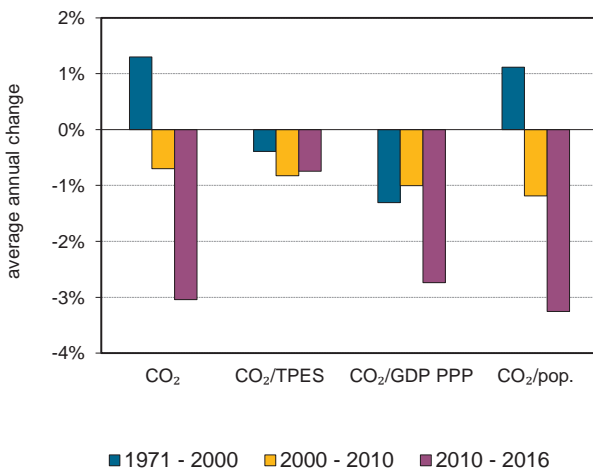
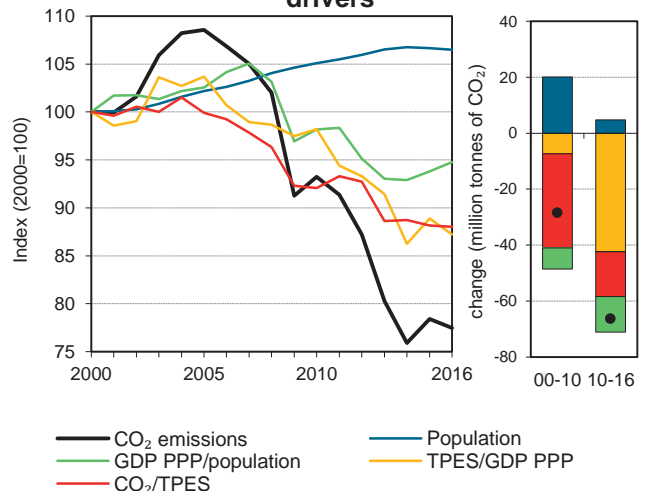


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Italy

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	389.4	401.1	420.4	456.4	392.0	329.7	325.7	-16%
Share of World CO ₂ from fuel combustion	1.9%	1.9%	1.8%	1.7%	1.3%	1.0%	1.0%	
TPES (PJ)	6136	6 663	7 182	7 803	7 274	6 387	6 321	3%
GDP (billion 2010 USD)	1749.2	1 866.2	2 060.2	2 158.7	2 125.1	2 062.9	2 080.6	19%
GDP PPP (billion 2010 USD)	1711.4	1 825.9	2 015.8	2 112.1	2 079.2	2 016.5	2 033.8	19%
Population (millions)	56.7	56.8	56.9	58.2	59.8	60.7	60.6	7%
CO ₂ / TPES (tCO ₂ per TJ)	63.5	60.2	58.5	58.5	53.9	51.6	51.5	-19%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.22	0.2	0.2	0.2	0.2	0.2	0.2	-30%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.23	0.2	0.2	0.2	0.2	0.2	0.2	-30%
CO ₂ / population (tCO ₂ per capita)	6.9	7.1	7.4	7.8	6.6	5.4	5.4	-22%
Share of electricity output from fossil fuels	84%	82%	81%	83%	74%	61%	62%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	582	551	503	491	410	342	331	-43%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	103	108	117	101	85	84	-16%
Population index	100	100	100	103	105	107	107	7%
GDP PPP per population index	100	106	117	120	115	110	111	11%
Energy intensity index - TPES / GDP PPP	100	102	99	103	98	88	87	-13%
Carbon intensity index - CO ₂ / TPES	100	95	92	92	85	81	81	-19%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	42.7	143.5	134.2	5.2	325.7	-16%
Electricity and heat generation	38.4	12.8	53.4	3.6	108.2	-13%
Other energy industry own use	0.0	7.2	2.8	-	9.9	-49%
Manufacturing industries and construction	4.2	9.2	19.6	1.7	34.7	-53%
Transport	-	99.1	2.6	-	101.7	6%
<i>of which: road</i>	-	93.9	2.1	-	96.0	4%
Other	-	15.3	55.8	-	71.1	-6%
<i>of which: residential</i>	-	6.6	40.2	-	46.7	-16%
<i>of which: services</i>	-	1.5	15.4	-	16.9	48%
<i>Memo: international marine bunkers</i>	-	7.1	-	-	7.1	-16%
<i>Memo: international aviation bunkers</i>	-	9.9	-	-	9.9	117%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	93.9	91.9	22.7	22.7
Main activity prod. elec. and heat - gas	45.4	16.2	11.0	33.7
Residential - gas	40.2	26.6	9.7	43.4
Main activity prod. elec. and heat - coal	32.5	28.2	7.9	51.2
Manufacturing industries - gas	19.6	30.5	4.7	56.0
Non-specified other - gas	15.7	9.9	3.8	59.8
Main activity prod. elec. and heat - oil	11.4	63.9	2.8	62.5
Manufacturing industries - oil	9.2	27.2	2.2	64.7
Non-specified other - oil	8.7	10.3	2.1	66.8
<i>Memo: total CO₂ from fuel combustion</i>	<i>325.7</i>	<i>389.4</i>	<i>78.7</i>	<i>78.7</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Jamaica

Figure 1. CO₂ emissions by fuel

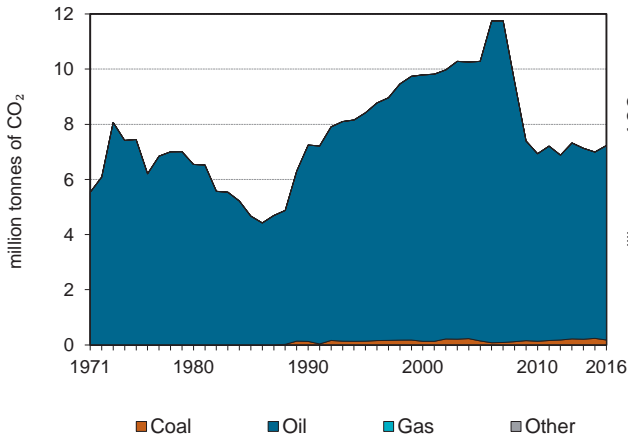


Figure 2. CO₂ emissions by sector

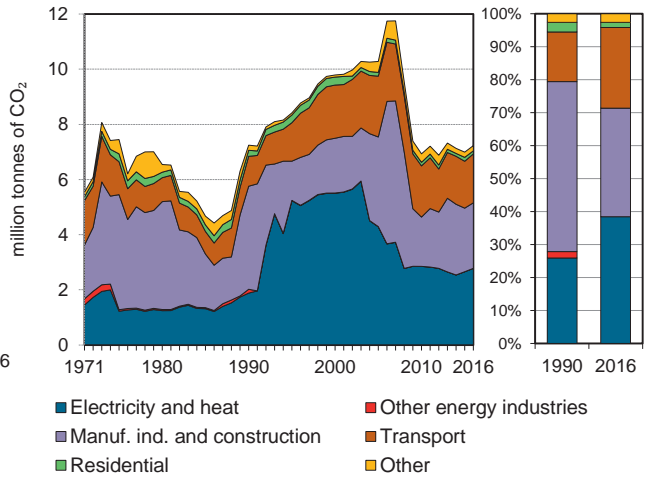


Figure 3. Electricity generation by fuel

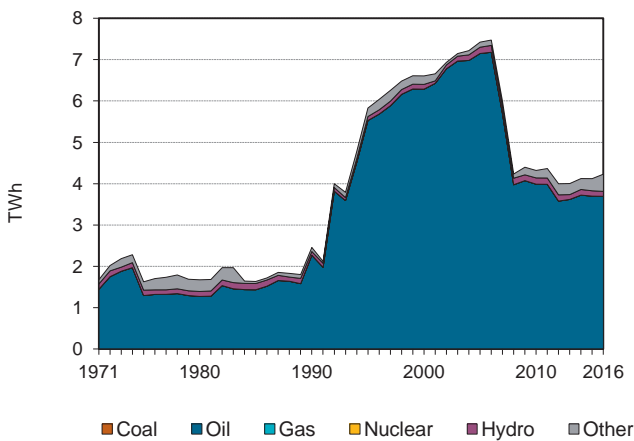


Figure 4. CO₂ from electricity generation: driving factors¹

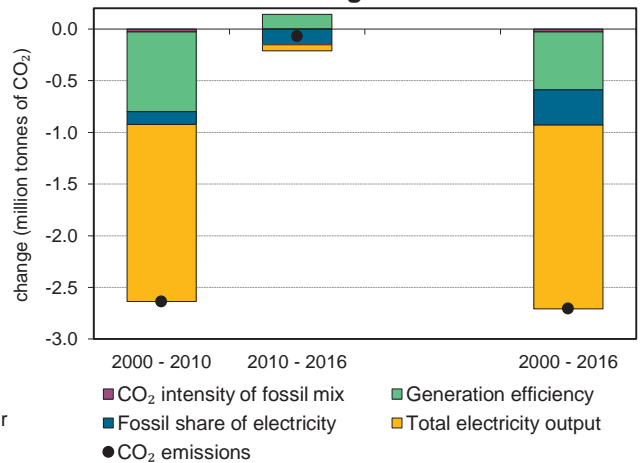


Figure 5. Changes in selected indicators

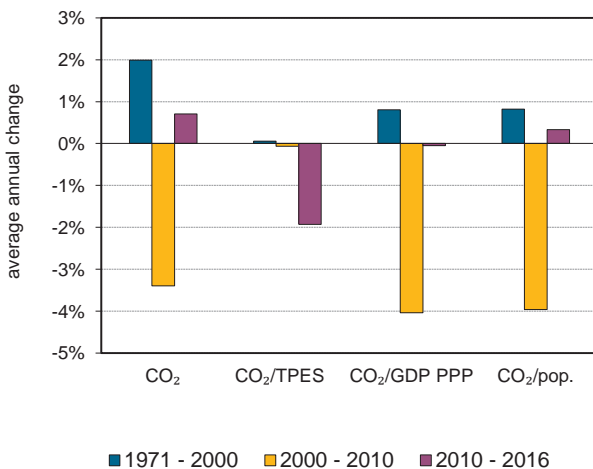
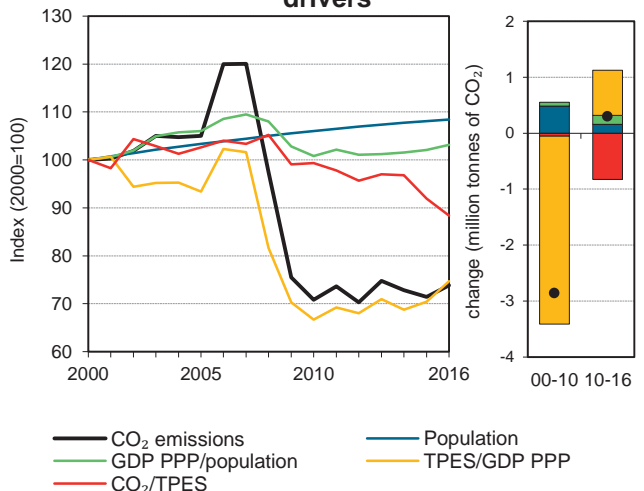


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Jamaica

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	7.3	8.4	9.8	10.3	6.9	7.0	7.2	0%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	110	126	146	150	104	114	122	11%
GDP (billion 2010 USD)	10.3	12.6	12.3	13.5	13.2	13.6	13.8	34%
GDP PPP (billion 2010 USD)	17.3	21.0	20.6	22.6	22.1	22.8	23.1	33%
Population (millions)	2.4	2.5	2.7	2.7	2.8	2.9	2.9	19%
CO ₂ / TPES (tCO ₂ per TJ)	66	66.8	66.9	68.7	66.5	61.5	59.1	-10%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.7	0.7	0.8	0.8	0.5	0.5	0.5	-25%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.42	0.4	0.5	0.5	0.3	0.3	0.3	-25%
CO ₂ / population (tCO ₂ per capita)	3	3.3	3.7	3.7	2.5	2.4	2.5	-16%
Share of electricity output from fossil fuels	92%	95%	95%	96%	92%	90%	87%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	765	897	833	578	660	644	657	-14%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	116	135	142	96	97	100	0%
Population index	100	105	110	113	116	118	119	19%
GDP PPP per population index	100	116	109	115	110	111	112	12%
Energy intensity index - TPES / GDP PPP	100	95	112	104	75	79	83	-17%
Carbon intensity index - CO ₂ / TPES	100	101	101	104	101	93	90	-10%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.2	7.1	-	-	7.2	-0%
Electricity and heat generation	-	2.8	-	-	2.8	48%
Other energy industry own use	-	-	-	-	-	-100%
Manufacturing industries and construction	0.2	2.2	-	-	2.4	-36%
Transport	-	1.8	-	-	1.8	64%
<i>of which: road</i>	-	1.8	-	-	1.8	70%
Other	-	0.3	-	-	0.3	-26%
<i>of which: residential</i>	-	0.1	-	-	0.1	-49%
<i>of which: services</i>	-	0.2	-	-	0.2	131%
<i>Memo: international marine bunkers</i>	-	0.7	-	-	0.7	576%
<i>Memo: international aviation bunkers</i>	-	0.6	-	-	0.6	29%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Manufacturing industries - oil	2.2	3.6	22.4	22.4
Road - oil	1.8	1.0	18.1	40.5
Main activity prod. elec. and heat - oil	1.5	1.9	15.6	56.1
Unallocated autoproducers - oil	1.2	-	12.7	68.8
Non-specified other - oil	0.2	0.2	1.9	70.8
Manufacturing industries - coal	0.2	0.1	1.8	72.6
Residential - oil	0.1	0.2	1.1	73.7
Other transport - oil	0.0	0.0	0.0	73.7
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	<i>7.2</i>	<i>7.3</i>	<i>73.7</i>	<i>73.7</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Japan

Figure 1. CO₂ emissions by fuel

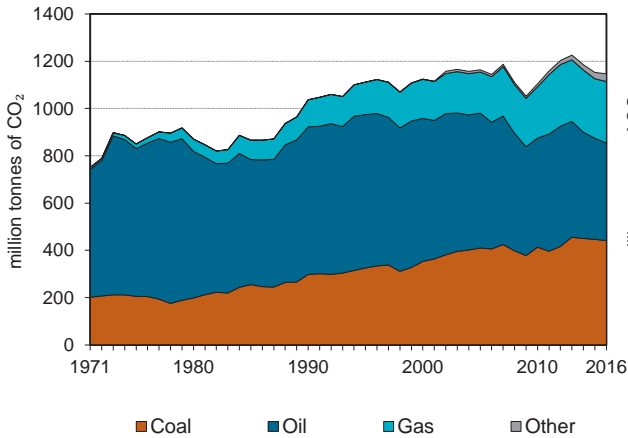


Figure 2. CO₂ emissions by sector

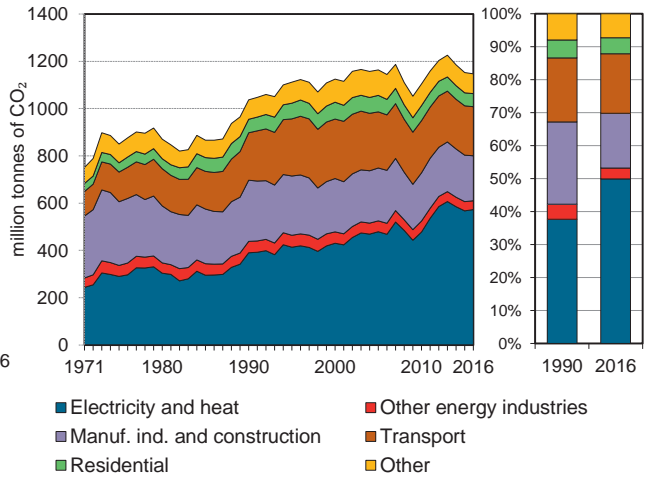


Figure 3. Electricity generation by fuel

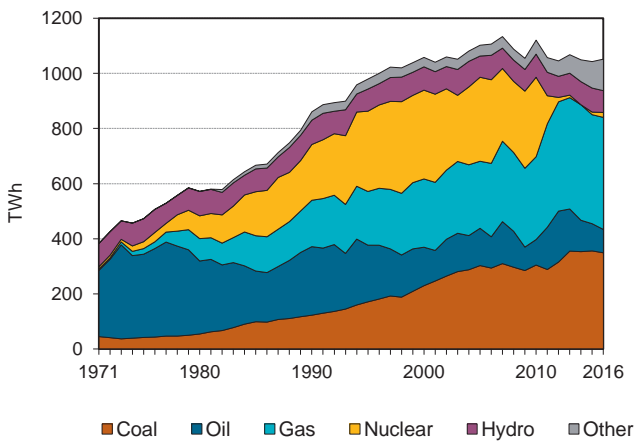


Figure 4. CO₂ from electricity generation: driving factors¹

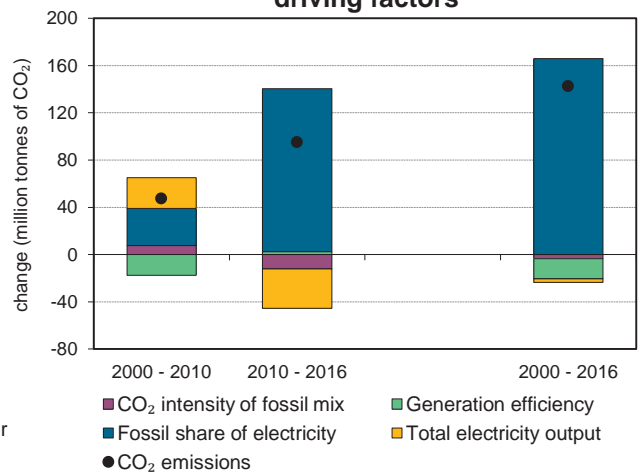


Figure 5. Changes in selected indicators

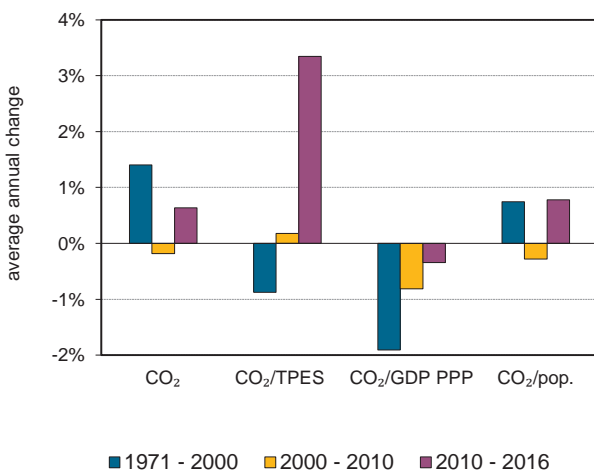
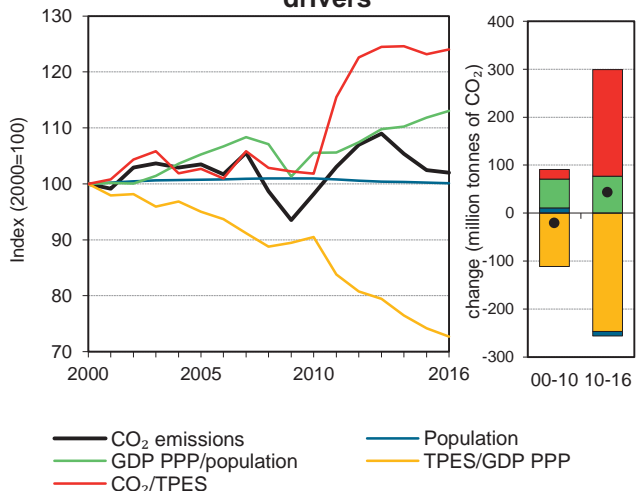


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Japan

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	1037.1	1 111.9	1 124.7	1 163.7	1 104.2	1 152.6	1 147.1	11%
Share of World CO ₂ from fuel combustion	5.1%	5.2%	4.8%	4.3%	3.6%	3.6%	3.6%	
TPES (PJ)	18347	20 661	21 668	21 838	20 895	18 025	17 820	-3%
GDP (billion 2010 USD)	4703.6	5 063.8	5 348.9	5 672.3	5 700.1	5 996.4	6 052.7	29%
GDP PPP (billion 2010 USD)	3698.9	3 982.1	4 206.3	4 460.6	4 482.5	4 715.5	4 759.8	29%
Population (millions)	123.6	125.4	126.8	127.8	128.0	127.1	127.0	3%
CO ₂ / TPES (tCO ₂ per TJ)	56.5	53.8	51.9	53.3	52.8	63.9	64.4	14%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.22	0.2	0.2	0.2	0.2	0.2	0.2	-14%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.28	0.3	0.3	0.3	0.2	0.2	0.2	-14%
CO ₂ / population (tCO ₂ per capita)	8.4	8.9	8.9	9.1	8.6	9.1	9.0	8%
Share of electricity output from fossil fuels	63%	58%	58%	62%	63%	83%	82%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	453	422	406	434	425	543	544	20%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	107	108	112	106	111	111	11%
Population index	100	101	103	103	104	103	103	3%
GDP PPP per population index	100	106	111	117	117	124	125	25%
Energy intensity index - TPES / GDP PPP	100	105	104	99	94	77	75	-25%
Carbon intensity index - CO ₂ / TPES	100	95	92	94	93	113	114	14%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16	
CO₂ fuel combustion	441.0		412.4	260.9	32.8	1 147.1	11%
Electricity and heat generation	315.5		54.7	182.6	20.0	572.8	47%
Other energy industry own use	18.3		15.7	3.3	-	37.4	-22%
Manufacturing industries and construction	106.8		51.6	25.9	6.0	190.3	-26%
Transport	0.0		207.4	0.1	-	207.5	3%
<i>of which: road</i>	-		186.4	0.1	-	186.5	4%
Other	0.3		83.0	48.9	6.9	139.1	-0%
<i>of which: residential</i>	-		34.7	20.6	-	55.3	-3%
<i>of which: services</i>	0.3		34.4	28.3	1.8	64.9	2%
<i>Memo: international marine bunkers</i>	-		14.6	-	-	14.6	-18%
<i>Memo: international aviation bunkers</i>	-		20.1	-	-	20.1	49%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	258.0	103.5	19.9	19.9
Road - oil	186.4	179.0	14.3	34.2
Main activity prod. elec. and heat - gas	176.6	77.6	13.6	47.8
Manufacturing industries - coal	106.8	133.4	8.2	56.0
Unallocated autoproducers - coal	57.5	39.5	4.4	60.4
Manufacturing industries - oil	51.6	113.5	4.0	64.4
Non-specified other - oil	48.3	77.3	3.7	68.1
Main activity prod. elec. and heat - oil	40.4	137.4	3.1	71.2
Residential - oil	34.7	39.5	2.7	73.9
<i>Memo: total CO₂ from fuel combustion</i>	<i>1147.1</i>	<i>1037.1</i>	<i>88.3</i>	<i>88.3</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Jordan

Figure 1. CO₂ emissions by fuel

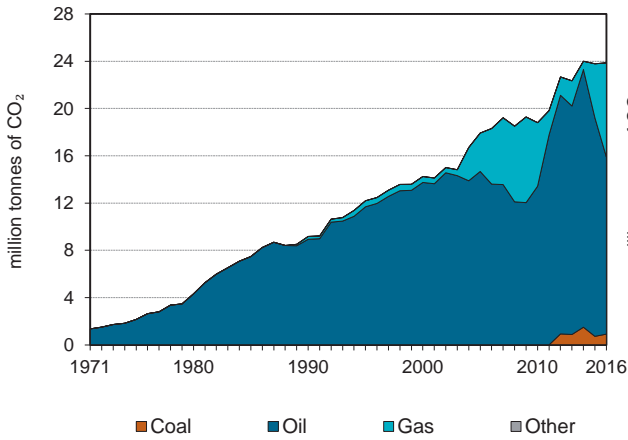


Figure 2. CO₂ emissions by sector

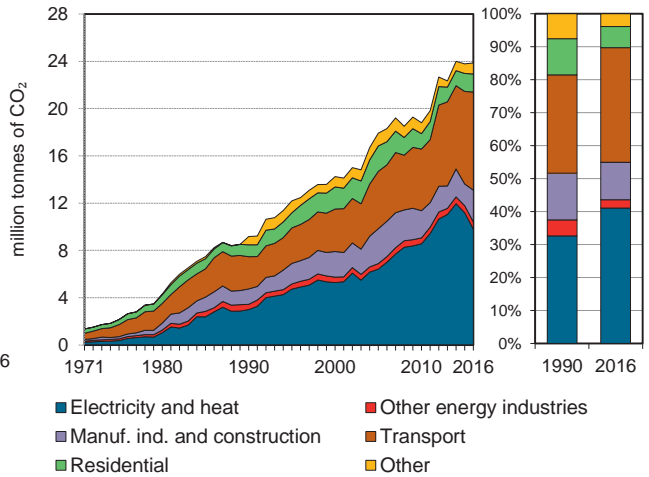


Figure 3. Electricity generation by fuel

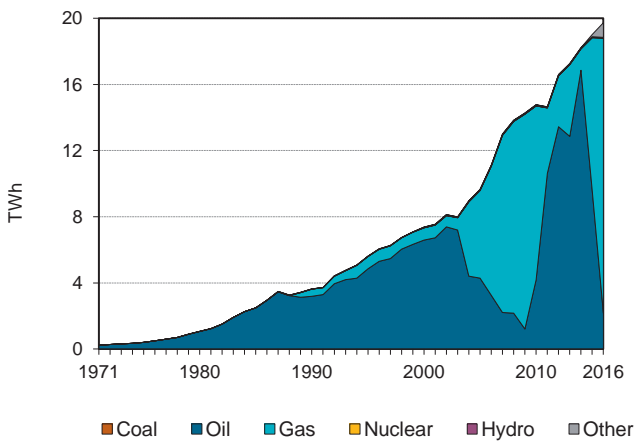


Figure 4. CO₂ from electricity generation: driving factors¹

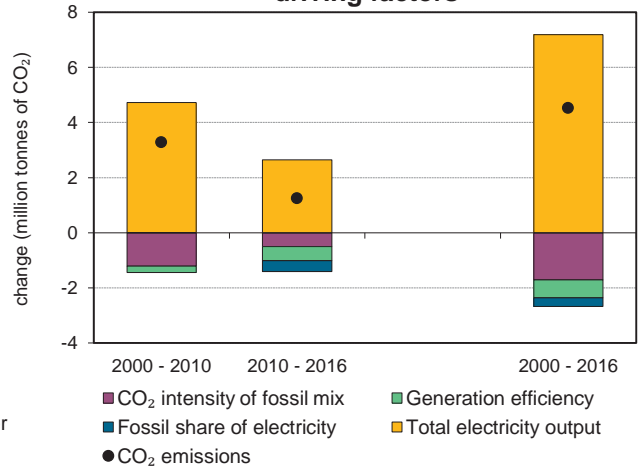


Figure 5. Changes in selected indicators

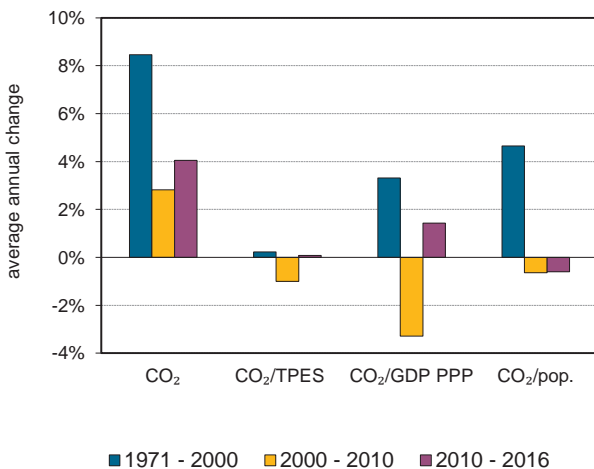
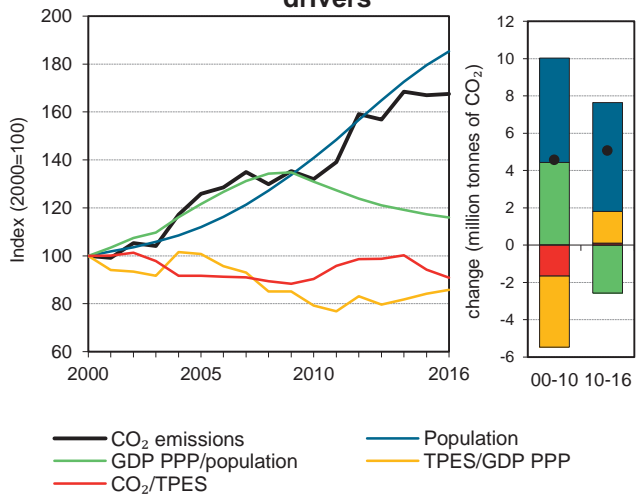


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Jordan

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	9.2	12.2	14.2	17.9	18.8	23.8	23.9	160%
Share of World CO ₂ from fuel combustion	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	
TPES (PJ)	137	180	204	280	297	361	376	174%
GDP (billion 2010 USD)	8.7	12.2	14.3	19.5	26.4	30.2	30.8	255%
GDP PPP (billion 2010 USD)	21.9	30.9	36.2	49.3	66.7	76.2	77.7	255%
Population (millions)	3.6	4.6	5.1	5.7	7.2	9.2	9.5	166%
CO ₂ / TPES (tCO ₂ per TJ)	66.9	67.7	69.9	64.1	63.2	65.9	63.5	-5%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.06	1.0	1.0	0.9	0.7	0.8	0.8	-27%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.42	0.4	0.4	0.4	0.3	0.3	0.3	-27%
CO ₂ / population (tCO ₂ per capita)	2.6	2.7	2.8	3.1	2.6	2.6	2.5	-2%
Share of electricity output from fossil fuels	100%	100%	99%	99%	100%	99%	95%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	824	842	716	665	580	588	497	-40%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	133	155	195	205	259	260	160%
Population index	100	128	143	160	202	257	266	166%
GDP PPP per population index	100	110	115	140	151	135	134	34%
Energy intensity index - TPES / GDP PPP	100	93	90	91	71	76	77	-23%
Carbon intensity index - CO ₂ / TPES	100	101	104	96	94	98	95	-5%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.9	15.0	8.0	-	23.9	160%
Electricity and heat generation	-	1.8	8.0	-	9.8	227%
Other energy industry own use	-	0.6	-	-	0.6	38%
Manufacturing industries and construction	0.9	1.8	-	-	2.7	107%
Transport	-	8.3	-	-	8.3	204%
<i>of which: road</i>	-	8.3	-	-	8.3	208%
Other	-	2.5	-	-	2.5	44%
<i>of which: residential</i>	-	1.5	-	-	1.5	52%
<i>of which: services</i>	-	0.4	-	-	0.4	954%
<i>Memo: international marine bunkers</i>	-	0.0	-	-	0.0	x
<i>Memo: international aviation bunkers</i>	-	1.2	-	-	1.2	73%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	8.3	2.7	26.7	26.7
Main activity prod. elec. and heat - gas	8.0	0.2	25.7	52.4
Manufacturing industries - oil	1.8	1.3	5.8	58.2
Residential - oil	1.5	1.0	4.9	63.1
Main activity prod. elec. and heat - oil	1.2	2.5	3.7	66.9
Non-specified other - oil	0.9	0.7	3.0	69.9
Manufacturing industries - coal	0.9	-	2.9	72.8
Unallocated autoproducers - oil	0.7	0.3	2.2	75.0
Other energy industry own use - oil	0.6	0.4	2.0	77.0
<i>Memo: total CO₂ from fuel combustion</i>	23.9	9.2	77.1	77.1

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Kazakhstan

Figure 1. CO₂ emissions by fuel

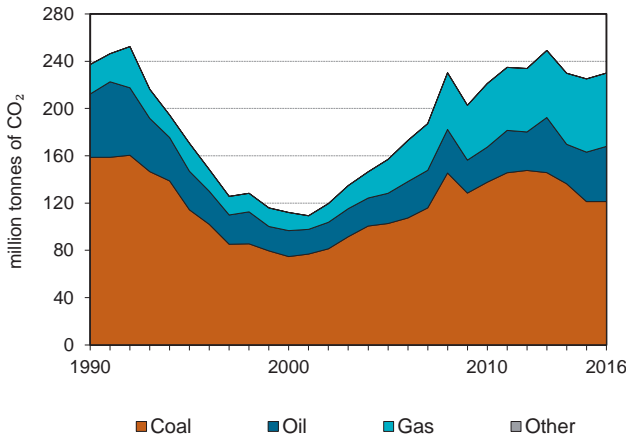


Figure 2. CO₂ emissions by sector

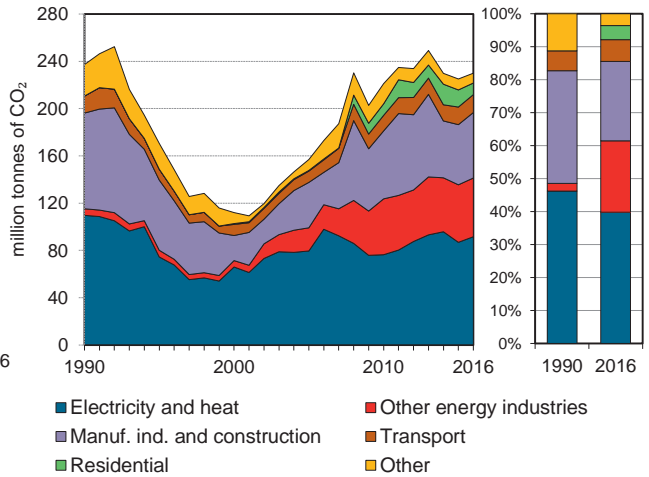


Figure 3. Electricity generation by fuel

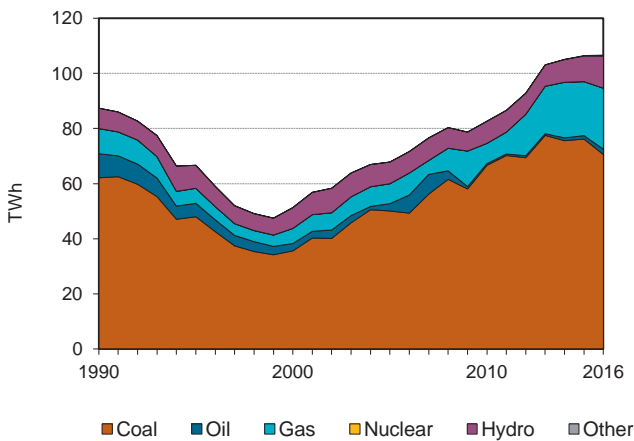


Figure 4. CO₂ from electricity generation: driving factors¹

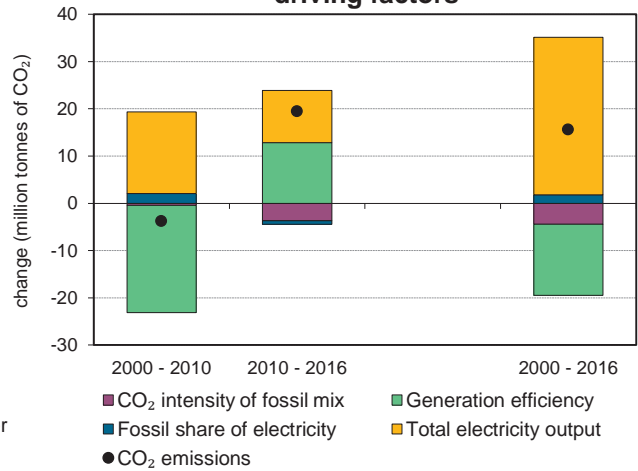


Figure 5. Changes in selected indicators

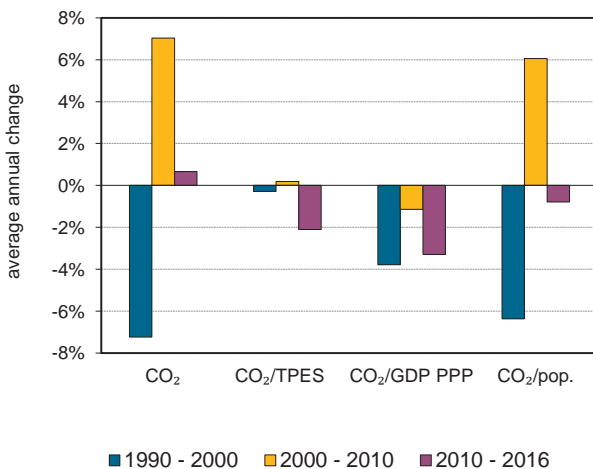
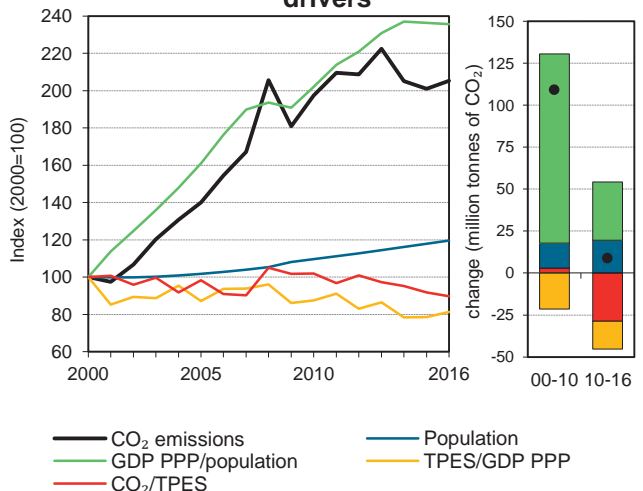


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Kazakhstan

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	237.3	170.5	112.0	156.9	221.1	225.1	230.0	-3%
Share of World CO ₂ from fuel combustion	1.2%	0.8%	0.5%	0.6%	0.7%	0.7%	0.7%	
TPES (PJ)	3075	2 187	1 494	2 130	2 894	3 270	3 418	11%
GDP (billion 2010 USD)	96.3	59.1	66.9	109.5	148.0	186.3	188.1	95%
GDP PPP (billion 2010 USD)	209	128.4	145.1	237.7	321.4	404.3	408.8	96%
Population (millions)	16.4	15.8	14.9	15.1	16.3	17.5	17.8	9%
CO ₂ / TPES (tCO ₂ per TJ)	77.2	78.0	75.0	73.7	76.4	68.8	67.3	-13%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	2.46	2.9	1.7	1.4	1.5	1.2	1.2	-50%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	1.14	1.3	0.8	0.7	0.7	0.6	0.6	-50%
CO ₂ / population (tCO ₂ per capita)	14.5	10.8	7.5	10.4	13.5	12.8	12.9	-11%
Share of electricity output from fossil fuels	92%	88%	85%	88%	90%	91%	89%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	621	632	743	608	416	414	505	-19%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	72	47	66	93	95	97	-3%
Population index	100	97	91	93	100	107	109	9%
GDP PPP per population index	100	63	76	123	154	180	180	80%
Energy intensity index - TPES / GDP PPP	100	116	70	61	61	55	57	-43%
Carbon intensity index - CO ₂ / TPES	100	101	97	95	99	89	87	-13%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	121.3	46.7	62.0	-	230.0	-3%
Electricity and heat generation	76.8	1.8	13.0	-	91.6	-16%
Other energy industry own use	1.5	5.9	42.2	-	49.7	795%
Manufacturing industries and construction	36.8	14.8	3.9	-	55.4	-32%
Transport	-	15.1	-	-	15.1	5%
<i>of which: road</i>	-	14.1	-	-	14.1	17%
Other	6.2	9.1	2.9	-	18.1	-32%
<i>of which: residential</i>	3.5	5.6	0.7	-	9.8	x
<i>of which: services</i>	2.2	2.0	2.2	-	6.4	+
<i>Memo: international marine bunkers</i>	-	0.5	-	-	0.5	x
<i>Memo: international aviation bunkers</i>	-	0.9	-	-	0.9	-65%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	76.8	95.4	24.5	24.5
Other energy industry own use - gas	42.2	3.2	13.5	38.0
Manufacturing industries - coal	36.8	63.3	11.7	49.8
Manufacturing industries - oil	14.8	17.7	4.7	54.5
Road - oil	14.1	12.1	4.5	59.0
Main activity prod. elec. and heat - gas	13.0	3.5	4.2	63.2
Other energy industry own use - oil	5.9	2.4	1.9	65.1
Residential - oil	5.6	-	1.8	66.9
Manufacturing industries - gas	3.9	-	1.2	68.1
<i>Memo: total CO₂ from fuel combustion</i>	<i>230.0</i>	<i>237.3</i>	<i>73.5</i>	<i>73.5</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Kenya

Figure 1. CO₂ emissions by fuel

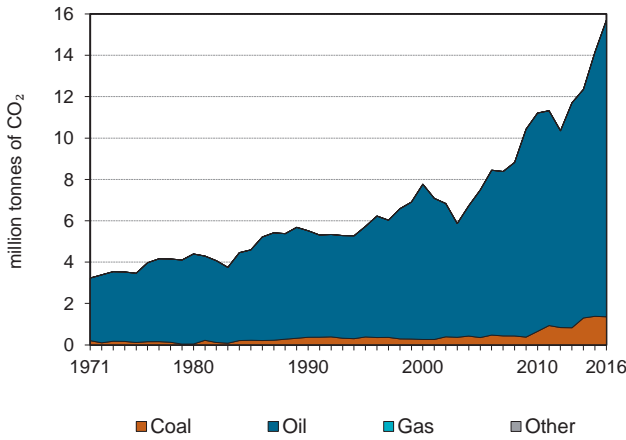


Figure 2. CO₂ emissions by sector

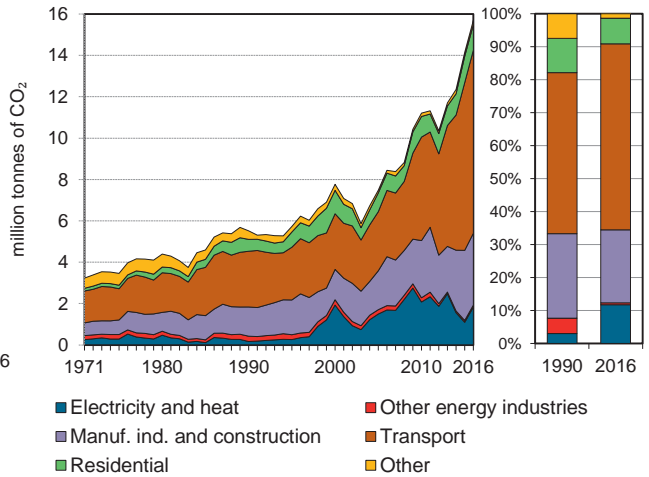


Figure 3. Electricity generation by fuel

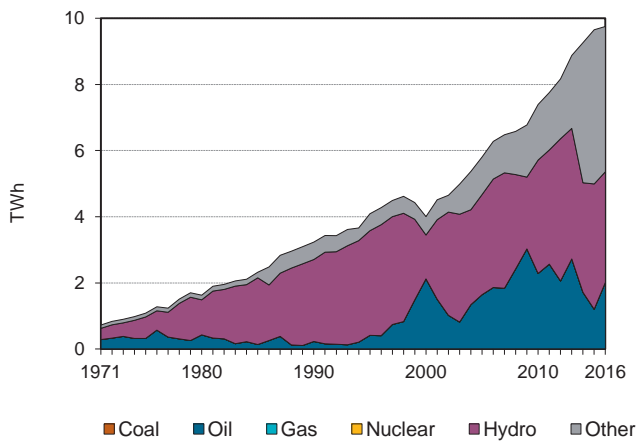


Figure 4. CO₂ from electricity generation: driving factors¹

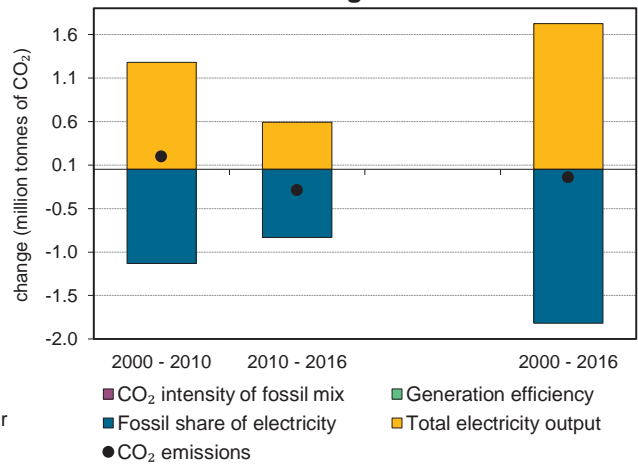


Figure 5. Changes in selected indicators

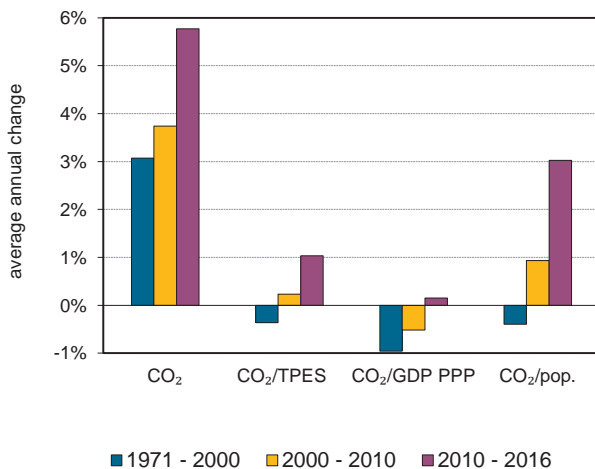
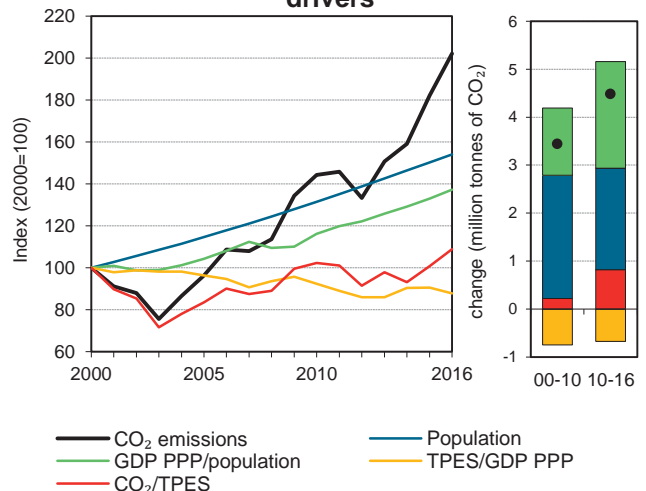


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Kenya

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	5.5	5.7	7.8	7.5	11.2	14.1	15.7	184%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	
TPES (PJ)	444	504	586	676	827	1 060	1 088	145%
GDP (billion 2010 USD)	21.8	23.6	26.2	31.3	40.0	52.3	55.4	155%
GDP PPP (billion 2010 USD)	54.6	59.1	65.7	78.5	100.3	131.2	138.9	155%
Population (millions)	23.4	27.3	31.5	36.0	41.4	47.2	48.5	107%
CO ₂ / TPES (tCO ₂ per TJ)	12.4	11.4	13.3	11.1	13.6	13.3	14.4	16%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.25	0.2	0.3	0.2	0.3	0.3	0.3	12%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	12%
CO ₂ / population (tCO ₂ per capita)	0.2	0.2	0.2	0.2	0.3	0.3	0.3	37%
Share of electricity output from fossil fuels	7%	10%	53%	28%	31%	13%	21%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	51	64	482	258	281	114	188	266%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	104	141	136	203	256	284	184%
Population index	100	117	134	154	177	202	207	107%
GDP PPP per population index	100	93	90	93	104	119	123	23%
Energy intensity index - TPES / GDP PPP	100	105	110	106	101	99	96	-4%
Carbon intensity index - CO ₂ / TPES	100	91	107	89	109	107	116	16%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	1.4	14.3	-	-	15.7	184%
Electricity and heat generation	-	1.8	-	-	1.8	+
Other energy industry own use	-	0.1	-	-	0.1	-64%
Manufacturing industries and construction	1.4	2.1	-	-	3.5	146%
Transport	-	8.9	-	-	8.9	229%
<i>of which: road</i>	-	8.7	-	-	8.7	240%
Other	-	1.4	-	-	1.4	46%
<i>of which: residential</i>	-	1.2	-	-	1.2	114%
<i>of which: services</i>	-	-	-	-	-	-100%
<i>Memo: international marine bunkers</i>	-	0.1	-	-	0.1	-75%
<i>Memo: international aviation bunkers</i>	-	2.0	-	-	2.0	135%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	8.7	2.6	11.0	11.0
Manufacturing industries - oil	2.1	1.0	2.7	13.7
Main activity prod. elec. and heat - oil	1.8	0.1	2.3	16.0
Manufacturing industries - coal	1.4	0.4	1.7	17.8
Residential - oil	1.2	0.6	1.6	19.3
Non-specified other - oil	0.2	0.4	0.3	19.6
Other transport - oil	0.2	0.1	0.2	19.8
Other energy industry own use - oil	0.1	0.3	0.1	19.9
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	<i>15.7</i>	<i>5.5</i>	<i>19.9</i>	<i>19.9</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Korea

Figure 1. CO₂ emissions by fuel

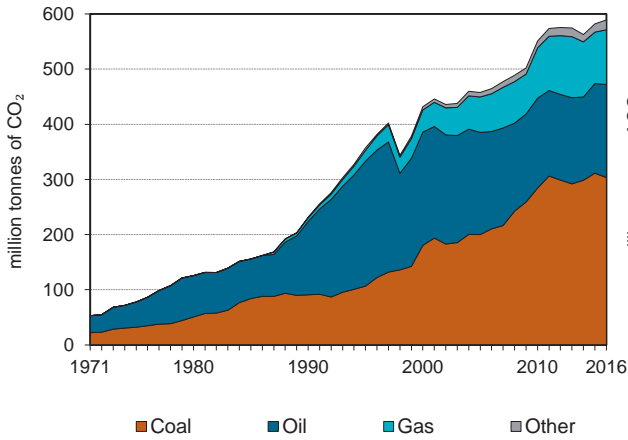


Figure 2. CO₂ emissions by sector

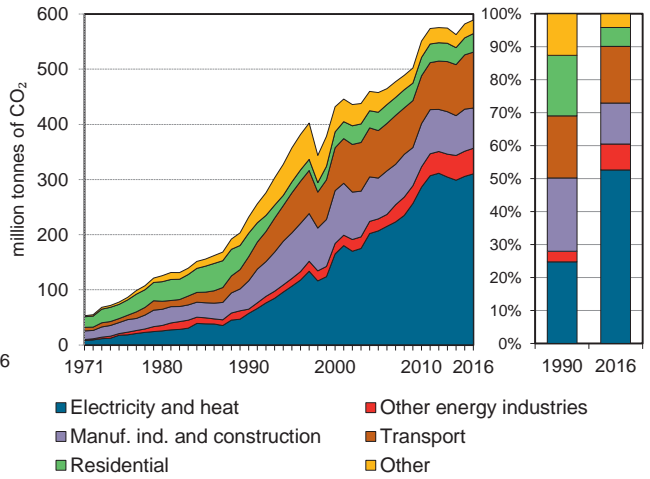


Figure 3. Electricity generation by fuel

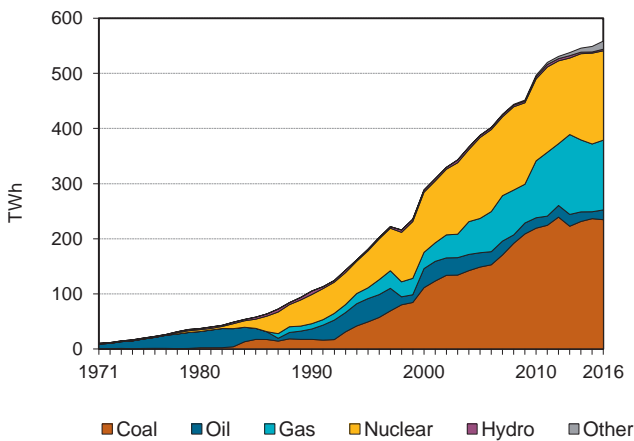


Figure 4. CO₂ from electricity generation: driving factors¹

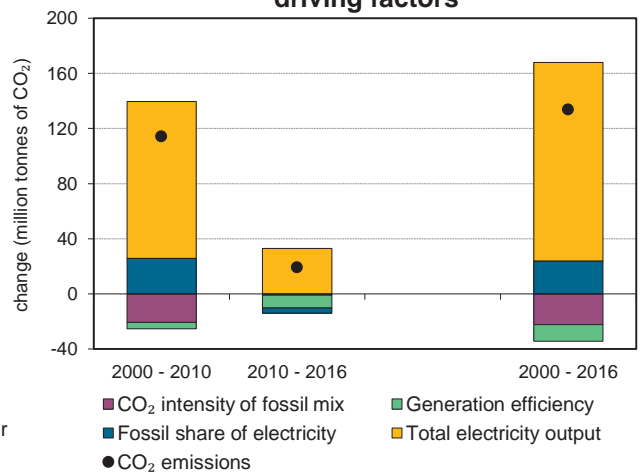


Figure 5. Changes in selected indicators

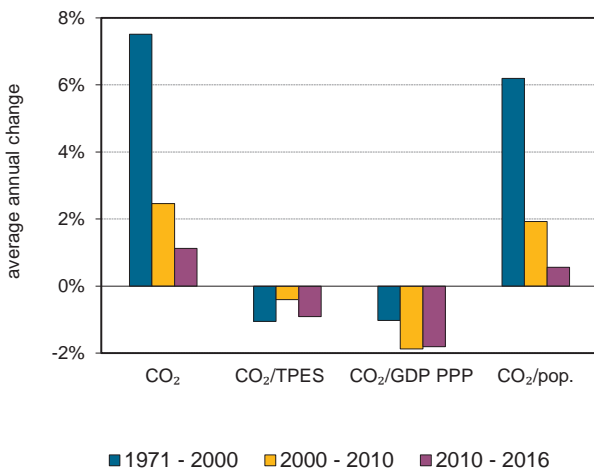
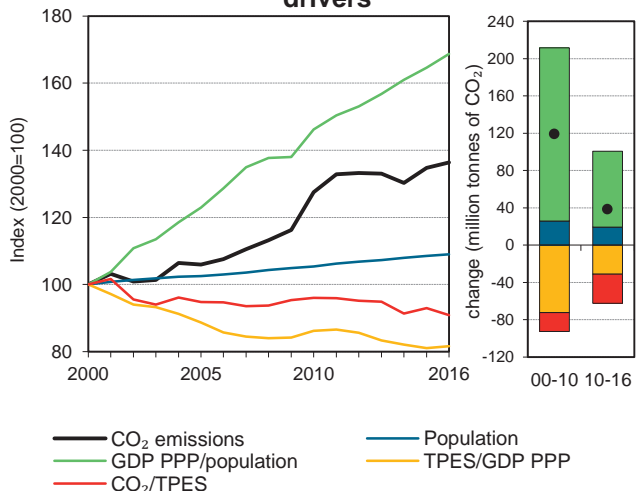


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Korea

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	231.8	357.3	431.9	457.7	550.9	582.0	589.2	154%
Share of World CO ₂ from fuel combustion	1.1%	1.7%	1.9%	1.7%	1.8%	1.8%	1.8%	
TPES (PJ)	3890	6 061	7 878	8 804	10 468	11 417	11 824	204%
GDP (billion 2010 USD)	362.9	543.6	710.0	894.7	1 094.5	1 268.8	1 305.9	260%
GDP PPP (billion 2010 USD)	499.1	747.6	976.5	1 230.5	1 505.3	1 745.0	1 796.1	260%
Population (millions)	42.9	45.1	47.0	48.2	49.6	51.0	51.2	20%
CO ₂ / TPES (tCO ₂ per TJ)	59.6	59.0	54.8	52.0	52.6	51.0	49.8	-16%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.64	0.7	0.6	0.5	0.5	0.5	0.5	-29%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.46	0.5	0.4	0.4	0.4	0.3	0.3	-29%
CO ₂ / population (tCO ₂ per capita)	5.4	7.9	9.2	9.5	11.1	11.4	11.5	113%
Share of electricity output from fossil fuels	44%	61%	61%	61%	69%	68%	68%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	544	574	546	497	546	527	521	-4%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	154	186	197	238	251	254	154%
Population index	100	105	110	112	116	119	120	20%
GDP PPP per population index	100	142	178	219	261	294	301	201%
Energy intensity index - TPES / GDP PPP	100	104	104	92	89	84	84	-16%
Carbon intensity index - CO ₂ / TPES	100	99	92	87	88	86	84	-16%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	303.3		169.0	99.0	589.2	154%
Electricity and heat generation	243.5		15.5	48.3	310.2	442%
Other energy industry own use	26.3		19.9	0.2	46.4	508%
Manufacturing industries and construction	31.4		10.9	17.6	73.0	42%
Transport	-		98.5	2.8	101.3	132%
<i>of which: road</i>	-		93.0	2.8	95.8	201%
Other	2.3		24.1	30.1	58.2	-19%
<i>of which: residential</i>	2.3		10.5	20.8	33.6	-21%
<i>of which: services</i>	-		6.8	9.3	17.8	-16%
<i>Memo: international marine bunkers</i>	-		34.0	-	34.0	539%
<i>Memo: international aviation bunkers</i>	-		14.7	-	14.7	+

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	201.6	15.6	28.8	28.8
Road - oil	93.0	31.9	13.3	42.1
Main activity prod. elec. and heat - gas	45.4	4.8	6.5	48.5
Unallocated autoproducers - coal	41.8	22.3	6.0	54.5
Manufacturing industries - coal	31.4	14.8	4.5	59.0
Other energy industry - coal	26.3	2.7	3.7	62.7
Residential - gas	20.8	1.1	3.0	65.7
Other energy industry own use - oil	19.9	4.9	2.8	68.6
Manufacturing industries - gas	17.6	0.2	2.5	71.1
<i>Memo: total CO₂ from fuel combustion</i>	<i>589.2</i>	<i>231.8</i>	<i>84.1</i>	<i>84.1</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Kosovo ¹

Figure 1. CO₂ emissions by fuel

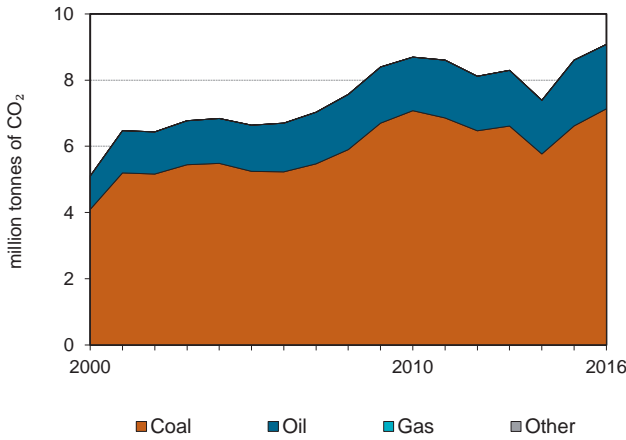


Figure 2. CO₂ emissions by sector

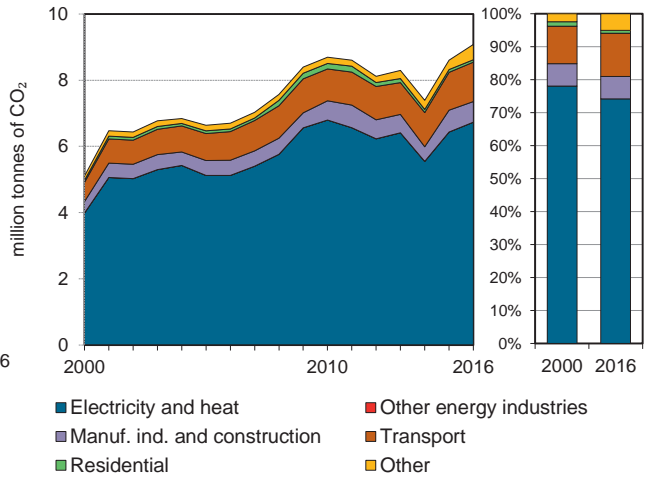


Figure 3. Electricity generation by fuel

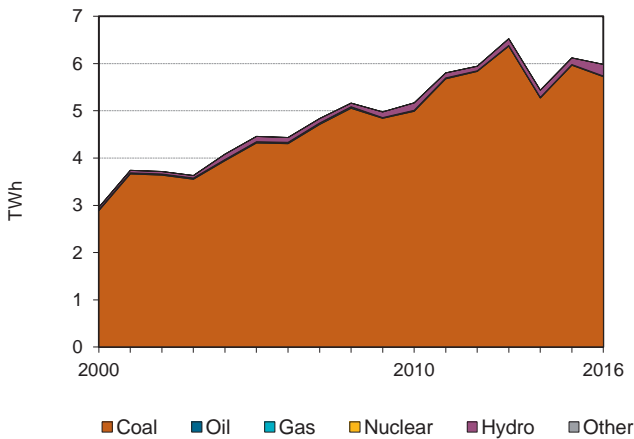


Figure 4. CO₂ from electricity generation: driving factors²

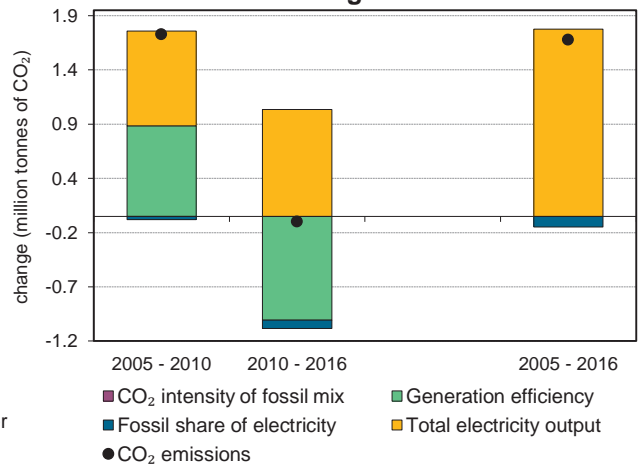


Figure 5. Changes in selected indicators

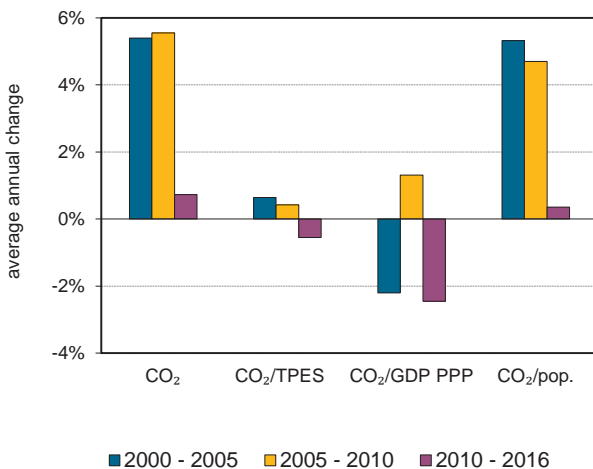
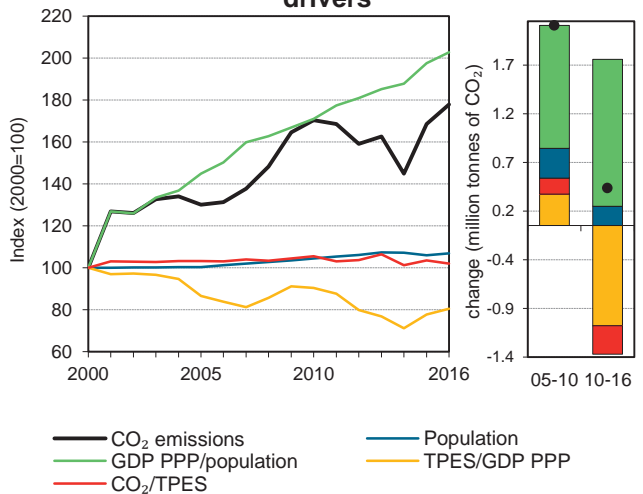


Figure 6. Total CO₂ emissions and drivers³



1. Prior to 2000, data for Kosovo were included in Serbia.

2. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.

3. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Kosovo ¹

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 00-16
CO ₂ fuel combustion (MtCO ₂)	5.1	6.6	8.7	8.6	9.1	78%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	65	81	104	105	113	74%
GDP (billion 2010 USD)	3.3	4.7	5.8	6.8	7.1	116%
GDP PPP (billion 2010 USD)	7.7	11.2	13.7	16.1	16.6	116%
Population (millions)	1.7	1.7	1.8	1.8	1.8	7%
CO ₂ / TPES (tCO ₂ per TJ)	78.9	81.5	83.2	81.7	80.5	2%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.6	1.4	1.5	1.3	1.3	-18%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.7	0.6	0.6	0.5	0.5	-18%
CO ₂ / population (tCO ₂ per capita)	3.0	3.9	4.9	4.8	5.0	67%
Share of electricity output from fossil fuels	98%	98%	97%	98%	96%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	1340	1142	1311	1051	1125	-16%
CO₂ emissions and drivers - Kaya decomposition (2000=100) ²								
CO ₂ emissions index	100	130	170	169	178	78%
Population index	100	100	104	106	107	7%
GDP PPP per population index	100	145	171	198	203	103%
Energy intensity index - TPES / GDP PPP	100	87	90	78	81	-19%
Carbon intensity index - CO ₂ / TPES	100	103	105	104	102	2%

1. Prior to 2000, data for Kosovo were included in Serbia. 2. Please see the chapter *Indicator sources and methods* in Part I for methodological notes.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ³	Total	%change 00-16
CO₂ fuel combustion	7.1	1.9	-	-	9.1	78%
Electricity and heat generation	6.7	0.0	-	-	6.7	69%
Other energy industry own use	-	-	-	-	-	-
Manufacturing industries and construction	0.1	0.5	-	-	0.6	80%
Transport	-	1.2	-	-	1.2	106%
<i>of which: road</i>	-	1.2	-	-	1.2	106%
Other	0.3	0.2	-	-	0.5	175%
<i>of which: residential</i>	0.0	0.0	-	-	0.1	6%
<i>of which: services</i>	0.3	0.1	-	-	0.4	344%
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.0	-	-	0.0	x

3. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ⁴ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	6.7	3.9	..	..
Road - oil	1.2	0.6	..	..
Manufacturing industries - oil	0.5	0.2	..	..
Non-specified other sectors - coal	0.3	0.0	..	..
Non-specified other - oil	0.2	0.1	..	..
Manufacturing industries - coal	0.1	0.1	..	..
Residential - coal	0.0	0.0	..	..
Residential - oil	0.0	0.1	..	..
Main activity prod. elec. and heat - oil	0.0	0.0	..	..
<i>Memo: total CO₂ from fuel combustion</i>	9.1	..	..	..

4. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Kuwait

Figure 1. CO₂ emissions by fuel

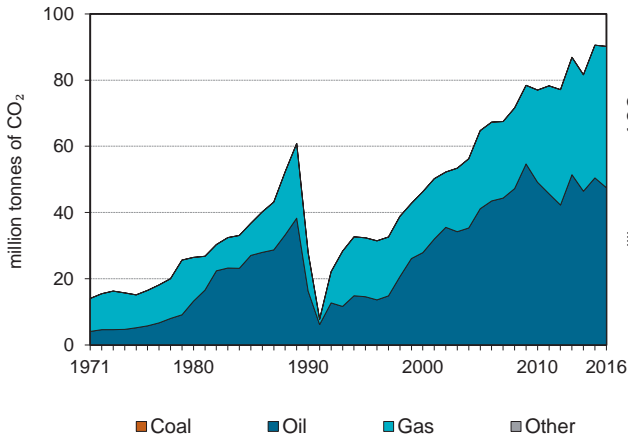


Figure 2. CO₂ emissions by sector

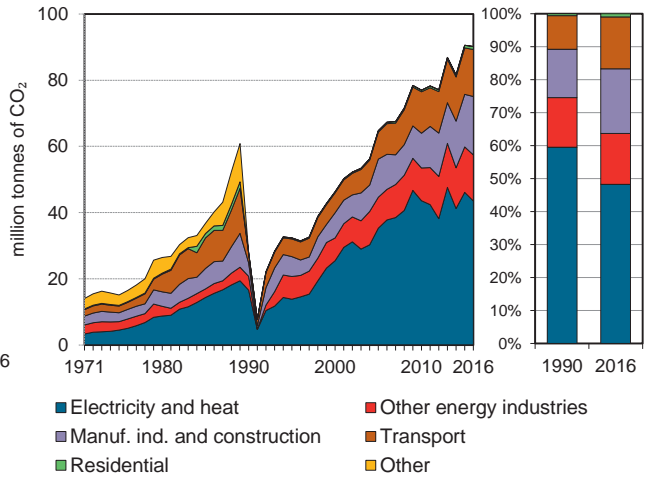


Figure 3. Electricity generation by fuel

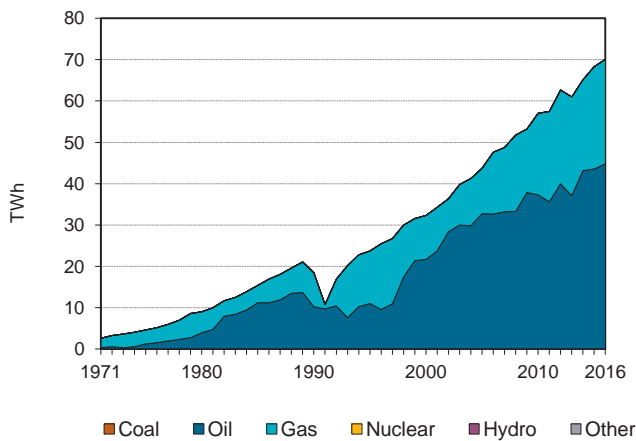


Figure 4. CO₂ from electricity generation: driving factors¹

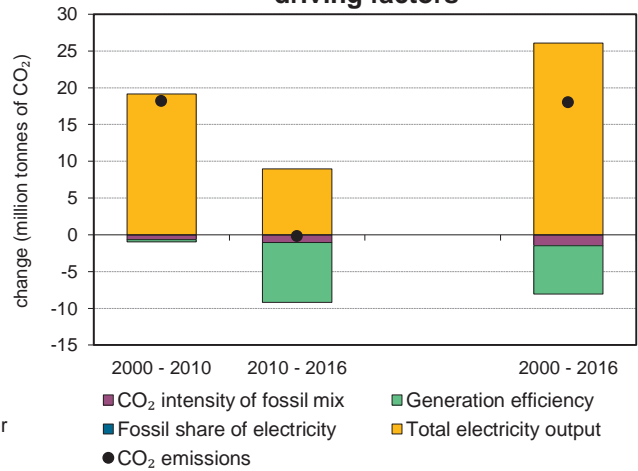


Figure 5. Changes in selected indicators

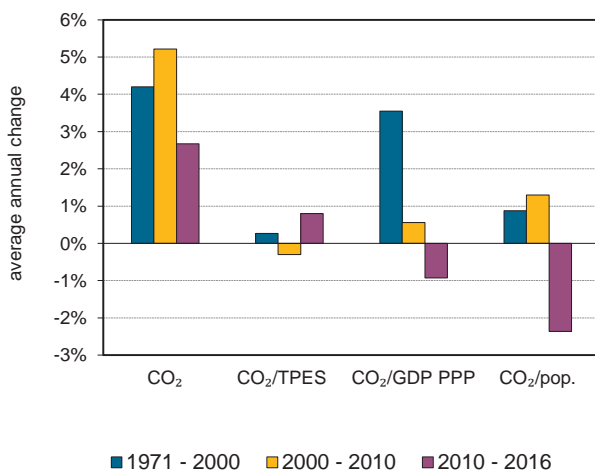
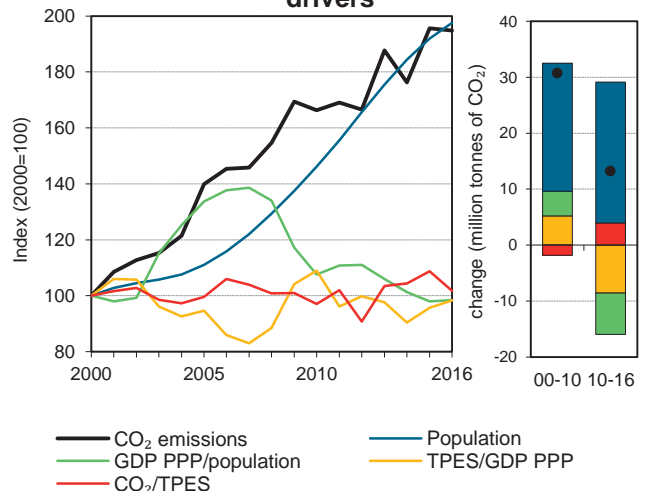


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Kuwait

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	27.8	32.4	46.3	64.8	77.0	90.6	90.2	224%
Share of World CO ₂ from fuel combustion	0.1%	0.2%	0.2%	0.2%	0.3%	0.3%	0.3%	
TPES (PJ)	381	619	784	1 100	1 344	1 410	1 500	293%
GDP (billion 2010 USD)	40.7	66.8	73.4	108.9	115.4	139.7	143.1	252%
GDP PPP (billion 2010 USD)	77.8	127.9	140.5	208.5	220.9	264.1	273.4	251%
Population (millions)	2.1	1.6	2.1	2.3	3.0	3.9	4.1	93%
CO ₂ / TPES (tCO ₂ per TJ)	72.9	52.2	59.1	58.8	57.3	64.2	60.1	-18%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.68	0.5	0.6	0.6	0.7	0.6	0.6	-8%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.36	0.3	0.3	0.3	0.3	0.3	0.3	-8%
CO ₂ / population (tCO ₂ per capita)	13.2	20.1	22.6	28.4	25.7	23.0	22.3	68%
Share of electricity output from fossil fuels	100%	100%	100%	100%	100%	100%	100%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	895	583	788	807	764	675	621	-31%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	116	167	233	277	326	324	224%
Population index	100	77	98	108	143	187	193	93%
GDP PPP per population index	100	214	185	247	199	181	182	82%
Energy intensity index - TPES / GDP PPP	100	99	114	108	124	109	112	12%
Carbon intensity index - CO ₂ / TPES	100	72	81	81	79	88	82	-18%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	47.5	42.7	-	90.2	224%
Electricity and heat generation	-	28.9	14.6	-	43.5	163%
Other energy industry own use	-	1.0	12.9	-	13.9	232%
Manufacturing industries and construction	-	2.5	15.2	-	17.6	335%
Transport	-	14.2	-	-	14.2	400%
<i>of which: road</i>	-	14.2	-	-	14.2	400%
Other	-	0.9	-	-	0.9	445%
<i>of which: residential</i>	-	0.9	-	-	0.9	445%
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	3.5	-	-	3.5	519%
<i>Memo: international aviation bunkers</i>	-	2.9	-	-	2.9	461%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - oil	28.9	12.4	23.0	23.0
Manufacturing industries - gas	15.2	3.8	12.1	35.1
Main activity prod. elec. and heat - gas	14.6	4.2	11.6	46.7
Road - oil	14.2	2.8	11.3	58.1
Other energy industry own use - gas	12.9	3.6	10.3	68.3
Manufacturing industries - oil	2.5	0.3	2.0	70.3
Other energy industry own use - oil	1.0	0.6	0.8	71.1
Residential - oil	0.9	0.2	0.7	71.8
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	<i>90.2</i>	<i>27.8</i>	<i>71.8</i>	<i>71.8</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Kyrgyzstan

Figure 1. CO₂ emissions by fuel

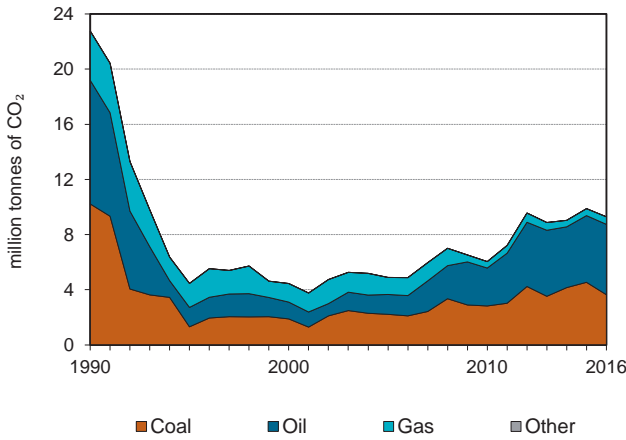


Figure 2. CO₂ emissions by sector

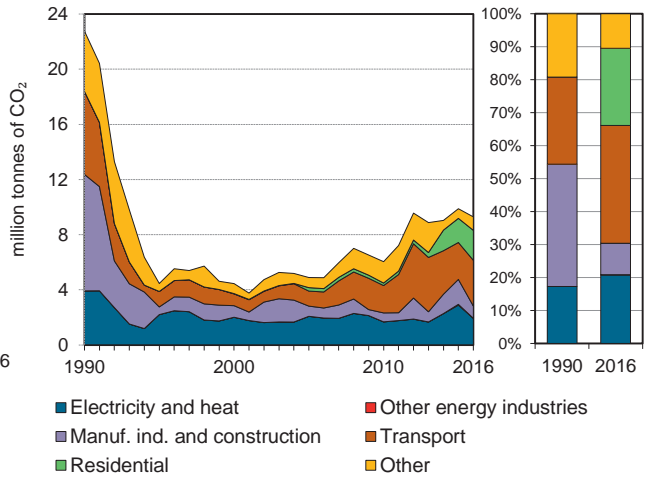


Figure 3. Electricity generation by fuel

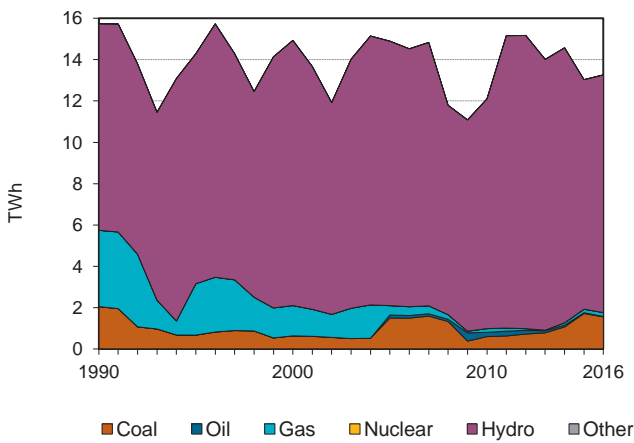


Figure 4. CO₂ from electricity generation: driving factors¹

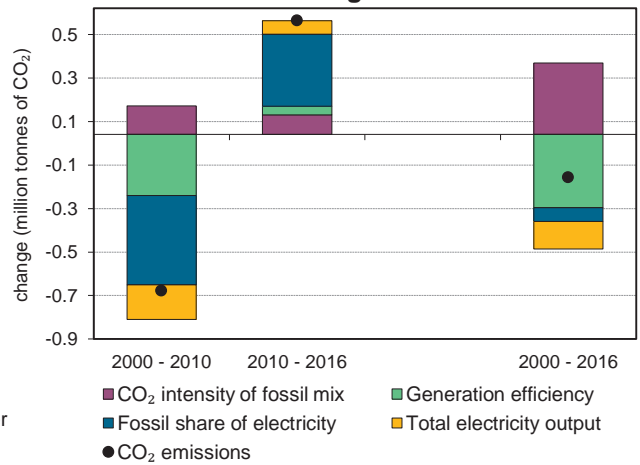


Figure 5. Changes in selected indicators

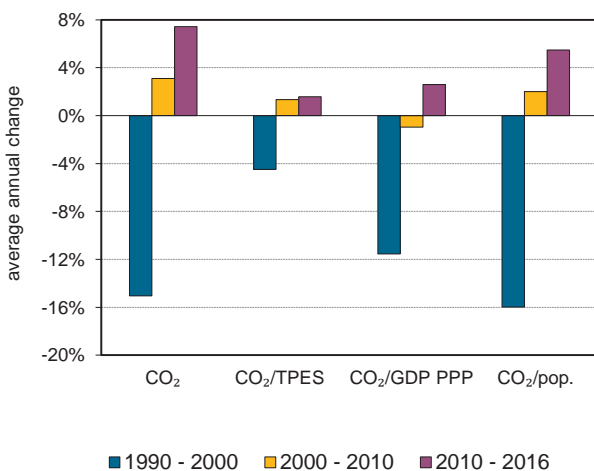
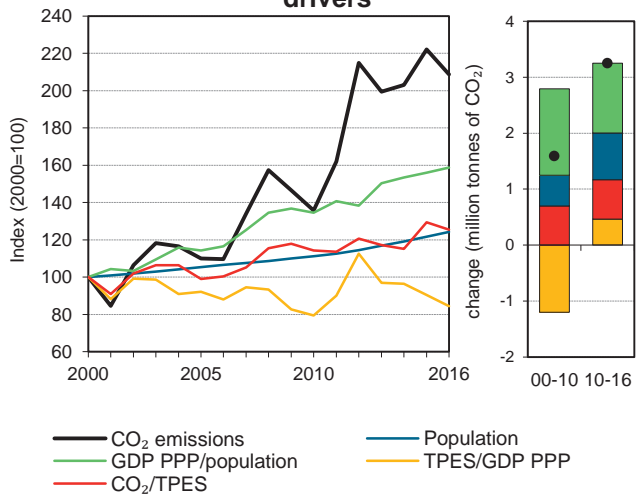


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Kyrgyzstan

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	22.8	4.5	4.5	4.9	6.0	9.9	9.3	-59%
Share of World CO ₂ from fuel combustion	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	313	100	97	108	115	167	162	-48%
GDP (billion 2010 USD)	4.8	2.4	3.2	3.9	4.8	6.1	6.3	31%
GDP PPP (billion 2010 USD)	15	7.6	10.0	12.0	14.9	18.9	19.6	31%
Population (millions)	4.4	4.6	4.9	5.2	5.4	6.0	6.1	39%
CO ₂ / TPES (tCO ₂ per TJ)	72.6	44.7	45.8	45.4	52.4	59.3	57.5	-21%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	4.73	1.8	1.4	1.3	1.3	1.6	1.5	-69%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	1.52	0.6	0.4	0.4	0.4	0.5	0.5	-69%
CO ₂ / population (tCO ₂ per capita)	5.2	1.0	0.9	0.9	1.1	1.7	1.5	-71%
Share of electricity output from fossil fuels	37%	22%	14%	14%	8%	15%	13%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	167	100	78	55	37	92	74	-56%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	20	20	21	27	43	41	-59%
Population index	100	104	112	118	124	136	139	39%
GDP PPP per population index	100	49	60	68	80	93	95	-5%
Energy intensity index - TPES / GDP PPP	100	63	47	43	37	42	39	-61%
Carbon intensity index - CO ₂ / TPES	100	62	63	63	72	82	79	-21%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	3.6	5.1	0.5	-	9.3	-59%
Electricity and heat generation	1.6	0.1	0.2	-	1.9	-51%
Other energy industry own use	-	-	0.0	-	0.0	x
Manufacturing industries and construction	0.4	0.4	0.1	-	0.9	-89%
Transport	-	3.3	-	-	3.3	-45%
<i>of which: road</i>	-	3.3	-	-	3.3	-46%
Other	1.6	1.3	0.2	-	3.1	-28%
<i>of which: residential</i>	1.1	0.9	0.2	-	2.2	x
<i>of which: services</i>	0.5	0.0	0.1	-	0.6	x
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.3	-	-	0.3	20%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	3.3	6.0	18.4	18.4
Main activity prod. elec. and heat - coal	1.6	1.8	9.0	27.3
Residential - coal	1.1	-	6.1	33.4
Residential - oil	0.9	-	5.1	38.5
Non-specified other sectors - coal	0.5	-	2.9	41.4
Manufacturing industries - coal	0.4	8.4	2.4	43.8
Manufacturing industries - oil	0.4	-	2.3	46.1
Non-specified other - oil	0.4	2.9	2.3	48.4
Residential - gas	0.2	-	1.1	49.4
<i>Memo: total CO₂ from fuel combustion</i>	9.3	22.8	52.3	52.3

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Latvia

Figure 1. CO₂ emissions by fuel

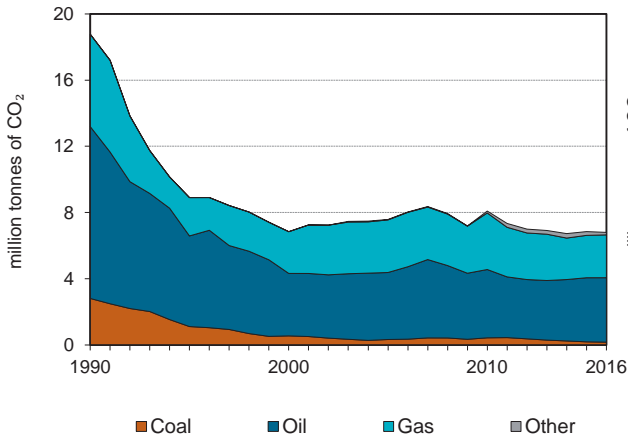


Figure 2. CO₂ emissions by sector

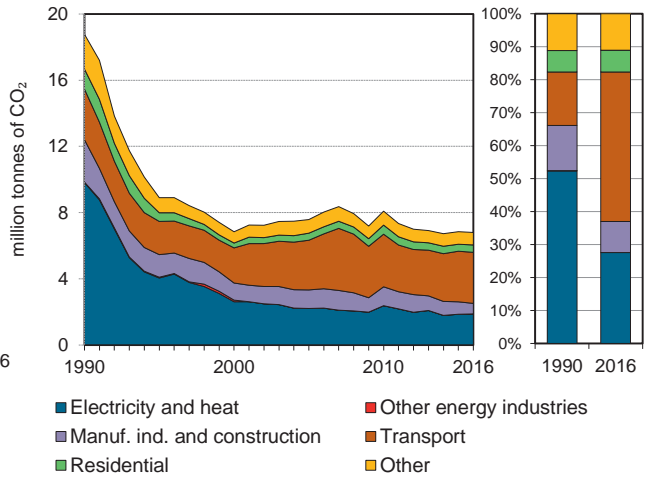


Figure 3. Electricity generation by fuel

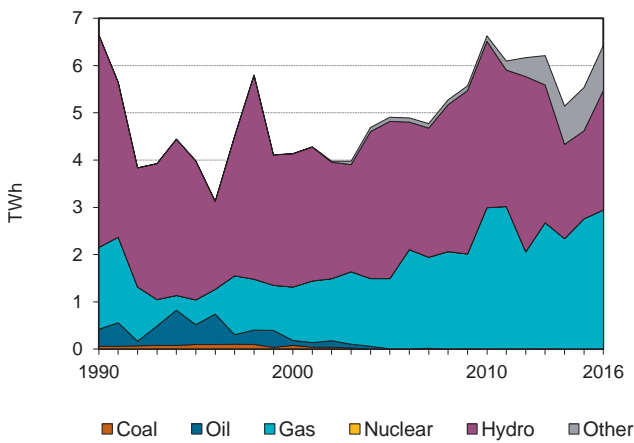


Figure 4. CO₂ from electricity generation: driving factors¹

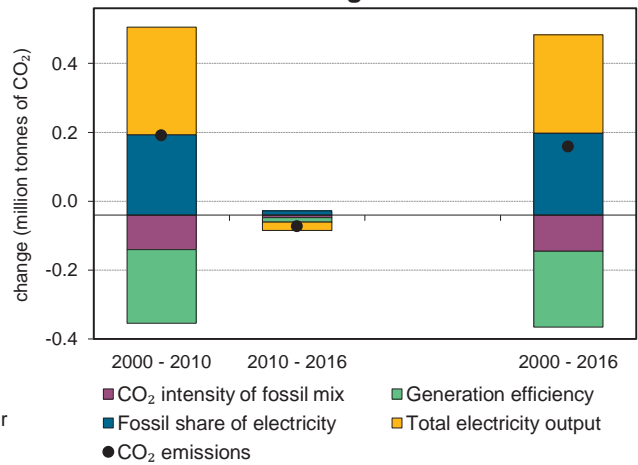


Figure 5. Changes in selected indicators

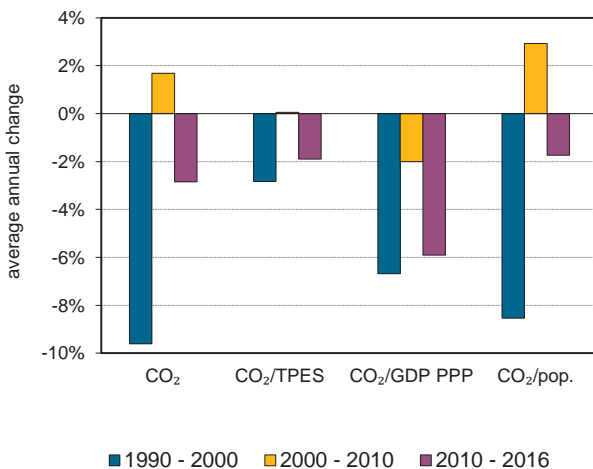
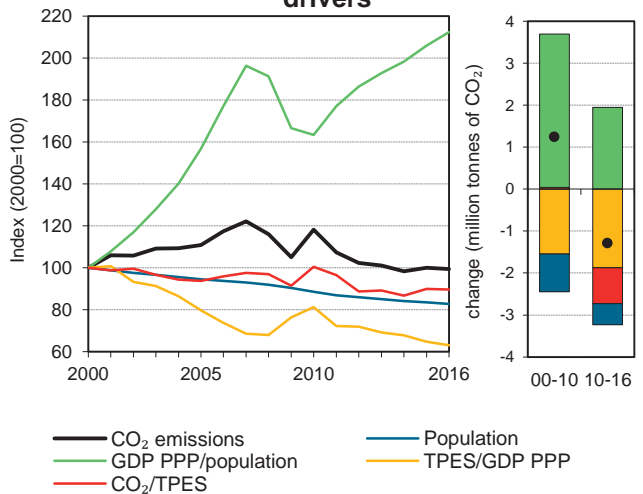


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Latvia

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	18.8	8.9	6.8	7.6	8.1	6.8	6.8	-64%
Share of World CO ₂ from fuel combustion	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	330	192	160	190	189	178	178	-46%
GDP (billion 2010 USD)	..	12.8	16.4	24.4	23.8	28.3	28.9	..
GDP PPP (billion 2010 USD)	35.1	19.8	25.5	37.8	36.9	43.8	44.8	28%
Population (millions)	2.7	2.5	2.4	2.2	2.1	2.0	2.0	-26%
CO ₂ / TPES (tCO ₂ per TJ)	56.8	46.3	42.6	40.0	42.9	38.4	38.2	-33%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	..	0.7	0.4	0.3	0.3	0.2	0.2	..
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.54	0.4	0.3	0.2	0.2	0.2	0.2	-72%
CO ₂ / population (tCO ₂ per capita)	7.1	3.6	2.9	3.4	3.9	3.5	3.5	-51%
Share of electricity output from fossil fuels	32%	26%	32%	30%	45%	50%	46%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	115	132	134	86	118	145	117	1%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	47	36	40	43	36	36	-64%
Population index	100	93	89	84	79	74	74	-26%
GDP PPP per population index	100	61	82	128	134	168	174	74%
Energy intensity index - TPES / GDP PPP	100	103	67	53	54	43	42	-58%
Carbon intensity index - CO ₂ / TPES	100	81	75	70	75	67	67	-33%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.2	3.9	2.6	0.2	6.8	-64%
Electricity and heat generation	0.0	0.0	1.8	-	1.9	-81%
Other energy industry own use	-	-	-	-	-	-100%
Manufacturing industries and construction	0.1	0.2	0.3	0.2	0.6	-75%
Transport	-	3.1	-	-	3.1	1%
<i>of which: road</i>	-	2.9	-	-	2.9	23%
Other	0.1	0.6	0.5	-	1.2	-64%
<i>of which: residential</i>	0.0	0.1	0.2	-	0.4	-63%
<i>of which: services</i>	0.0	0.1	0.2	-	0.4	-73%
<i>Memo: international marine bunkers</i>	-	1.0	-	-	1.0	-34%
<i>Memo: international aviation bunkers</i>	-	0.4	-	-	0.4	68%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	2.9	2.3	26.4	26.4
Main activity prod. elec. and heat - gas	1.8	2.8	16.2	42.6
Non-specified other - oil	0.5	1.3	4.4	47.0
Manufacturing industries - gas	0.3	1.0	2.3	49.3
Non-specified other - gas	0.3	0.3	2.3	51.6
Residential - gas	0.2	0.2	2.3	53.9
Other transport - oil	0.2	0.6	1.7	55.6
Manufacturing industries - oil	0.2	1.4	1.5	57.1
Manufacturing industries - other	0.2	-	1.4	58.4
<i>Memo: total CO₂ from fuel combustion</i>	6.8	18.8	62.0	62.0

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Lebanon

Figure 1. CO₂ emissions by fuel

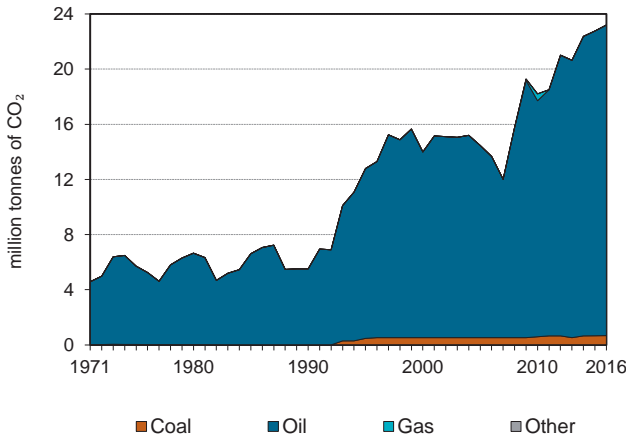


Figure 2. CO₂ emissions by sector

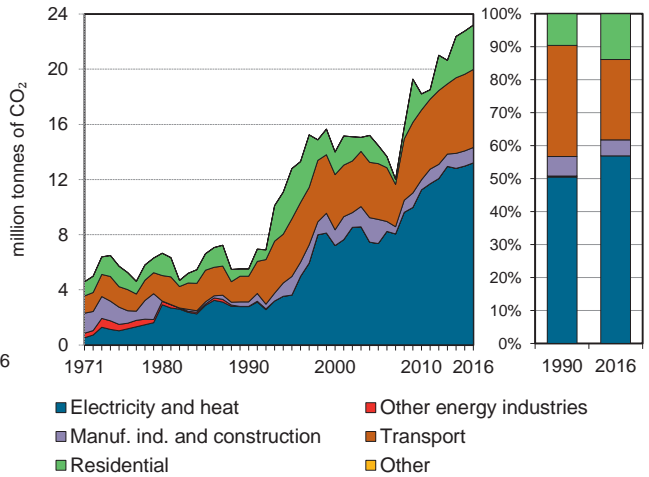


Figure 3. Electricity generation by fuel

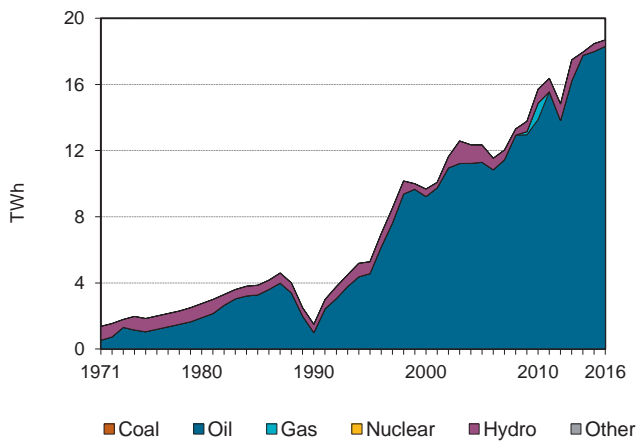


Figure 4. CO₂ from electricity generation: driving factors¹

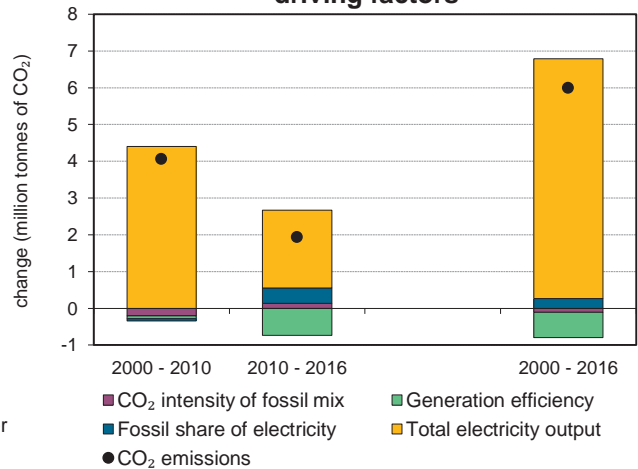


Figure 5. Changes in selected indicators

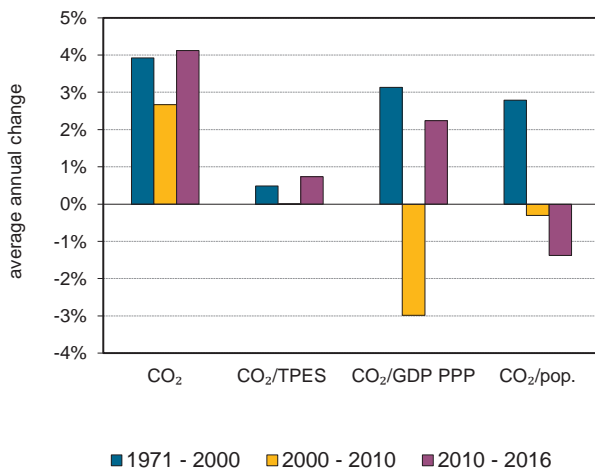
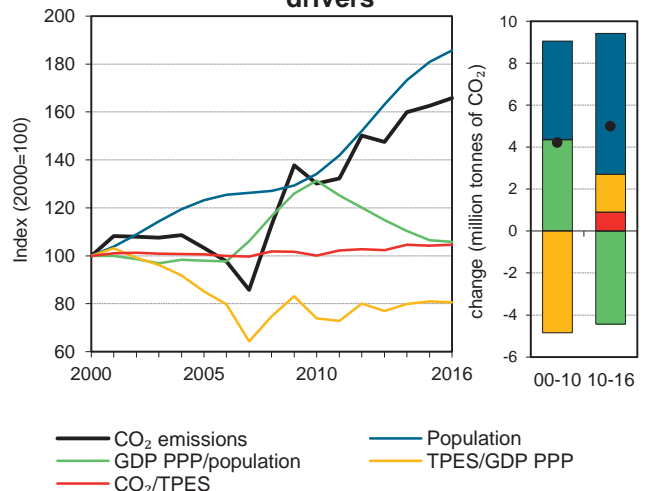


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Lebanon

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	5.5	12.8	14.0	14.5	18.2	22.8	23.2	321%
Share of World CO ₂ from fuel combustion	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	
TPES (PJ)	82	185	205	211	267	321	326	298%
GDP (billion 2010 USD)	11.4	20.3	21.8	26.3	38.0	41.2	41.9	267%
GDP PPP (billion 2010 USD)	20.8	37.0	39.7	47.9	69.9	76.6	78.1	275%
Population (millions)	2.7	3.0	3.2	4.0	4.3	5.9	6.0	122%
CO ₂ / TPES (tCO ₂ per TJ)	67.4	69.3	68.1	68.5	68.2	71.0	71.2	6%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.48	0.6	0.6	0.5	0.5	0.6	0.6	15%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.27	0.3	0.4	0.3	0.3	0.3	0.3	12%
CO ₂ / population (tCO ₂ per capita)	2	4.2	4.3	3.6	4.2	3.9	3.9	89%
Share of electricity output from fossil fuels	67%	86%	95%	92%	95%	97%	98%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	1854	685	745	596	716	702	707	-62%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	232	254	262	330	413	421	321%
Population index	100	112	120	148	160	216	222	122%
GDP PPP per population index	100	158	160	156	209	170	169	69%
Energy intensity index - TPES / GDP PPP	100	127	132	112	97	107	106	6%
Carbon intensity index - CO ₂ / TPES	100	103	101	102	101	105	106	6%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.7	22.5	-	-	23.2	321%
Electricity and heat generation	-	13.2	-	-	13.2	375%
Other energy industry own use	-	-	-	-	-	-100%
Manufacturing industries and construction	0.7	0.4	-	-	1.1	242%
Transport	-	5.7	-	-	5.7	204%
<i>of which: road</i>	-	5.7	-	-	5.7	204%
Other	-	3.2	-	-	3.2	509%
<i>of which: residential</i>	-	3.2	-	-	3.2	509%
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	0.1	-	-	0.1	x
<i>Memo: international aviation bunkers</i>	-	0.8	-	-	0.8	372%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - oil	8.8	2.8	30.6	30.6
Road - oil	5.7	1.9	19.6	50.2
Unallocated autoproducers - oil	4.4	-	15.1	65.3
Residential - oil	3.2	0.5	11.1	76.4
Manufacturing industries - coal	0.7	-	2.3	78.7
Manufacturing industries - oil	0.4	0.3	1.5	80.3
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	23.2	5.5	80.3	80.3

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Libya

Figure 1. CO₂ emissions by fuel

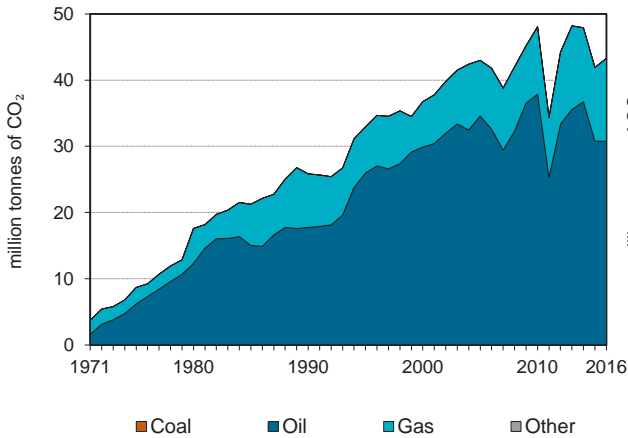


Figure 2. CO₂ emissions by sector

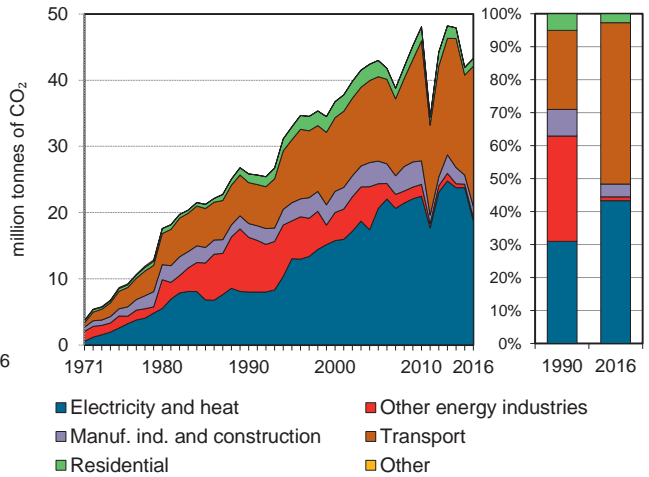


Figure 3. Electricity generation by fuel

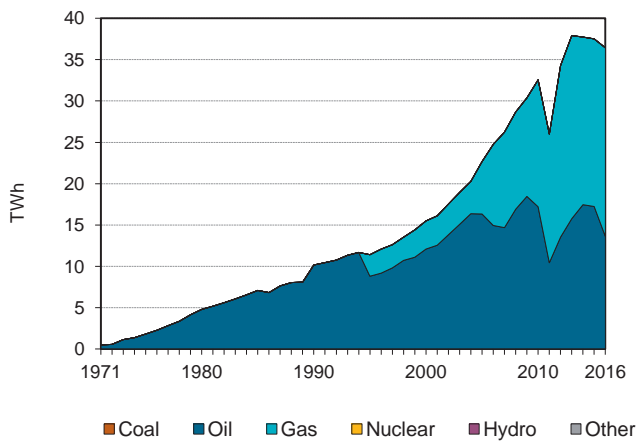


Figure 4. CO₂ from electricity generation: driving factors¹

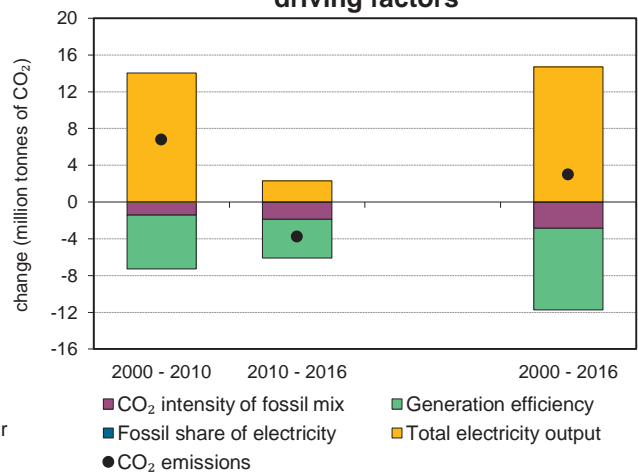


Figure 5. Changes in selected indicators

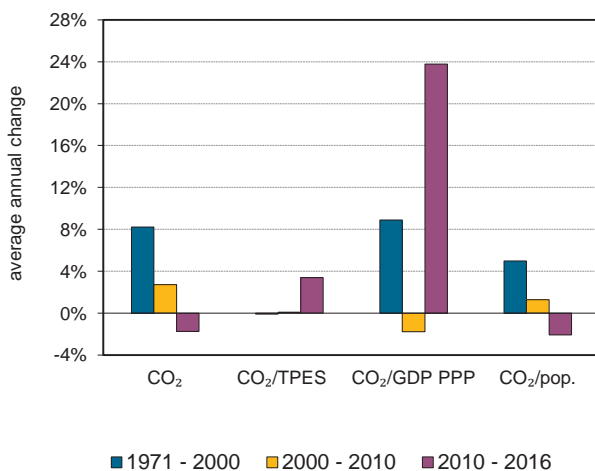
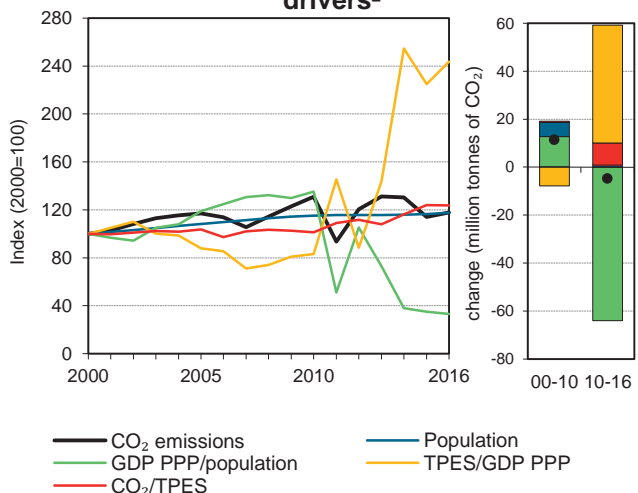


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Libya

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	25.8	33.0	36.8	43.0	48.1	41.9	43.3	67%
Share of World CO ₂ from fuel combustion	0.1%	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	
TPES (PJ)	468	586	662	748	856	609	631	35%
GDP (billion 2010 USD)	46.9	45.4	48.0	61.7	74.8	19.6	18.8	-60%
GDP PPP (billion 2010 USD)	112.4	108.7	115.0	147.8	179.1	47.0	45.0	-60%
Population (millions)	4.4	4.9	5.4	5.8	6.2	6.2	6.3	42%
CO ₂ / TPES (tCO ₂ per TJ)	55.3	56.3	55.5	57.5	56.1	68.8	68.6	24%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.55	0.7	0.8	0.7	0.6	2.1	2.3	319%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.23	0.3	0.3	0.3	0.3	0.9	1.0	319%
CO ₂ / population (tCO ₂ per capita)	5.8	6.7	6.9	7.4	7.8	6.7	6.9	18%
Share of electricity output from fossil fuels	100%	100%	100%	100%	100%	100%	100%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	787	1142	1017	910	690	633	515	-35%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	128	142	166	186	162	167	67%
Population index	100	112	121	131	139	141	142	42%
GDP PPP per population index	100	87	85	101	115	30	28	-72%
Energy intensity index - TPES / GDP PPP	100	130	138	122	115	311	337	237%
Carbon intensity index - CO ₂ / TPES	100	102	100	104	102	125	124	24%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	30.8	12.5	-	43.3	67%
Electricity and heat generation	-	6.5	12.3	-	18.8	134%
Other energy industry own use	-	0.4	0.1	-	0.5	-94%
Manufacturing industries and construction	-	1.6	0.1	-	1.7	-20%
Transport	-	21.2	-	-	21.2	243%
<i>of which: road</i>	-	21.2	-	-	21.2	243%
Other	-	1.2	-	-	1.2	-11%
<i>of which: residential</i>	-	1.2	-	-	1.2	-11%
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	0.3	-	-	0.3	6%
<i>Memo: international aviation bunkers</i>	-	0.2	-	-	0.2	-69%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	21.2	6.2	33.2	33.2
Main activity prod. elec. and heat - gas	12.3	-	19.3	52.4
Main activity prod. elec. and heat - oil	6.5	8.0	10.1	62.6
Manufacturing industries - oil	1.6	0.5	2.4	65.0
Residential - oil	1.2	1.3	1.8	66.8
Other energy industry own use - oil	0.4	1.8	0.6	67.4
Other energy industry own use - gas	0.1	6.5	0.2	67.6
Manufacturing industries - gas	0.1	1.6	0.2	67.8
Other transport - oil	0.0	0.0	0.0	67.8
<i>Memo: total CO₂ from fuel combustion</i>	43.3	25.8	67.8	67.8

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Lithuania

Figure 1. CO₂ emissions by fuel

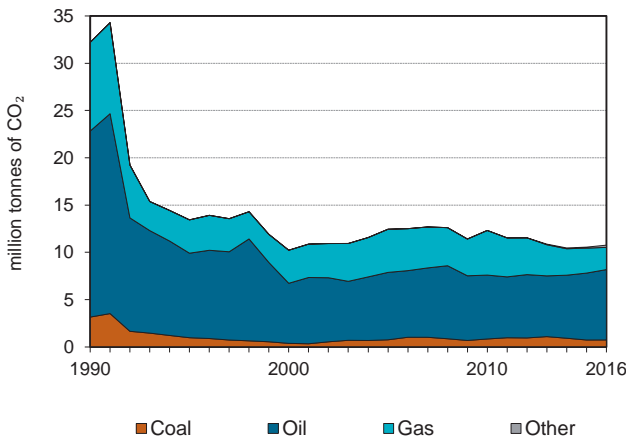


Figure 2. CO₂ emissions by sector

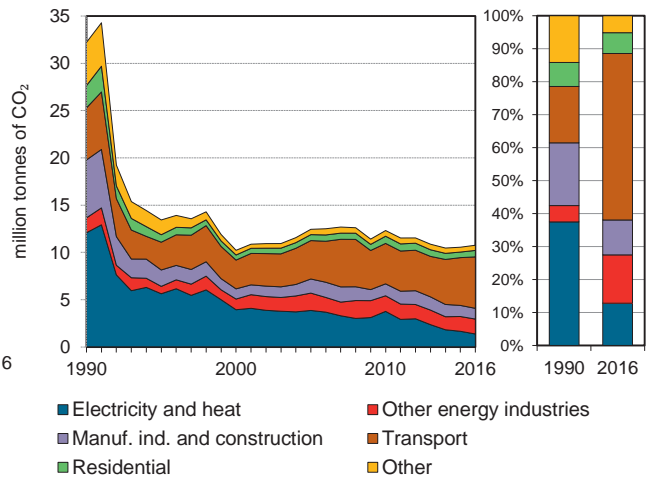


Figure 3. Electricity generation by fuel

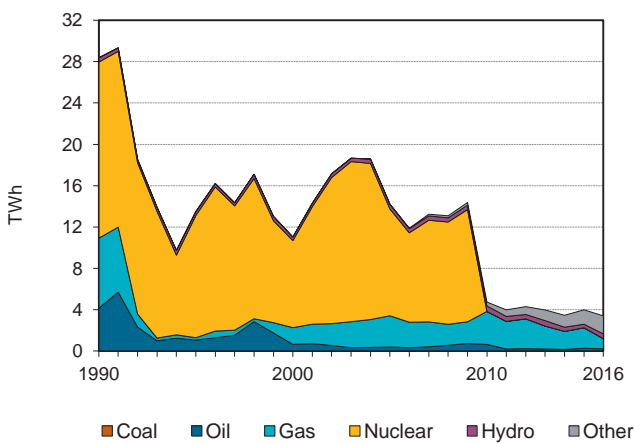


Figure 4. CO₂ from electricity generation: driving factors¹

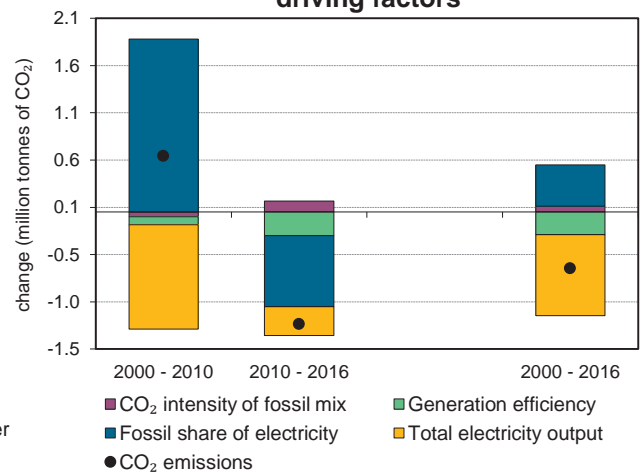


Figure 5. Changes in selected indicators

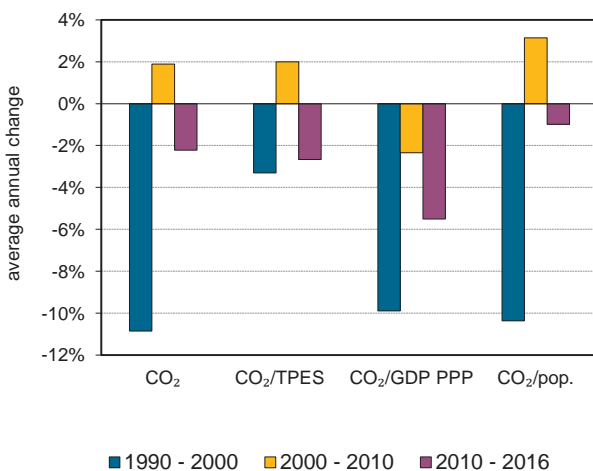
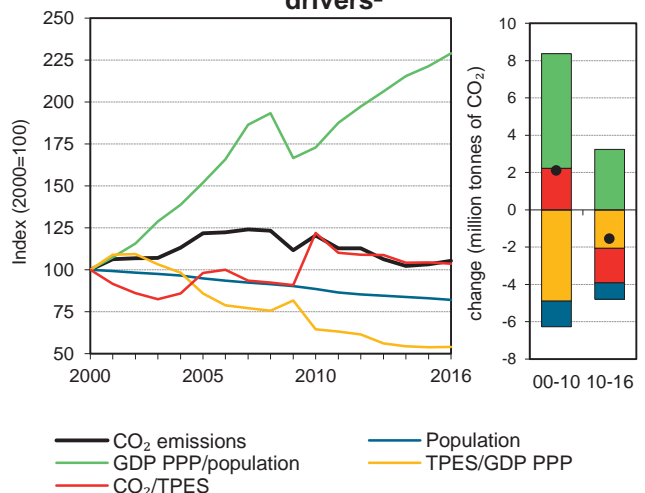


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Lithuania

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	32.2	13.4	10.2	12.4	12.3	10.6	10.8	-67%
Share of World CO ₂ from fuel combustion	0.2%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	
TPES (PJ)	673	365	299	370	295	295	303	-55%
GDP (billion 2010 USD)	27	19.3	24.3	35.0	37.1	44.6	45.6	69%
GDP PPP (billion 2010 USD)	45.3	32.4	40.7	58.8	62.3	74.8	76.5	69%
Population (millions)	3.7	3.6	3.5	3.3	3.1	2.9	2.9	-22%
CO ₂ / TPES (tCO ₂ per TJ)	47.9	36.8	34.2	33.6	41.7	35.7	35.5	-26%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.19	0.7	0.4	0.4	0.3	0.2	0.2	-80%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.71	0.4	0.3	0.2	0.2	0.1	0.1	-80%
CO ₂ / population (tCO ₂ per capita)	8.7	3.7	2.9	3.7	4.0	3.6	3.7	-57%
Share of electricity output from fossil fuels	38%	10%	20%	24%	77%	54%	36%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	159	66	100	101	340	186	139	-12%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	42	32	39	38	33	33	-67%
Population index	100	98	95	90	84	79	78	-22%
GDP PPP per population index	100	73	95	144	164	210	217	117%
Energy intensity index - TPES / GDP PPP	100	76	49	42	32	27	27	-73%
Carbon intensity index - CO ₂ / TPES	100	77	71	70	87	75	74	-26%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.7	7.4	2.4	0.2	10.8	-67%
Electricity and heat generation	0.0	0.1	1.0	0.2	1.4	-89%
Other energy industry own use	-	1.5	0.1	-	1.6	0%
Manufacturing industries and construction	0.4	0.1	0.7	-	1.1	-81%
Transport	-	5.4	0.1	-	5.4	-1%
<i>of which: road</i>	-	5.2	0.0	-	5.2	1%
Other	0.4	0.3	0.5	-	1.2	-82%
<i>of which: residential</i>	0.2	0.1	0.3	-	0.7	-71%
<i>of which: services</i>	0.2	0.0	0.2	-	0.3	-90%
<i>Memo: international marine bunkers</i>	-	0.5	-	-	0.5	72%
<i>Memo: international aviation bunkers</i>	-	0.3	-	-	0.3	-29%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	5.2	5.1	26.2	26.2
Other energy industry own use - oil	1.5	1.6	7.7	33.9
Main activity prod. elec. and heat - gas	0.9	5.4	4.4	38.3
Manufacturing industries - gas	0.7	2.1	3.4	41.7
Manufacturing industries - coal	0.4	0.2	1.8	43.5
Residential - gas	0.3	0.5	1.7	45.2
Main activity prod. elec. and heat - other	0.2	-	1.2	46.4
Residential - coal	0.2	1.5	1.0	47.5
Non-specified other - gas	0.2	0.9	1.0	48.5
<i>Memo: total CO₂ from fuel combustion</i>	<i>10.8</i>	<i>32.2</i>	<i>54.4</i>	<i>54.4</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Luxembourg

Figure 1. CO₂ emissions by fuel

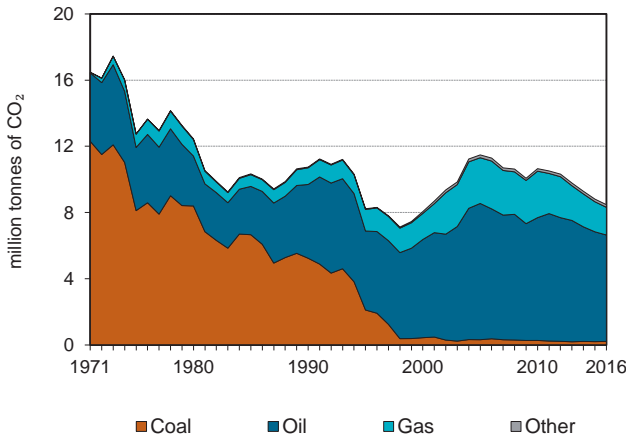


Figure 2. CO₂ emissions by sector

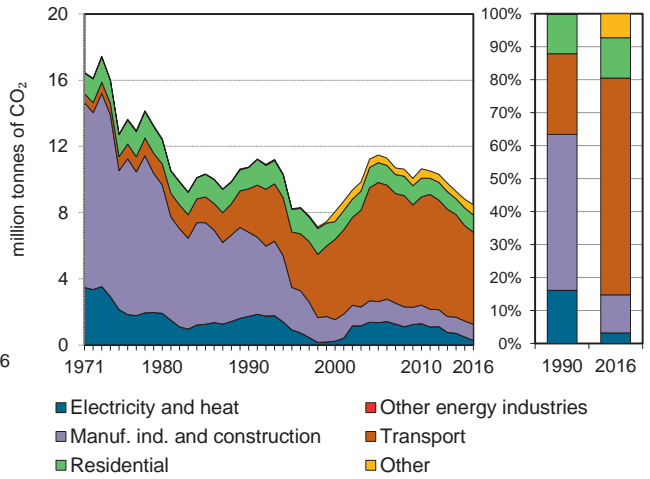


Figure 3. Electricity generation by fuel

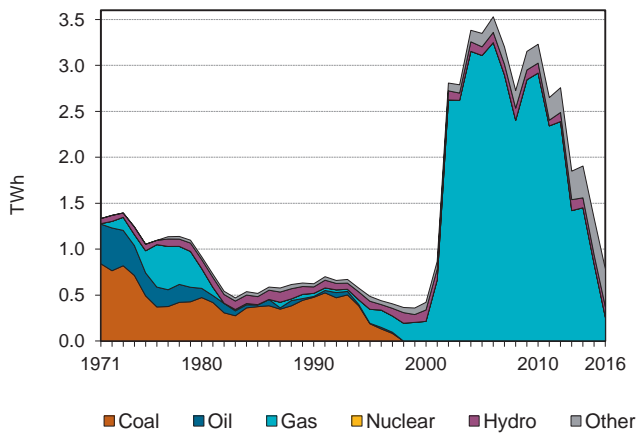


Figure 4. CO₂ from electricity generation: driving factors¹

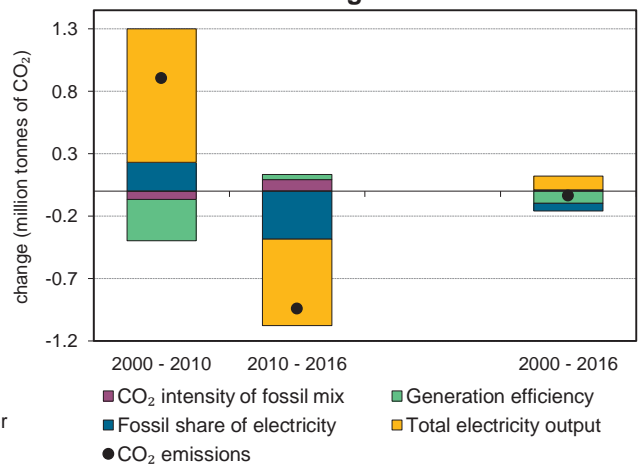


Figure 5. Changes in selected indicators

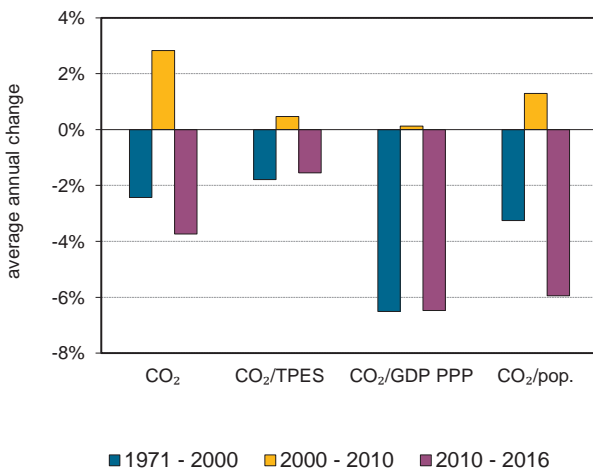
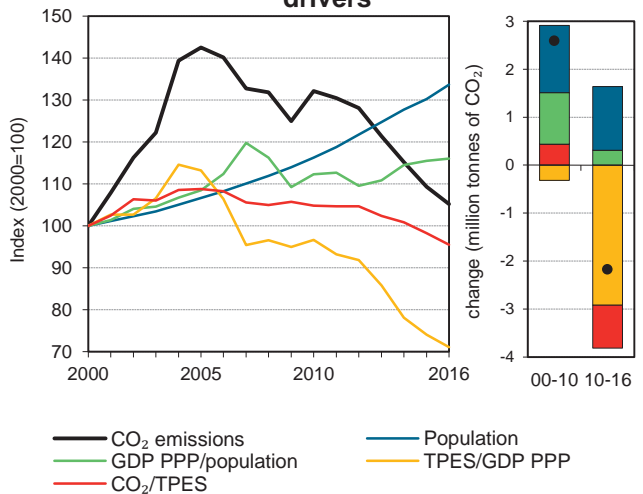


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Luxembourg

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	10.8	8.2	8.1	11.5	10.6	8.8	8.5	-21%
Share of World CO ₂ from fuel combustion	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	142	132	140	184	177	156	154	9%
GDP (billion 2010 USD)	24.1	30.6	40.8	47.2	53.2	61.3	63.2	162%
GDP PPP (billion 2010 USD)	19.7	25.0	33.3	38.5	43.5	50.1	51.7	162%
Population (millions)	0.4	0.4	0.4	0.5	0.5	0.6	0.6	53%
CO ₂ / TPES (tCO ₂ per TJ)	75.7	62.4	57.5	62.5	60.2	56.4	54.9	-28%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.45	0.3	0.2	0.2	0.2	0.1	0.1	-70%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.55	0.3	0.2	0.3	0.2	0.2	0.2	-70%
CO ₂ / population (tCO ₂ per capita)	28.1	20.1	18.4	24.6	21.0	15.5	14.5	-48%
Share of electricity output from fossil fuels	87%	78%	59%	94%	92%	68%	42%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	..	..	467	345	341	281	205	..
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	77	75	107	99	82	79	-21%
Population index	100	107	114	122	133	149	153	53%
GDP PPP per population index	100	118	148	160	166	171	171	71%
Energy intensity index - TPES / GDP PPP	100	73	58	66	56	43	42	-58%
Carbon intensity index - CO ₂ / TPES	100	82	76	83	80	75	72	-28%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.2	6.4	1.7	0.2	8.5	-21%
Electricity and heat generation	-	0.0	0.2	0.1	0.3	-84%
Other energy industry own use	-	-	-	-	-	-
Manufacturing industries and construction	0.2	0.0	0.7	0.1	1.0	-81%
Transport	-	5.6	-	-	5.6	112%
<i>of which: road</i>	-	5.6	-	-	5.6	112%
Other	0.0	0.8	0.8	-	1.7	26%
<i>of which: residential</i>	0.0	0.5	0.5	-	1.0	-20%
<i>of which: services</i>	-	0.3	0.3	-	0.6	x
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	1.5	-	-	1.5	290%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	5.6	2.6	55.6	55.6
Manufacturing industries - gas	0.7	0.7	6.6	62.2
Residential - gas	0.5	0.3	5.2	67.4
Residential - oil	0.5	0.9	5.1	72.5
Non-specified other - gas	0.3	-	3.1	75.6
Non-specified other - oil	0.3	0.0	3.1	78.7
Manufacturing industries - coal	0.2	3.6	2.1	80.8
Main activity prod. elec. and heat - gas	0.1	-	1.4	82.2
Main activity prod. elec. and heat - other	0.1	0.0	0.8	83.0
<i>Memo: total CO₂ from fuel combustion</i>	8.5	10.8	84.8	84.8

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Malaysia

Figure 1. CO₂ emissions by fuel

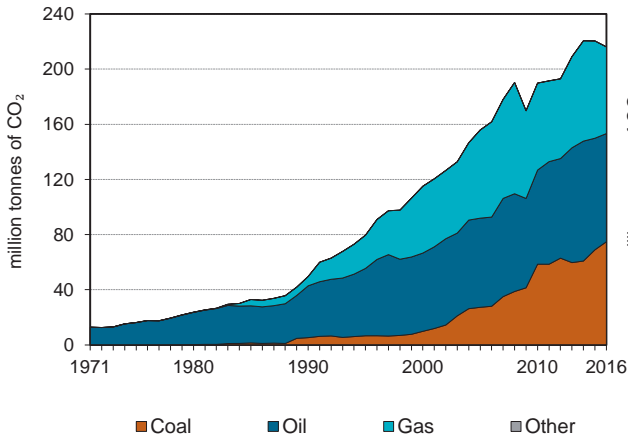


Figure 2. CO₂ emissions by sector

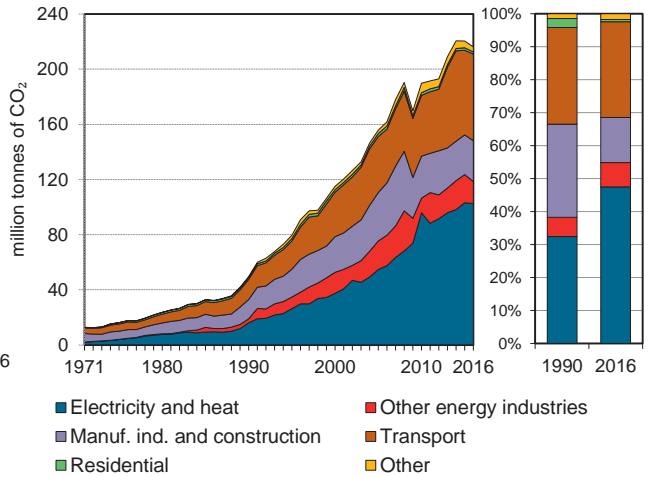


Figure 3. Electricity generation by fuel

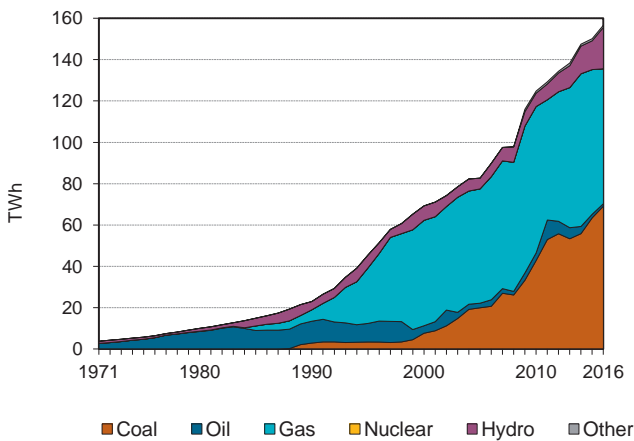


Figure 4. CO₂ from electricity generation: driving factors¹

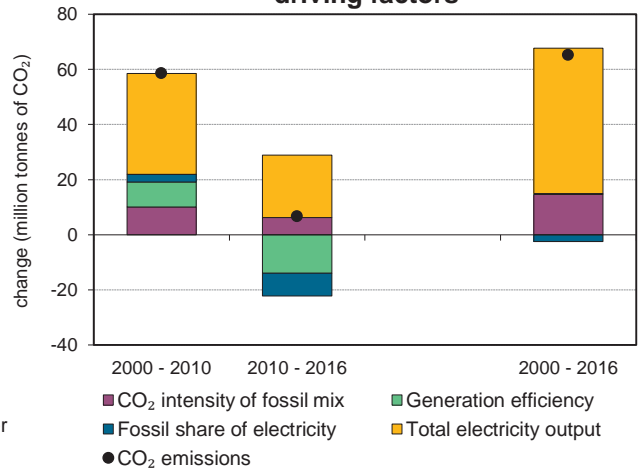


Figure 5. Changes in selected indicators

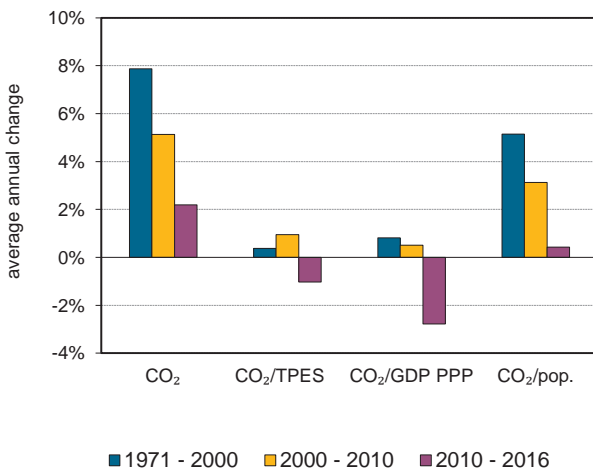
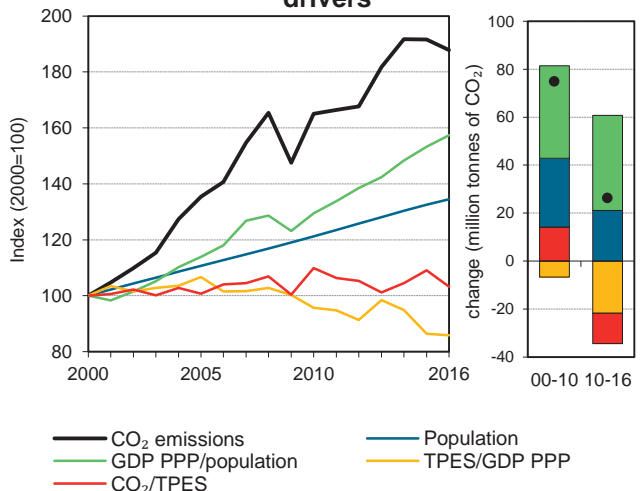


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Malaysia

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	49.6	79.6	115.1	155.8	189.9	220.4	216.2	336%
Share of World CO ₂ from fuel combustion	0.2%	0.4%	0.5%	0.6%	0.6%	0.7%	0.7%	
TPES (PJ)	914	1 448	2 047	2 752	3 073	3 595	3 723	307%
GDP (billion 2010 USD)	81.8	128.6	162.5	204.9	255.0	330.0	343.9	320%
GDP PPP (billion 2010 USD)	186.5	293.2	370.5	467.0	581.4	752.6	784.3	321%
Population (millions)	18	20.5	23.2	25.7	28.1	30.7	31.2	73%
CO ₂ / TPES (tCO ₂ per TJ)	54.3	55.0	56.2	56.6	61.8	61.3	58.1	7%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.61	0.6	0.7	0.8	0.7	0.7	0.6	4%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.27	0.3	0.3	0.3	0.3	0.3	0.3	4%
CO ₂ / population (tCO ₂ per capita)	2.8	3.9	5.0	6.1	6.8	7.2	6.9	152%
Share of electricity output from fossil fuels	83%	86%	90%	94%	94%	90%	87%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	699	581	541	662	769	687	655	-6%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	160	232	314	383	444	436	336%
Population index	100	114	129	142	156	170	173	73%
GDP PPP per population index	100	138	155	176	200	237	243	143%
Energy intensity index - TPES / GDP PPP	100	101	113	120	108	97	97	-3%
Carbon intensity index - CO ₂ / TPES	100	101	104	104	114	113	107	7%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	74.8	78.4	62.9	-	216.2	336%
Electricity and heat generation	67.7	1.2	33.7	-	102.6	538%
Other energy industry own use	-	1.3	14.6	-	15.9	449%
Manufacturing industries and construction	7.1	8.5	14.1	-	29.6	111%
Transport	-	62.3	0.5	-	62.8	331%
<i>of which: road</i>	-	60.4	0.5	-	60.9	334%
Other	-	5.2	0.1	-	5.3	157%
<i>of which: residential</i>	-	1.6	0.0	-	1.6	19%
<i>of which: services</i>	-	2.5	0.1	-	2.5	261%
<i>Memo: international marine bunkers</i>	-	1.0	-	-	1.0	226%
<i>Memo: international aviation bunkers</i>	-	7.2	-	-	7.2	379%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	67.7	3.2	21.5	21.5
Road - oil	60.4	14.0	19.2	40.8
Main activity prod. elec. and heat - gas	31.1	3.2	9.9	50.7
Other energy industry own use - gas	14.6	2.4	4.6	55.3
Manufacturing industries - gas	14.1	1.1	4.5	59.8
Manufacturing industries - oil	8.5	10.9	2.7	62.5
Manufacturing industries - coal	7.1	2.0	2.2	64.7
Non-specified other - oil	3.6	0.7	1.1	65.9
Unallocated autoproducers - gas	2.6	-	0.8	66.7
<i>Memo: total CO₂ from fuel combustion</i>	<i>216.2</i>	<i>49.6</i>	<i>68.8</i>	<i>68.8</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Malta

Figure 1. CO₂ emissions by fuel

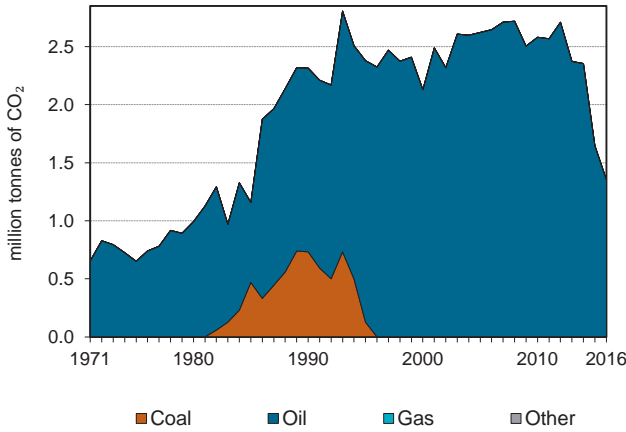


Figure 2. CO₂ emissions by sector

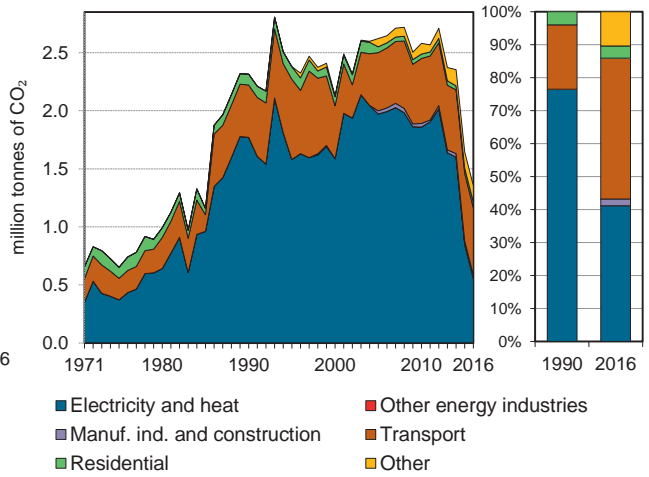


Figure 3. Electricity generation by fuel

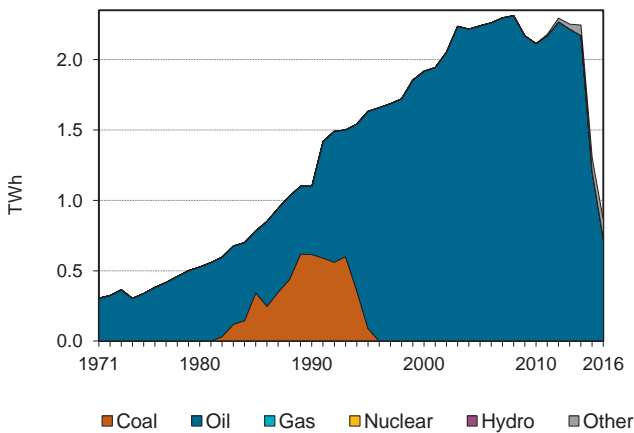


Figure 4. CO₂ from electricity generation: driving factors¹

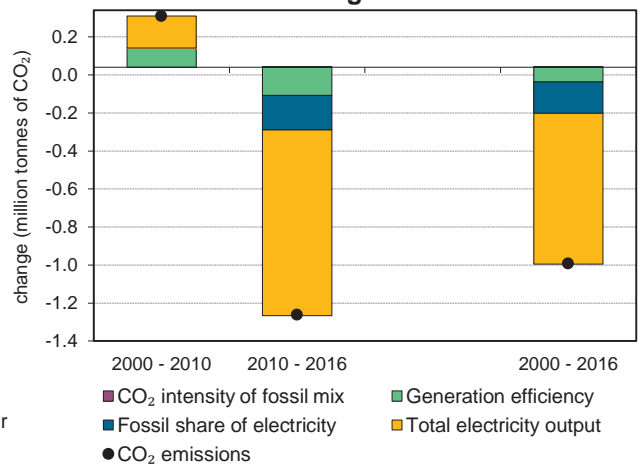


Figure 5. Changes in selected indicators

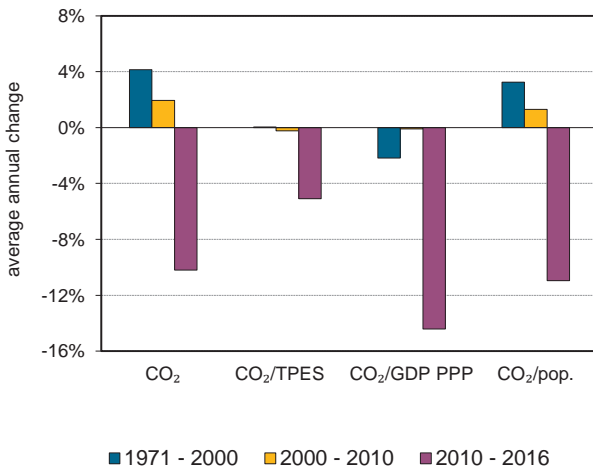
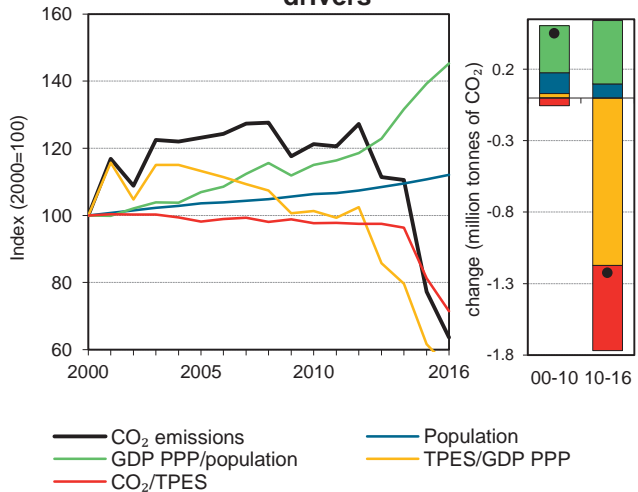


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Malta

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	2.3	2.4	2.1	2.6	2.6	1.6	1.4	-41%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	29	30	28	35	35	27	25	-13%
GDP (billion 2010 USD)	4.3	5.6	7.1	7.9	8.7	11.1	11.6	173%
GDP PPP (billion 2010 USD)	5.6	7.3	9.4	10.4	11.5	14.5	15.3	173%
Population (millions)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	23%
CO ₂ / TPES (tCO ₂ per TJ)	79.6	80.1	75.3	73.9	73.6	61.2	53.8	-32%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.54	0.4	0.3	0.3	0.3	0.1	0.1	-78%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.41	0.3	0.2	0.3	0.2	0.1	0.1	-79%
CO ₂ / population (tCO ₂ per capita)	6.5	6.3	5.5	6.5	6.2	3.8	3.1	-53%
Share of electricity output from fossil fuels	100%	100%	100%	100%	100%	92%	85%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	1610	968	828	880	880	652	651	-60%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	103	92	113	111	71	59	-41%
Population index	100	106	110	114	117	122	123	23%
GDP PPP per population index	100	123	152	163	175	212	221	121%
Energy intensity index - TPES / GDP PPP	100	78	58	66	59	36	32	-68%
Carbon intensity index - CO ₂ / TPES	100	101	95	93	92	77	68	-32%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	1.4	-	-	1.4	-41%
Electricity and heat generation	-	0.6	-	-	0.6	-69%
Other energy industry own use	-	-	-	-	-	-
Manufacturing industries and construction	-	0.0	-	-	0.0	x
Transport	-	0.6	-	-	0.6	28%
<i>of which: road</i>	-	0.5	-	-	0.5	18%
Other	-	0.2	-	-	0.2	104%
<i>of which: residential</i>	-	0.0	-	-	0.0	-46%
<i>of which: services</i>	-	0.1	-	-	0.1	x
<i>Memo: international marine bunkers</i>	-	5.6	-	-	5.6	+
<i>Memo: international aviation bunkers</i>	-	0.4	-	-	0.4	73%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - oil	0.6	1.0	30.3	30.3
Road - oil	0.5	0.5	28.9	59.3
Non-specified other - oil	0.1	-	7.6	66.9
Residential - oil	0.0	0.1	2.7	69.6
Other transport - oil	0.0	-	2.6	72.2
Manufacturing industries - oil	0.0	-	1.5	73.7
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	1.4	2.3	73.7	73.7

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Mauritius

Figure 1. CO₂ emissions by fuel

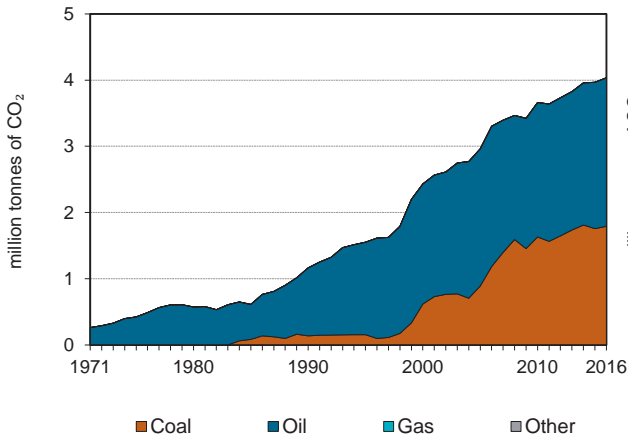


Figure 2. CO₂ emissions by sector

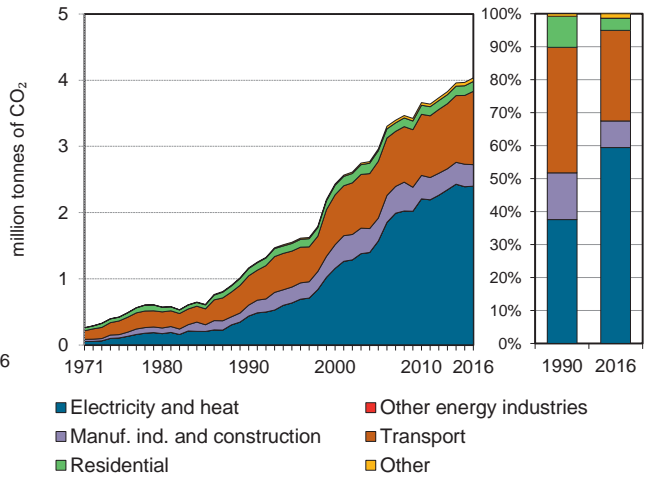


Figure 3. Electricity generation by fuel

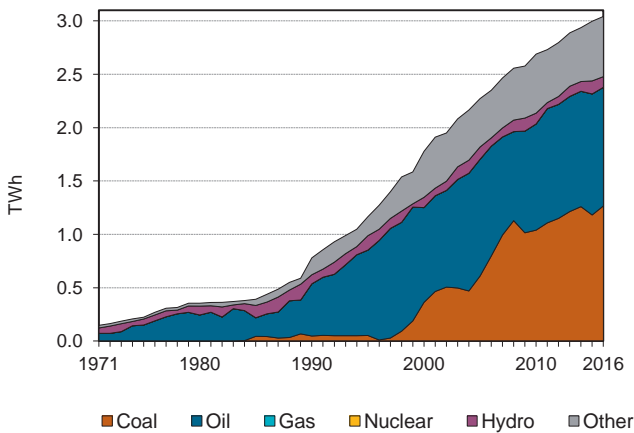


Figure 4. CO₂ from electricity generation: driving factors¹

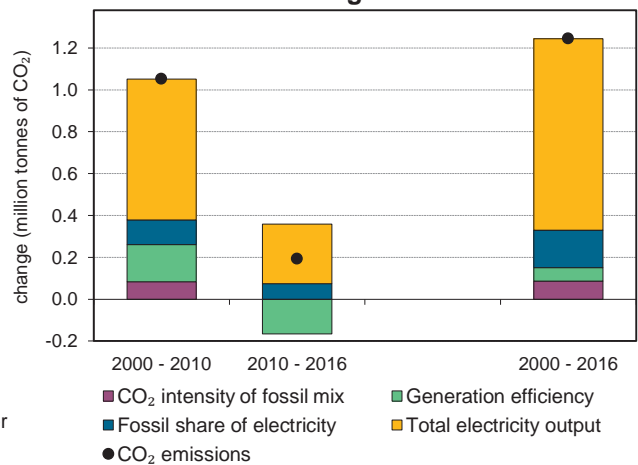


Figure 5. Changes in selected indicators

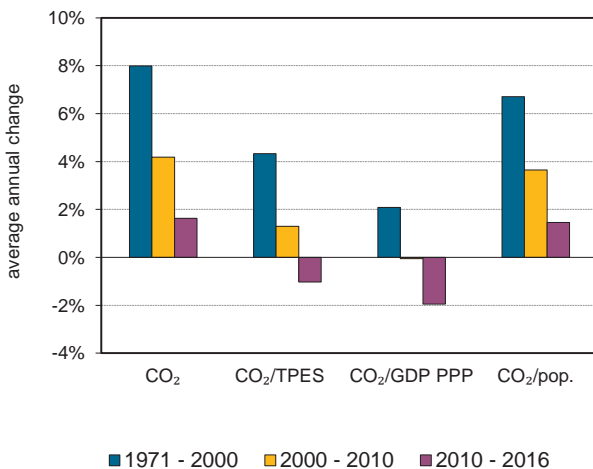
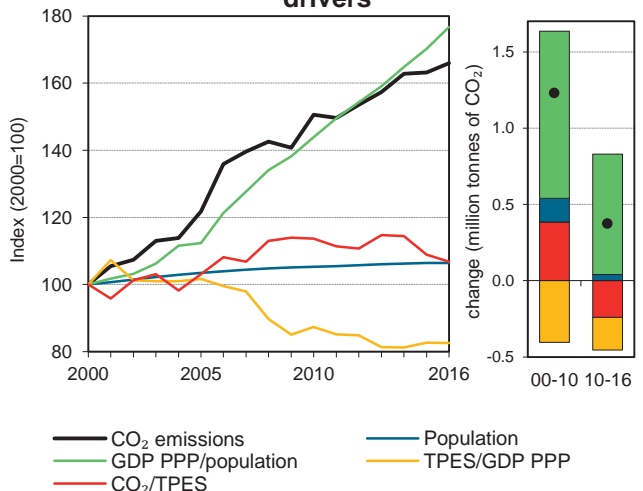


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Mauritius

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	1.2	1.6	2.4	3.0	3.7	4.0	4.0	247%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	28	33	42	49	55	62	64	131%
GDP (billion 2010 USD)	3.9	5.0	6.6	7.7	10.0	12.0	12.4	216%
GDP PPP (billion 2010 USD)	7.7	9.7	12.9	15.0	19.5	23.3	24.2	216%
Population (millions)	1.1	1.1	1.2	1.2	1.3	1.3	1.3	19%
CO ₂ / TPES (tCO ₂ per TJ)	41.7	47.4	58.6	60.4	66.6	63.8	62.6	50%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.3	0.3	0.4	0.4	0.4	0.3	0.3	10%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.15	0.2	0.2	0.2	0.2	0.2	0.2	10%
CO ₂ / population (tCO ₂ per capita)	1.1	1.4	2.0	2.4	2.9	3.1	3.2	191%
Share of electricity output from fossil fuels	69%	73%	70%	75%	76%	77%	78%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	560	545	651	691	821	798	789	41%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	133	209	254	315	341	347	247%
Population index	100	106	112	116	118	119	119	19%
GDP PPP per population index	100	120	150	168	216	255	265	165%
Energy intensity index - TPES / GDP PPP	100	92	88	90	77	73	73	-27%
Carbon intensity index - CO ₂ / TPES	100	114	140	145	160	153	150	50%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	1.8	2.2	-	-	4.0	247%
Electricity and heat generation	1.7	0.7	-	-	2.4	449%
Other energy industry own use	-	-	-	-	-	-
Manufacturing industries and construction	0.1	0.2	-	-	0.3	98%
Transport	-	1.1	-	-	1.1	150%
<i>of which: road</i>	-	1.0	-	-	1.0	+
Other	-	0.2	-	-	0.2	71%
<i>of which: residential</i>	-	0.1	-	-	0.1	36%
<i>of which: services</i>	-	0.0	-	-	0.0	700%
<i>Memo: international marine bunkers</i>	-	1.1	-	-	1.1	457%
<i>Memo: international aviation bunkers</i>	-	0.9	-	-	0.9	331%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Unallocated autoproducers - coal	1.7	0.1	36.5	36.5
Road - oil	1.0	0.1	22.4	58.8
Main activity prod. elec. and heat - oil	0.7	0.3	14.7	73.5
Manufacturing industries - oil	0.2	0.1	5.2	78.7
Residential - oil	0.1	0.1	3.2	81.9
Manufacturing industries - coal	0.1	0.0	1.7	83.6
Other transport - oil	0.1	0.3	1.3	84.9
Non-specified other - oil	0.1	0.0	1.2	86.0
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	4.0	1.2	86.0	86.0

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Mexico

Figure 1. CO₂ emissions by fuel

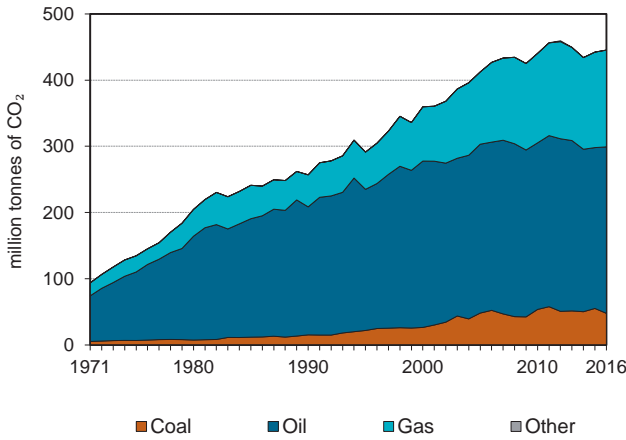


Figure 2. CO₂ emissions by sector

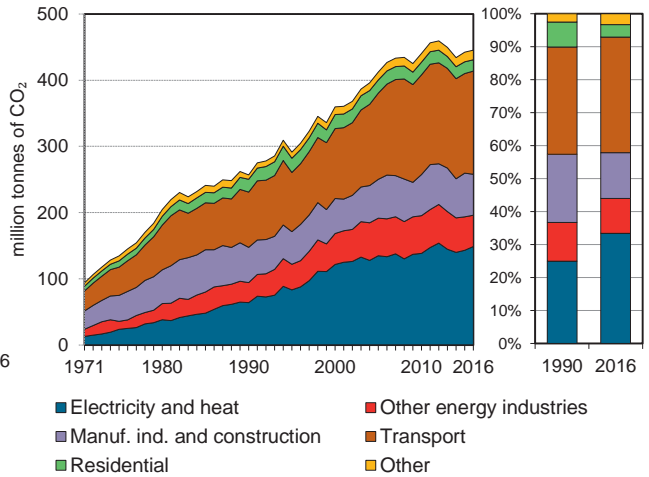


Figure 3. Electricity generation by fuel

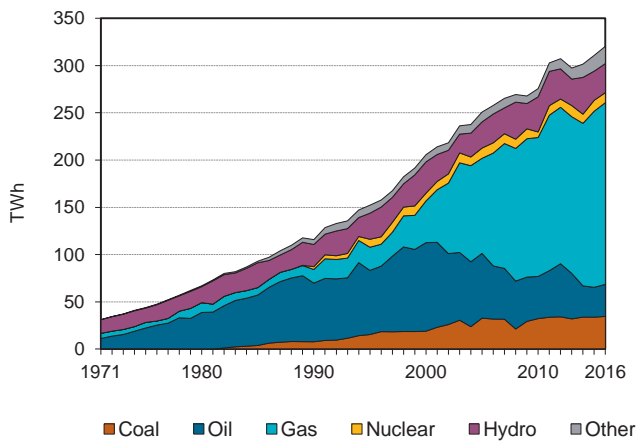


Figure 4. CO₂ from electricity generation: driving factors¹

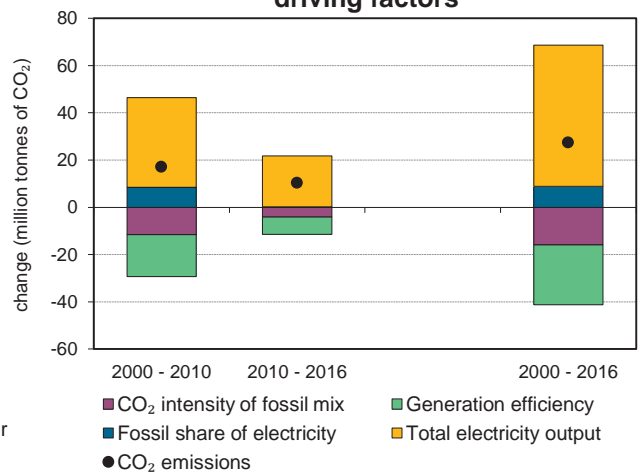


Figure 5. Changes in selected indicators

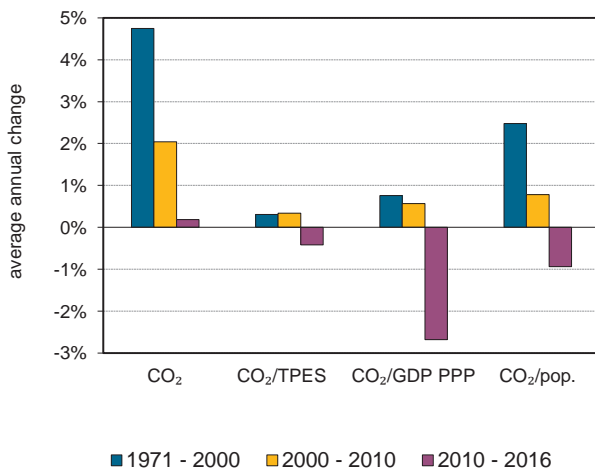
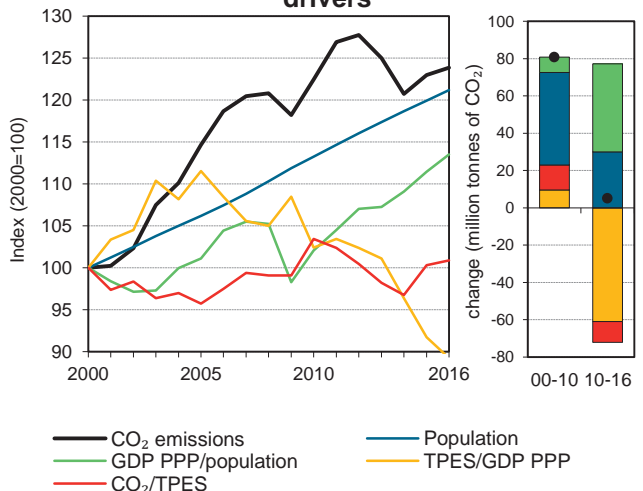


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Mexico

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	257	291.3	359.7	412.4	440.5	442.4	445.5	73%
Share of World CO ₂ from fuel combustion	1.3%	1.4%	1.6%	1.5%	1.4%	1.4%	1.4%	
TPES (PJ)	5179	5 518	6 315	7 561	7 475	7 741	7 752	50%
GDP (billion 2010 USD)	643.2	707.4	915.2	982.7	1 057.8	1 223.4	1 259.0	96%
GDP PPP (billion 2010 USD)	1060	1 165.8	1 508.2	1 619.5	1 743.2	2 016.1	2 074.8	96%
Population (millions)	87.1	94.5	100.9	107.2	114.3	121.0	122.3	40%
CO ₂ / TPES (tCO ₂ per TJ)	49.6	52.8	57.0	54.5	58.9	57.2	57.5	16%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	-11%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.24	0.3	0.2	0.3	0.3	0.2	0.2	-11%
CO ₂ / population (tCO ₂ per capita)	3	3.1	3.6	3.8	3.9	3.7	3.6	23%
Share of electricity output from fossil fuels	73%	71%	76%	81%	81%	81%	81%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	552	547	591	538	502	460	464	-16%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	113	140	160	171	172	173	73%
Population index	100	109	116	123	131	139	140	40%
GDP PPP per population index	100	101	123	124	125	137	139	39%
Energy intensity index - TPES / GDP PPP	100	97	86	96	88	79	76	-24%
Carbon intensity index - CO ₂ / TPES	100	106	115	110	119	115	116	16%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	47.7	251.5	146.2	0.1	445.5	73%
Electricity and heat generation	36.8	26.8	85.1	0.1	148.8	133%
Other energy industry own use	3.7	14.7	28.8	-	47.3	56%
Manufacturing industries and construction	7.2	24.8	30.0	-	61.9	16%
Transport	-	155.8	0.1	-	155.9	87%
<i>of which: road</i>	-	151.0	0.1	-	151.0	89%
Other	-	29.3	2.3	-	31.6	22%
<i>of which: residential</i>	-	15.4	1.7	-	17.1	-12%
<i>of which: services</i>	-	4.2	0.6	-	4.7	229%
<i>Memo: international marine bunkers</i>	-	2.8	-	-	2.8	x
<i>Memo: international aviation bunkers</i>	-	11.1	-	-	11.1	110%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	151.0	80.1	20.2	20.2
Main activity prod. elec. and heat - gas	63.0	8.1	8.4	28.7
Main activity prod. elec. and heat - coal	35.5	6.9	4.8	33.4
Manufacturing industries - gas	30.0	25.4	4.0	37.4
Other energy industry own use - gas	28.8	13.0	3.9	41.3
Manufacturing industries - oil	24.8	23.7	3.3	44.6
Unallocated autoproducers - gas	22.1	-	3.0	47.6
Main activity prod. elec. and heat - oil	21.4	49.0	2.9	50.4
Residential - oil	15.4	17.4	2.1	52.5
<i>Memo: total CO₂ from fuel combustion</i>	<i>445.5</i>	<i>257</i>	<i>59.7</i>	<i>59.7</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Republic of Moldova

Figure 1. CO₂ emissions by fuel

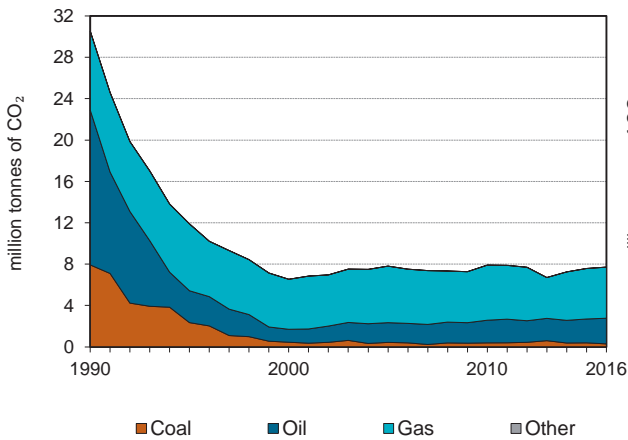


Figure 2. CO₂ emissions by sector

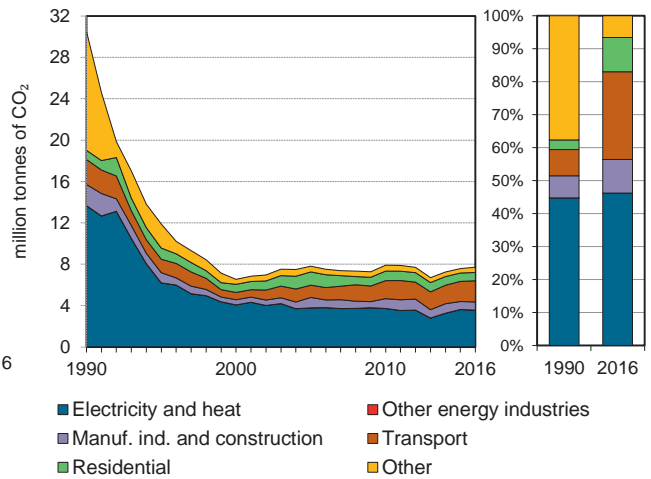


Figure 3. Electricity generation by fuel

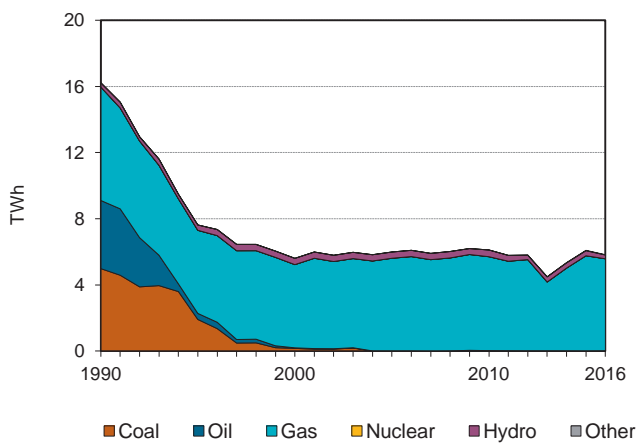


Figure 4. CO₂ from electricity generation: driving factors¹

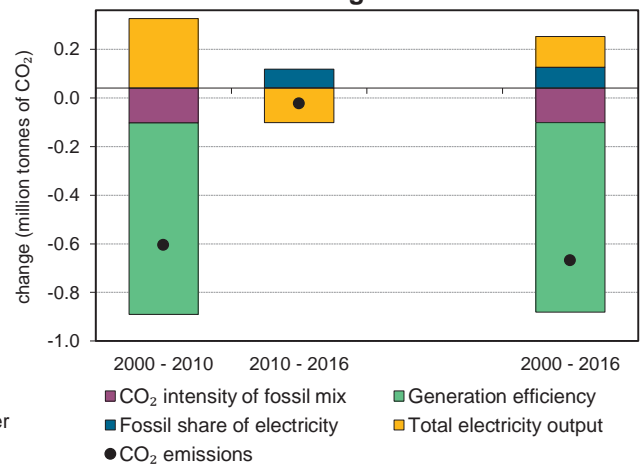


Figure 5. Changes in selected indicators

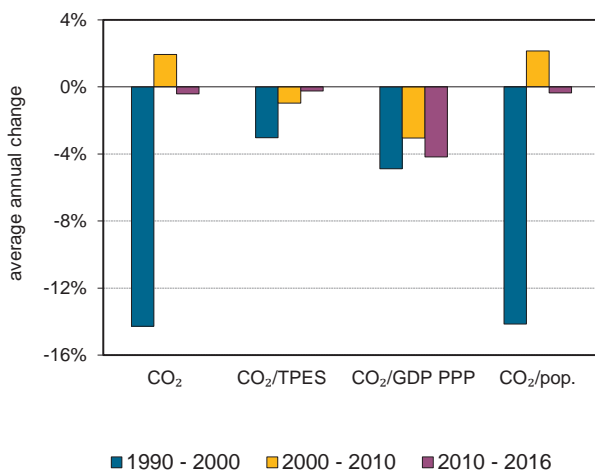
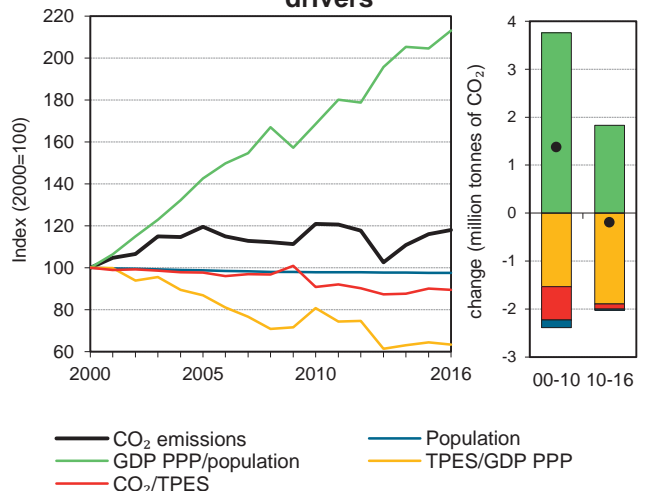


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Republic of Moldova

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	30.5	11.9	6.5	7.8	7.9	7.6	7.7	-75%
Share of World CO ₂ from fuel combustion	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	414	198	121	148	161	155	159	-62%
GDP (billion 2010 USD)	10	4.0	3.5	5.0	5.8	7.0	7.3	-26%
GDP PPP (billion 2010 USD)	23.4	9.4	8.3	11.7	13.6	16.5	17.2	-26%
Population (millions)	3.7	3.7	3.6	3.6	3.6	3.6	3.6	-4%
CO ₂ / TPES (tCO ₂ per TJ)	73.7	60.2	54.1	52.9	49.2	48.8	48.5	-34%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	3.06	3.0	1.9	1.6	1.4	1.1	1.1	-66%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	1.3	1.3	0.8	0.7	0.6	0.5	0.4	-66%
CO ₂ / population (tCO ₂ per capita)	8.3	3.2	1.8	2.2	2.2	2.1	2.2	-74%
Share of electricity output from fossil fuels	98%	96%	93%	94%	93%	95%	96%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	732	720	646	490	489	497	501	-32%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	39	21	26	26	25	25	-75%
Population index	100	99	98	97	96	96	96	-4%
GDP PPP per population index	100	40	36	51	61	73	76	-24%
Energy intensity index - TPES / GDP PPP	100	119	82	72	67	53	52	-48%
Carbon intensity index - CO ₂ / TPES	100	82	73	72	67	66	66	-34%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16	
CO₂ fuel combustion	0.3		2.5	4.9		7.7	-75%
Electricity and heat generation	0.0		0.0	3.5		3.6	-74%
Other energy industry own use	-		-	-		-	-100%
Manufacturing industries and construction	0.1		0.0	0.7		0.8	-61%
Transport	-		2.0	0.1		2.0	-15%
<i>of which: road</i>	-		1.9	0.0		2.0	-16%
Other	0.2		0.4	0.7		1.3	-89%
<i>of which: residential</i>	0.1		0.2	0.5		0.8	-9%
<i>of which: services</i>	0.1		0.0	0.2		0.3	+
<i>Memo: international marine bunkers</i>	-		-	-		-	-
<i>Memo: international aviation bunkers</i>	-		0.1	-		0.1	-56%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - gas	3.4	5.3	31.7	31.7
Road - oil	1.9	2.4	18.1	49.7
Manufacturing industries - gas	0.7	1.2	6.2	56.0
Residential - gas	0.5	0.5	4.6	60.6
Non-specified other - oil	0.2	8.3	2.2	62.8
Non-specified other - gas	0.2	0.5	1.9	64.7
Residential - oil	0.2	0.4	1.7	66.4
Residential - coal	0.1	-	1.1	67.5
Unallocated autoproducers - gas	0.1	-	0.9	68.4
<i>Memo: total CO₂ from fuel combustion</i>	<i>7.7</i>	<i>30.5</i>	<i>71.6</i>	<i>71.6</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Mongolia ¹

Figure 1. CO₂ emissions by fuel

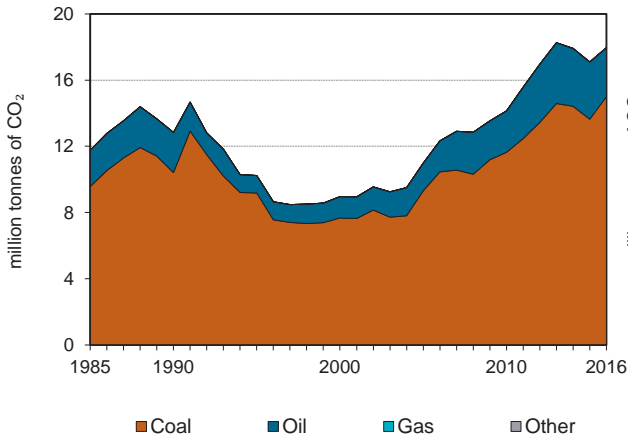


Figure 2. CO₂ emissions by sector

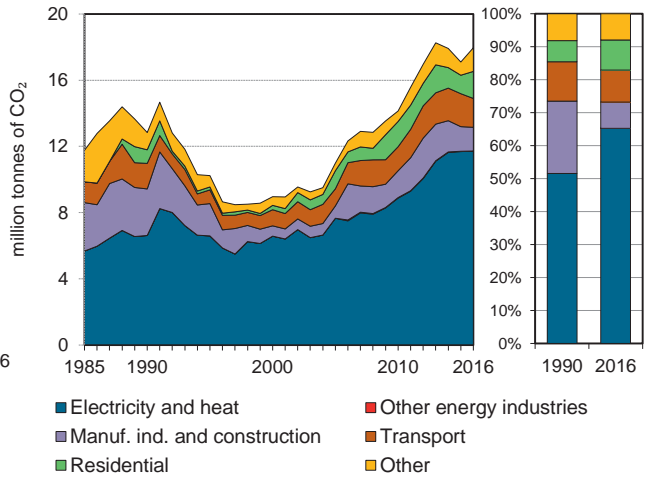


Figure 3. Electricity generation by fuel

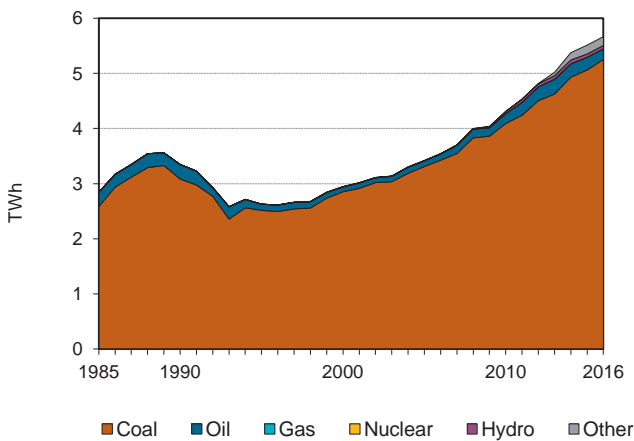


Figure 4. CO₂ from electricity generation: driving factors²

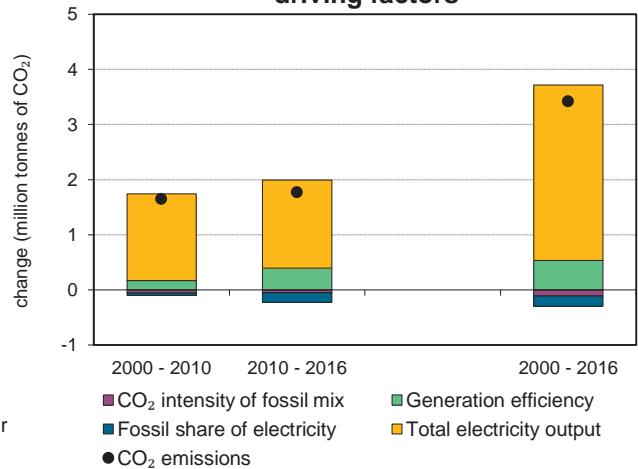


Figure 5. Changes in selected indicators

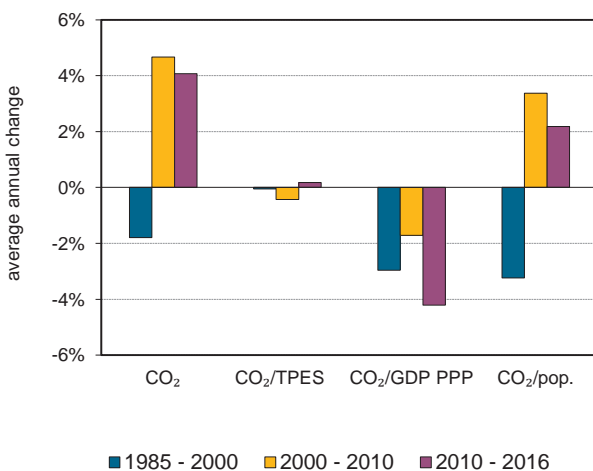
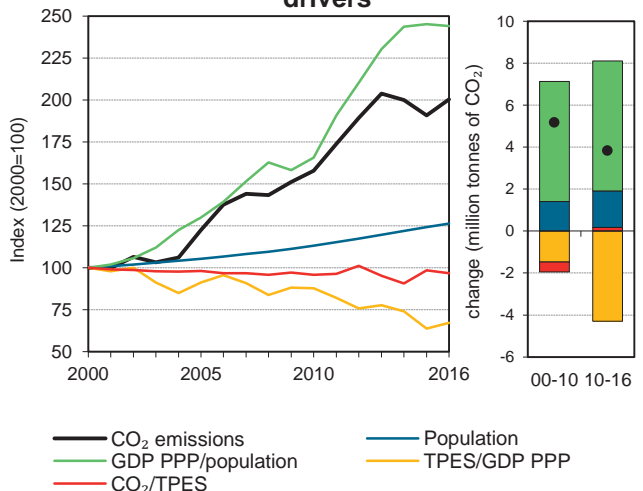


Figure 6. Total CO₂ emissions and drivers³



1. Prior to 1985, data for Mongolia were included in Other Asia.

2. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.

3. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Mongolia ¹

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	12.8	10.2	9.0	11.0	14.1	17.1	18.0	40%
Share of World CO ₂ from fuel combustion	0.1%	0.1%	0.0%	0.0%	0.1%	0.1%	0.1%	
TPES (PJ)	143	113	100	125	165	195	208	46%
GDP (billion 2010 USD)	3.9	3.4	3.8	5.3	7.2	11.7	11.8	207%
GDP PPP (billion 2010 USD)	11	9.6	10.9	15.0	20.5	33.3	33.7	207%
Population (millions)	2.2	2.3	2.4	2.5	2.7	3.0	3.0	39%
CO ₂ / TPES (tCO ₂ per TJ)	90	90.7	89.3	87.6	85.6	87.9	86.5	-4%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	3.34	3.1	2.3	2.1	2.0	1.5	1.5	-54%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	1.17	1.1	0.8	0.7	0.7	0.5	0.5	-54%
CO ₂ / population (tCO ₂ per capita)	5.9	4.5	3.7	4.3	5.2	5.7	5.9	1%
Share of electricity output from fossil fuels	100%	100%	100%	100%	99%	96%	96%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	731	1316	1137	1186	1159	1233	1195	63%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ²								
CO ₂ emissions index	100	80	70	86	110	133	140	40%
Population index	100	105	110	116	124	136	139	39%
GDP PPP per population index	100	83	91	118	150	223	222	122%
Energy intensity index - TPES / GDP PPP	100	91	71	64	62	45	47	-53%
Carbon intensity index - CO ₂ / TPES	100	101	99	97	95	98	96	-4%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ³	Total	%change 90-16
CO₂ fuel combustion	15.0	3.0	-	-	18.0	40%
Electricity and heat generation	11.5	0.2	-	-	11.7	77%
Other energy industry own use	0.0	-	-	-	0.0	x
Manufacturing industries and construction	0.5	0.9	-	-	1.4	-49%
Transport	0.1	1.7	-	-	1.7	13%
<i>of which: road</i>	-	1.3	-	-	1.3	15%
Other	2.9	0.1	-	-	3.1	64%
<i>of which: residential</i>	1.6	-	-	-	1.6	99%
<i>of which: services</i>	-	-	-	-	-	-100%
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.1	-	-	0.1	525%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ⁴ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	11.5	6.3	24.5	24.5
Residential - coal	1.6	0.8	3.5	27.9
Non-specified other sectors - coal	1.3	0.9	2.7	30.7
Road - oil	1.3	1.1	2.7	33.4
Manufacturing industries - oil	0.9	0.6	2.0	35.4
Manufacturing industries - coal	0.5	2.2	1.1	36.4
Other transport - oil	0.4	0.3	0.8	37.3
Main activity prod. elec. and heat - oil	0.2	0.3	0.4	37.7
Non-specified other - oil	0.1	0.1	0.3	38.0
<i>Memo: total CO₂ from fuel combustion</i>	<i>18.0</i>	<i>12.8</i>	<i>38.2</i>	<i>38.2</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Montenegro ¹

Figure 1. CO₂ emissions by fuel

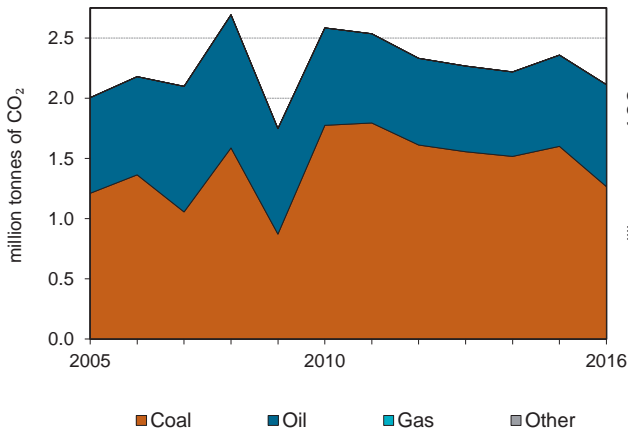


Figure 2. CO₂ emissions by sector

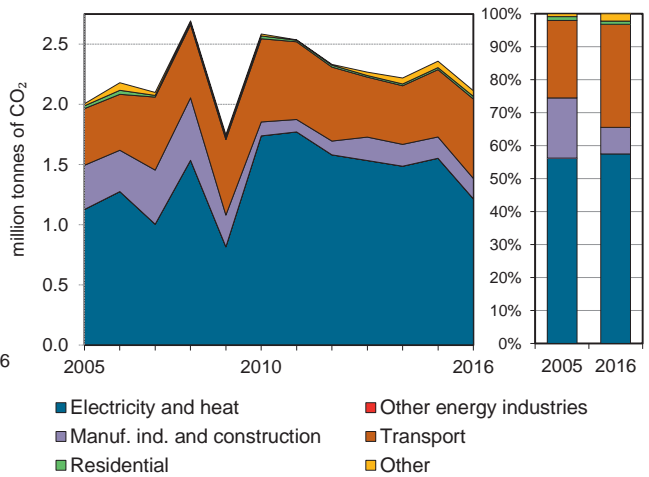


Figure 3. Electricity generation by fuel

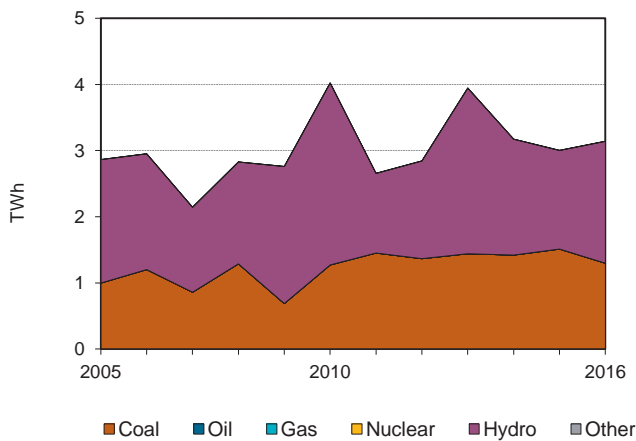


Figure 4. CO₂ from electricity generation: driving factors²

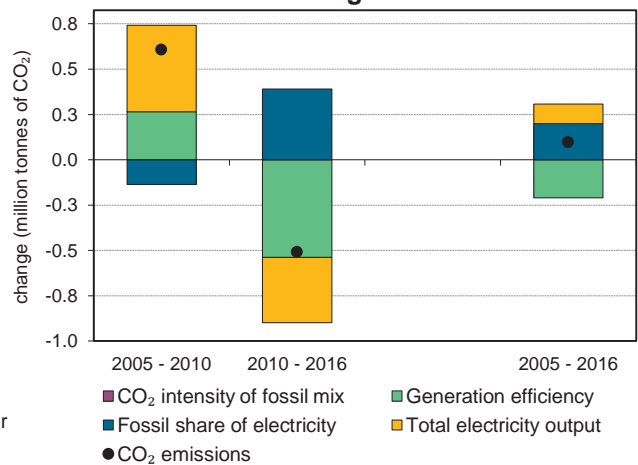


Figure 5. Changes in selected indicators

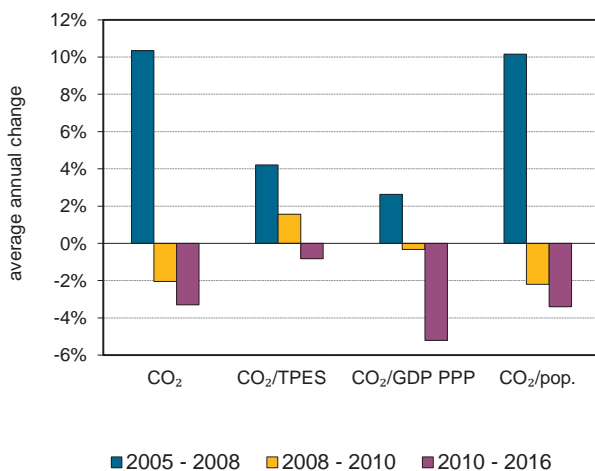
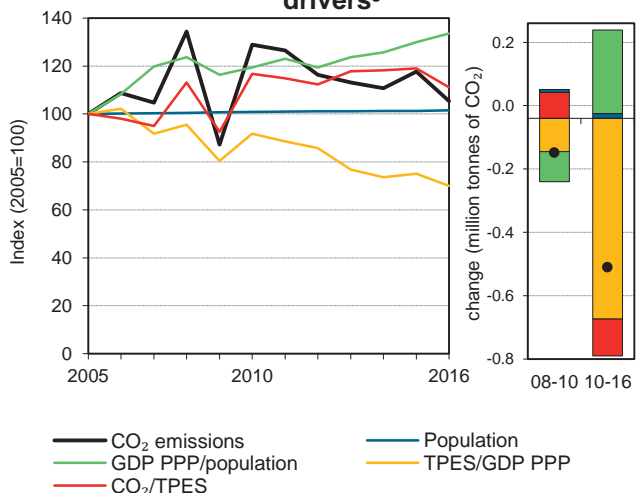


Figure 6. Total CO₂ emissions and drivers³



1. Prior to 2005, data for Montenegro were included in Serbia.

2. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.

3. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Montenegro ¹

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 05-16
CO ₂ fuel combustion (MtCO ₂)	2.0	2.6	2.4	2.1	5%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	43	47	42	41	-5%
GDP (billion 2010 USD)	3.3	4.1	4.5	4.6	39%
GDP PPP (billion 2010 USD)	7.0	8.5	9.3	9.5	36%
Population (millions)	0.6	0.6	0.6	0.6	1%
CO ₂ / TPES (tCO ₂ per TJ)	46.9	54.7	55.8	52.1	11%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.6	0.6	0.5	0.5	-24%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.3	0.3	0.3	0.2	-22%
CO ₂ / population (tCO ₂ per capita)	3.3	4.2	3.8	3.4	4%
Share of electricity output from fossil fuels	35%	32%	50%	41%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	391	430	517	387	-1%
CO₂ emissions and drivers - Kaya decomposition (2005=100) ²								
CO ₂ emissions index	100	129	118	105	5%
Population index	100	101	101	101	1%
GDP PPP per population index	100	119	130	134	34%
Energy intensity index - TPES / GDP PPP	100	92	75	70	-30%
Carbon intensity index - CO ₂ / TPES	100	117	119	111	11%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ³	Total	%change 05-16
CO₂ fuel combustion	1.3	0.8	-	-	2.1	5%
Electricity and heat generation	1.2	-	-	-	1.2	8%
Other energy industry own use	-	-	-	-	-	-
Manufacturing industries and construction	0.0	0.1	-	-	0.2	-54%
Transport	-	0.7	-	-	0.7	40%
<i>of which: road</i>	-	0.7	-	-	0.7	40%
Other	0.0	0.0	-	-	0.1	70%
<i>of which: residential</i>	0.0	0.0	-	-	0.0	-6%
<i>of which: services</i>	0.0	0.0	-	-	0.0	208%
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.1	-	-	0.1	46%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ⁴ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	1.2	1.1	..	..
Road - oil	0.7	0.5	..	..
Manufacturing industries - oil	0.1	0.3	..	..
Non-specified other - oil	0.0	0.0	..	..
Manufacturing industries - coal	0.0	0.1	..	..
Residential - coal	0.0	0.0	..	..
Other transport - oil	0.0	0.0	..	..
Non-specified other sectors - coal	0.0	0.0	..	..
Residential - oil	0.0	0.0	..	..
<i>Memo: total CO₂ from fuel combustion</i>	2.1	..	..	..

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Morocco

Figure 1. CO₂ emissions by fuel

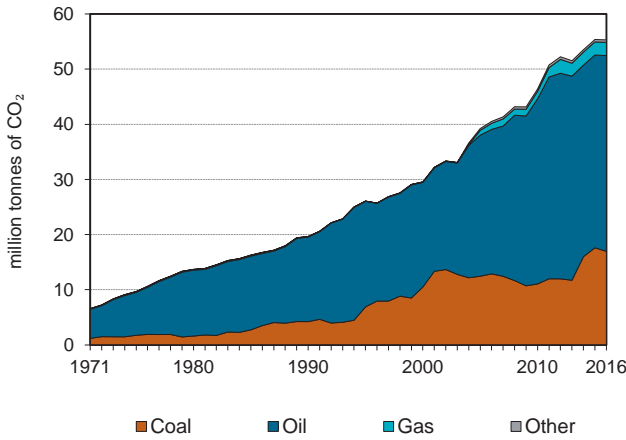


Figure 2. CO₂ emissions by sector

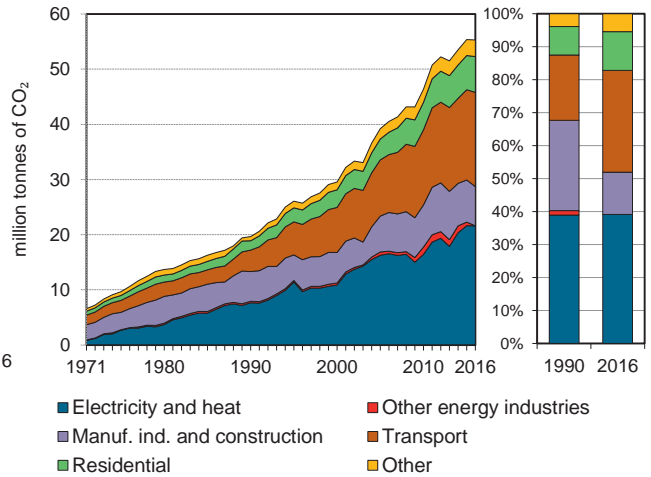


Figure 3. Electricity generation by fuel

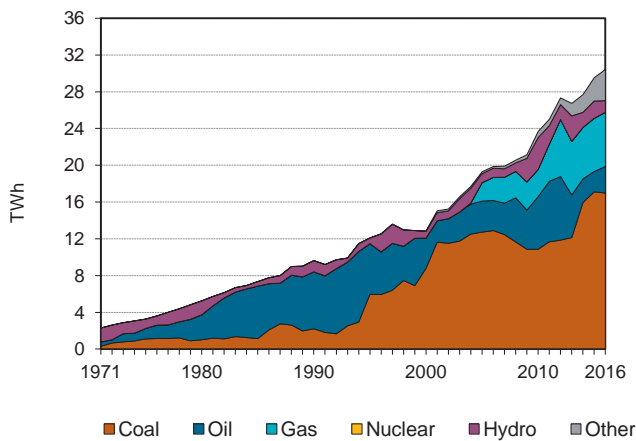


Figure 4. CO₂ from electricity generation: driving factors¹

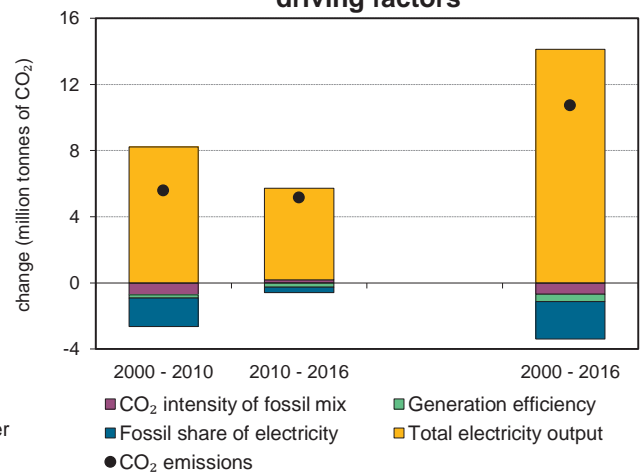


Figure 5. Changes in selected indicators

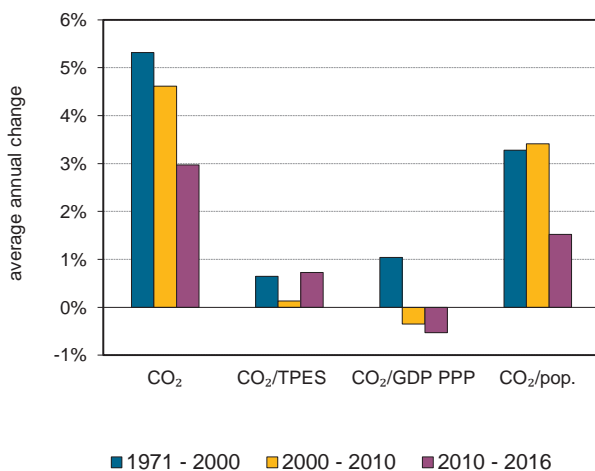
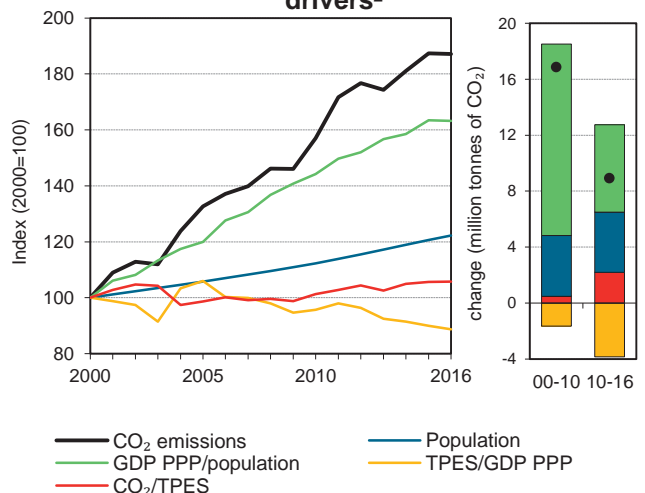


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Morocco

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	19.7	26.1	29.6	39.2	46.4	55.4	55.3	181%
Share of World CO ₂ from fuel combustion	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	
TPES (PJ)	319	391	461	621	715	818	816	156%
GDP (billion 2010 USD)	43.2	47.1	57.5	73.0	93.2	113.2	114.5	165%
GDP PPP (billion 2010 USD)	96.2	104.8	128.1	162.6	207.6	252.6	255.7	166%
Population (millions)	24.9	27.1	28.9	30.5	32.4	34.8	35.3	42%
CO ₂ / TPES (tCO ₂ per TJ)	61.6	66.7	64.1	63.2	64.9	67.7	67.7	10%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.46	0.6	0.5	0.5	0.5	0.5	0.5	6%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	6%
CO ₂ / population (tCO ₂ per capita)	0.8	1.0	1.0	1.3	1.4	1.6	1.6	98%
Share of electricity output from fossil fuels	87%	95%	94%	94%	83%	82%	81%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	794	943	846	843	695	702	681	-14%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	133	150	200	236	282	281	181%
Population index	100	109	116	123	130	140	142	42%
GDP PPP per population index	100	100	115	138	166	188	187	87%
Energy intensity index - TPES / GDP PPP	100	112	109	115	104	98	96	-4%
Carbon intensity index - CO ₂ / TPES	100	108	104	103	105	110	110	10%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	17.0		35.5	2.4	55.3	181%
Electricity and heat generation	16.9		2.4	-	21.6	183%
Other energy industry own use	-		-	-	-	-100%
Manufacturing industries and construction	0.1		6.5	0.4	7.1	32%
Transport	-		17.1	-	17.1	338%
<i>of which: road</i>	-		17.0	-	17.0	336%
Other	-		9.5	-	9.5	287%
<i>of which: residential</i>	-		6.5	-	6.5	284%
<i>of which: services</i>	-		0.4	-	0.4	526%
<i>Memo: international marine bunkers</i>	-		0.4	-	0.4	569%
<i>Memo: international aviation bunkers</i>	-		2.0	-	2.0	158%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	17.0	3.9	20.2	20.2
Main activity prod. elec. and heat - coal	16.9	2.8	20.2	40.4
Residential - oil	6.5	1.7	7.7	48.1
Manufacturing industries - oil	6.5	3.9	7.7	55.9
Non-specified other - oil	3.0	0.8	3.6	59.4
Main activity prod. elec. and heat - oil	2.4	3.8	2.9	62.3
Main activity prod. elec. and heat - gas	2.3	-	2.7	65.1
Manufacturing industries - other	0.4	-	0.5	65.6
Manufacturing industries - gas	0.1	0.1	0.2	65.7
<i>Memo: total CO₂ from fuel combustion</i>	<i>55.3</i>	<i>19.7</i>	<i>66.0</i>	<i>66.0</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Mozambique

Figure 1. CO₂ emissions by fuel

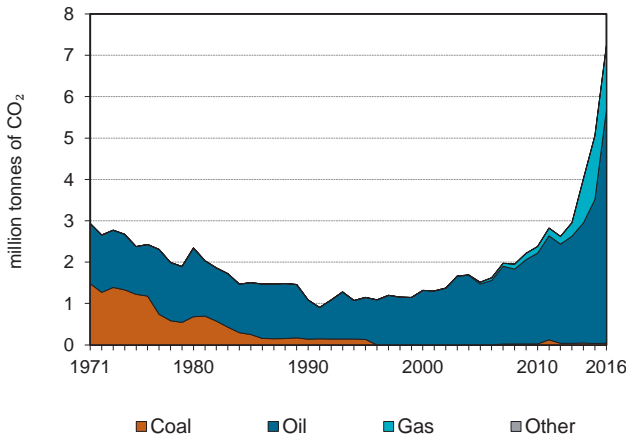


Figure 2. CO₂ emissions by sector

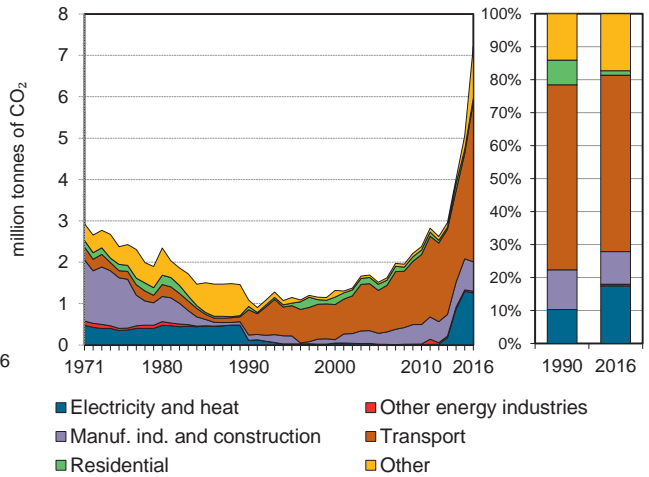


Figure 3. Electricity generation by fuel

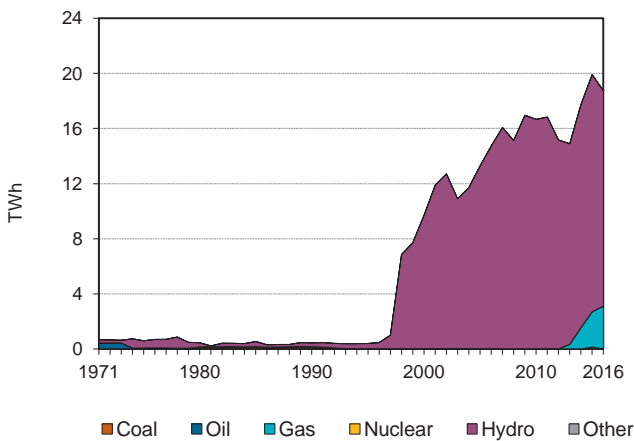


Figure 4. CO₂ from electricity generation: driving factors¹

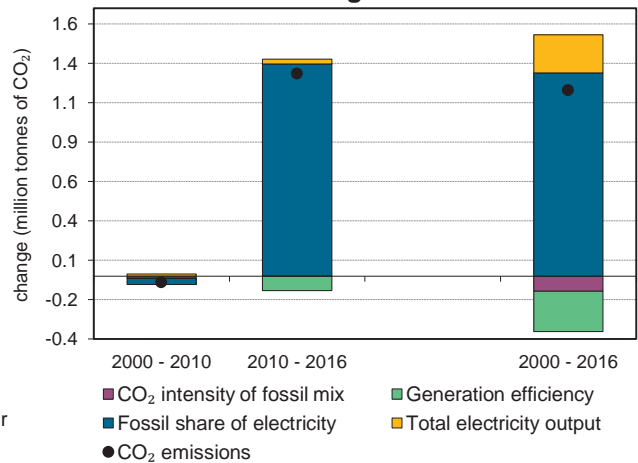


Figure 5. Changes in selected indicators

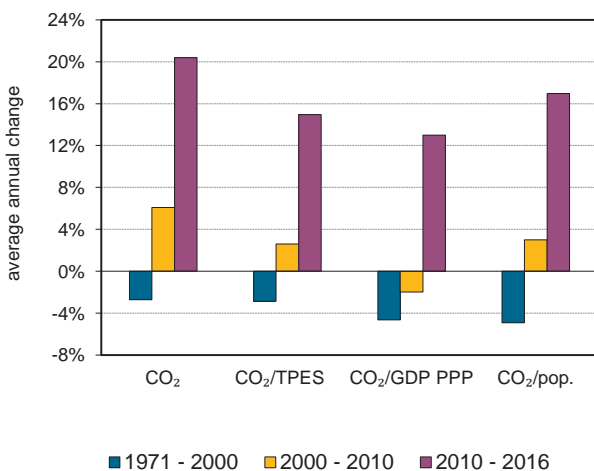
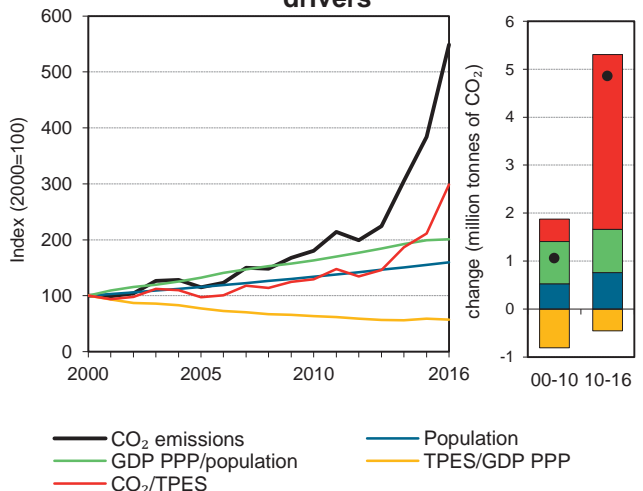


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Mozambique

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	1.1	1.1	1.3	1.5	2.4	5.1	7.2	567%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	248	263	300	355	419	546	552	123%
GDP (billion 2010 USD)	2.3	2.7	4.6	7.1	10.2	14.3	14.9	549%
GDP PPP (billion 2010 USD)	4.9	5.8	9.9	15.2	21.8	30.7	31.9	549%
Population (millions)	13.3	15.8	18.1	20.9	24.2	28.0	28.8	118%
CO ₂ / TPES (tCO ₂ per TJ)	4.4	4.4	4.4	4.3	5.7	9.3	13.1	200%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.47	0.4	0.3	0.2	0.2	0.4	0.5	3%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.22	0.2	0.1	0.1	0.1	0.2	0.2	3%
CO ₂ / population (tCO ₂ per capita)	0.1	0.1	0.1	0.1	0.1	0.2	0.3	206%
Share of electricity output from fossil fuels	37%	7%	1%	0%	0%	14%	17%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	245	65	5	1	1	65	67	-73%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	106	121	140	219	466	667	567%
Population index	100	119	136	158	183	211	218	118%
GDP PPP per population index	100	99	148	196	242	295	298	198%
Energy intensity index - TPES / GDP PPP	100	90	60	46	38	35	34	-66%
Carbon intensity index - CO ₂ / TPES	100	100	100	97	130	212	300	200%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.0	5.6	1.6	-	7.2	567%
Electricity and heat generation	-	0.0	1.2	-	1.3	+
Other energy industry own use	0.0	-	-	-	0.0	x
Manufacturing industries and construction	-	0.4	0.3	-	0.7	444%
Transport	-	3.9	0.0	-	3.9	536%
<i>of which: road</i>	-	3.7	0.0	-	3.7	590%
Other	-	1.3	0.0	-	1.3	475%
<i>of which: residential</i>	-	0.1	0.0	-	0.1	17%
<i>of which: services</i>	-	0.1	0.0	-	0.1	x
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-100%
<i>Memo: international aviation bunkers</i>	-	0.1	-	-	0.1	15%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	3.7	0.5	5.7	5.7
Non-specified other - oil	1.3	0.2	2.0	7.7
Main activity prod. elec. and heat - gas	1.2	-	1.9	9.6
Manufacturing industries - oil	0.4	0.1	0.6	10.2
Manufacturing industries - gas	0.3	-	0.5	10.7
Other transport - oil	0.2	0.1	0.3	11.0
Residential - oil	0.1	0.1	0.1	11.1
Other energy industry - coal	0.0	-	0.1	11.2
Main activity prod. elec. and heat - oil	0.0	0.1	0.0	11.2
<i>Memo: total CO₂ from fuel combustion</i>	7.2	1.1	11.3	11.3

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Myanmar

Figure 1. CO₂ emissions by fuel

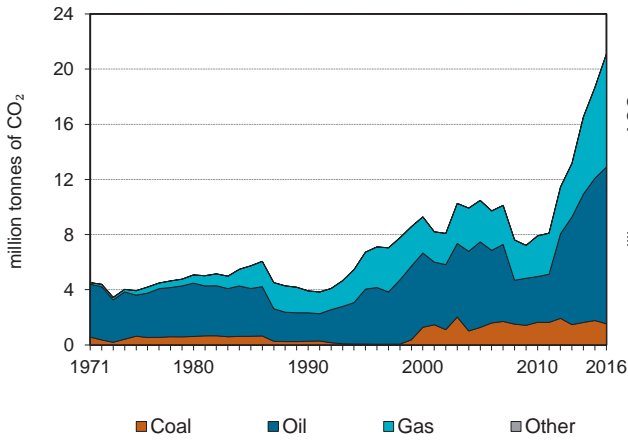


Figure 2. CO₂ emissions by sector

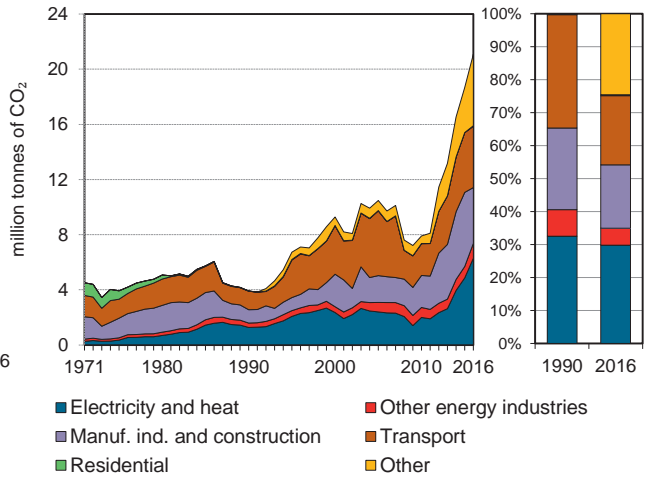


Figure 3. Electricity generation by fuel

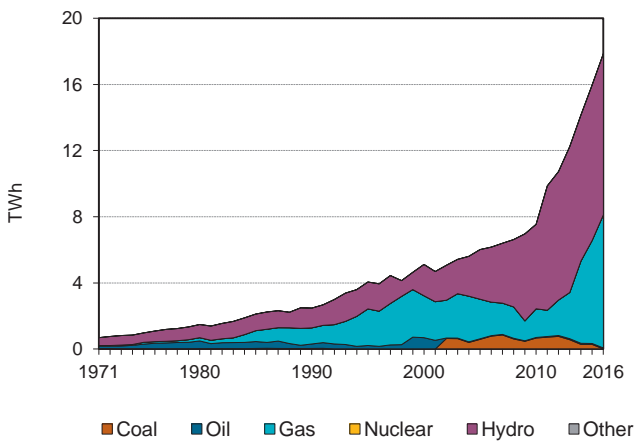


Figure 4. CO₂ from electricity generation: driving factors¹

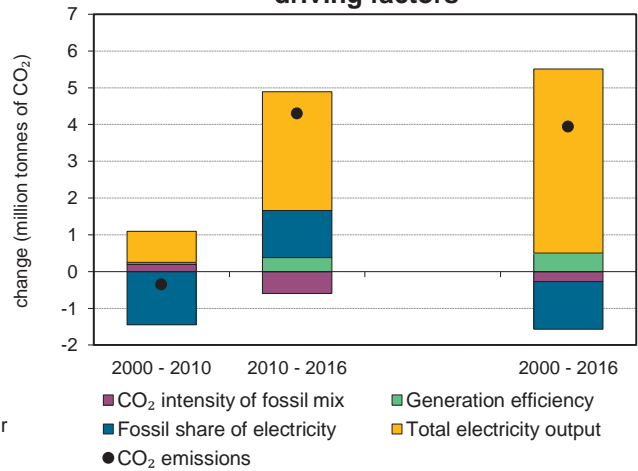


Figure 5. Changes in selected indicators

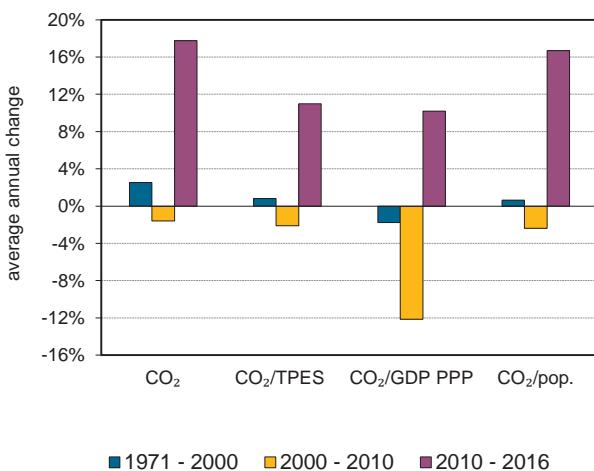
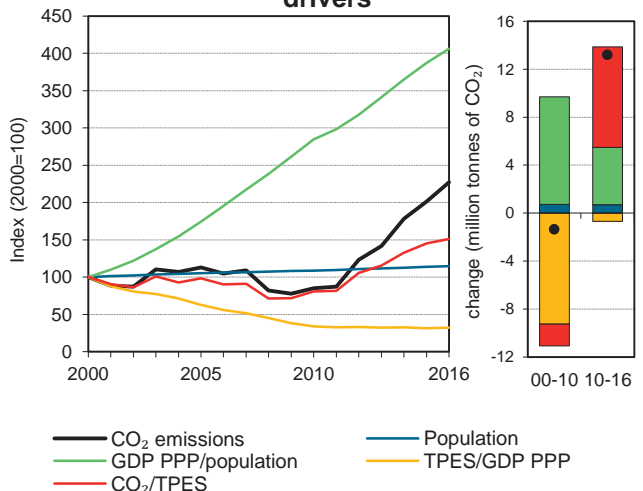


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Myanmar

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	3.9	6.7	9.3	10.5	7.9	18.7	21.1	439%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	
TPES (PJ)	447	494	538	618	566	744	808	81%
GDP (billion 2010 USD)	8	10.6	16.0	29.3	49.5	70.5	75.1	838%
GDP PPP (billion 2010 USD)	29.6	39.3	59.0	108.1	182.9	259.6	274.9	829%
Population (millions)	40.6	43.2	46.1	48.5	50.2	52.4	52.9	30%
CO ₂ / TPES (tCO ₂ per TJ)	8.8	13.6	17.3	17.0	14.0	25.1	26.1	198%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.49	0.6	0.6	0.4	0.2	0.3	0.3	-43%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.13	0.2	0.2	0.1	0.0	0.1	0.1	-42%
CO ₂ / population (tCO ₂ per capita)	0.1	0.2	0.2	0.2	0.2	0.4	0.4	316%
Share of electricity output from fossil fuels	52%	60%	63%	50%	32%	41%	46%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	513	511	460	399	265	304	352	-31%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	172	237	268	202	477	539	439%
Population index	100	106	113	119	123	129	130	30%
GDP PPP per population index	100	125	176	306	501	681	714	614%
Energy intensity index - TPES / GDP PPP	100	83	60	38	20	19	19	-81%
Carbon intensity index - CO ₂ / TPES	100	155	197	194	160	287	298	198%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	1.5	11.4	8.2	-	21.1	439%
Electricity and heat generation	0.0	0.0	6.2	-	6.3	395%
Other energy industry own use	-	0.1	1.0	-	1.1	238%
Manufacturing industries and construction	1.3	2.1	0.6	-	4.0	318%
Transport	-	4.1	0.4	-	4.4	230%
<i>of which: road</i>	-	2.8	0.4	-	3.1	146%
Other	0.2	5.1	0.0	-	5.2	+
<i>of which: residential</i>	-	0.0	-	-	0.0	410%
<i>of which: services</i>	0.0	0.9	-	-	0.9	x
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.3	-	-	0.3	+

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - gas	6.2	1.0	4.3	4.3
Non-specified other - oil	5.0	0.0	3.4	7.7
Road - oil	2.8	1.3	1.9	9.6
Manufacturing industries - oil	2.1	0.4	1.4	11.0
Manufacturing industries - coal	1.3	0.2	0.9	11.9
Other transport - oil	1.3	0.1	0.9	12.8
Other energy industry own use - gas	1.0	0.2	0.7	13.5
Manufacturing industries - gas	0.6	0.3	0.4	13.9
Road - gas	0.4	0.0	0.3	14.2
<i>Memo: total CO₂ from fuel combustion</i>	<i>21.1</i>	<i>3.9</i>	<i>14.4</i>	<i>14.4</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Namibia ¹

Figure 1. CO₂ emissions by fuel

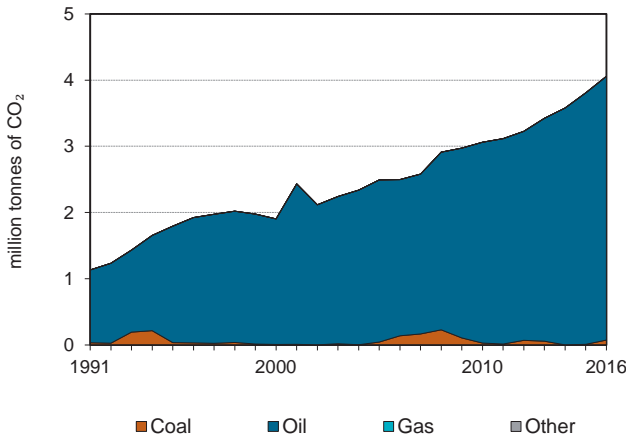


Figure 2. CO₂ emissions by sector

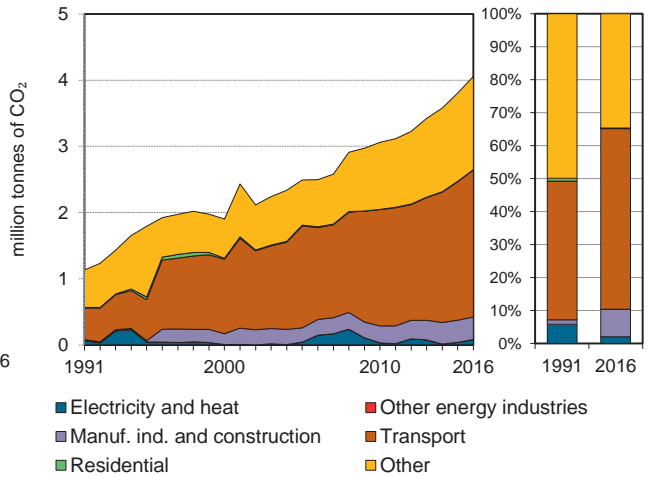


Figure 3. Electricity generation by fuel

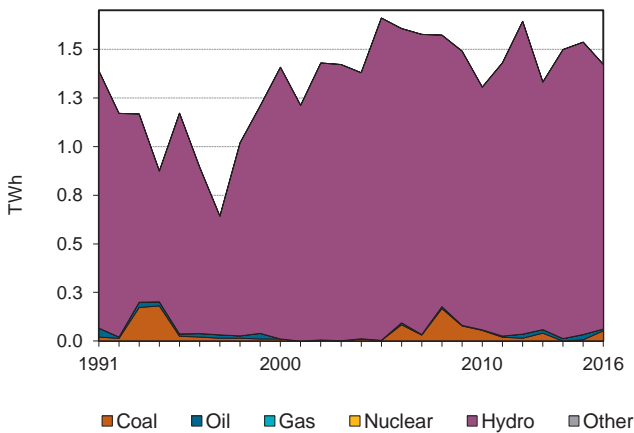


Figure 4. CO₂ from electricity generation: driving factors²

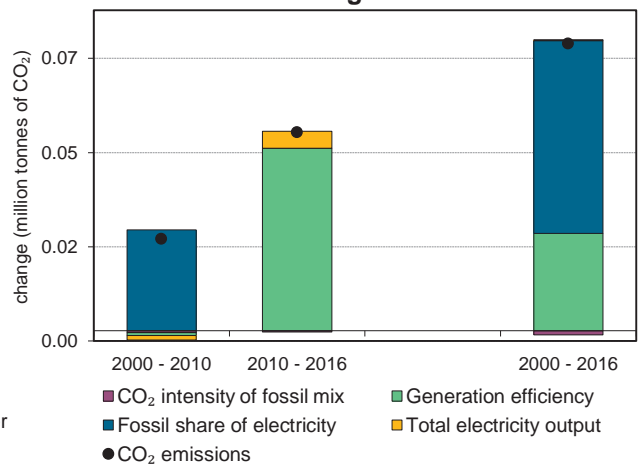


Figure 5. Changes in selected indicators

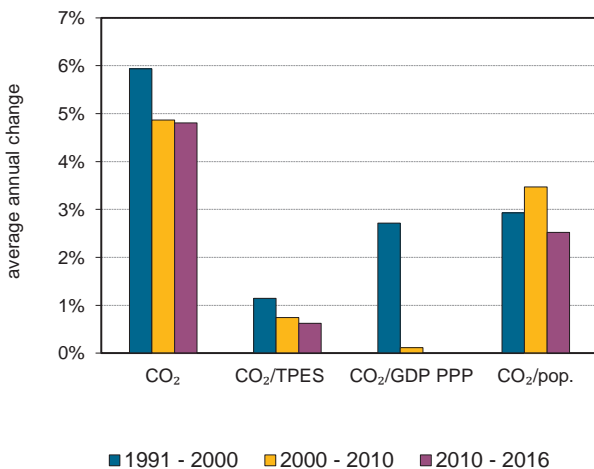
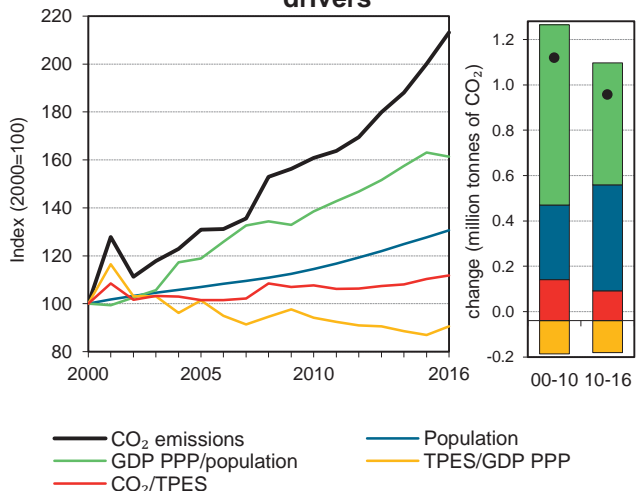


Figure 6. Total CO₂ emissions and drivers³



1. Prior to 1991, data for Namibia were included in Other Africa.

2. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.

3. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Namibia ¹

Key indicators

	1990	1991	2000	2005	2010	2015	2016	%change 91-16
CO ₂ fuel combustion (MtCO ₂)	..	1.1	1.9	2.5	3.1	3.8	4.1	258%
Share of World CO ₂ from fuel combustion	..	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	..	29	44	57	66	80	84	189%
GDP (billion 2010 USD)	..	5.4	7.1	9.1	11.3	14.8	14.9	178%
GDP PPP (billion 2010 USD)	..	8.6	11.4	14.5	18.0	23.7	23.9	179%
Population (millions)	..	1.5	1.9	2.0	2.2	2.4	2.5	69%
CO ₂ / TPES (tCO ₂ per TJ)	..	38.8	43.0	43.6	46.3	47.4	48.1	24%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	..	0.2	0.3	0.3	0.3	0.3	0.3	29%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	..	0.1	0.2	0.2	0.2	0.2	0.2	29%
CO ₂ / population (tCO ₂ per capita)	..	0.8	1.0	1.2	1.4	1.6	1.6	112%
Share of electricity output from fossil fuels	..	5%	1%	0%	4%	2%	4%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	..	47	5	26	24	25	58	23%
CO₂ emissions and drivers - Kaya decomposition (1991=100) ²								
CO ₂ emissions index	..	100	168	220	270	336	358	258%
Population index	..	100	130	139	148	165	169	69%
GDP PPP per population index	..	100	102	122	142	167	165	65%
Energy intensity index - TPES / GDP PPP	..	100	115	116	108	100	104	4%
Carbon intensity index - CO ₂ / TPES	..	100	111	112	119	122	124	24%

1. Prior to 1991, data for Namibia were included in Other Africa. 2. Please see Part I for methodological notes.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ³	Total	%change 91-16
CO₂ fuel combustion	0.1	4.0	-	-	4.1	258%
Electricity and heat generation	0.1	0.0	-	-	0.1	26%
Other energy industry own use	-	-	-	-	-	-
Manufacturing industries and construction	-	0.3	-	-	0.3	+
Transport	-	2.2	-	-	2.2	365%
<i>of which: road</i>	-	2.1	-	-	2.1	363%
Other	-	1.4	-	-	1.4	146%
<i>of which: residential</i>	-	0.0	-	-	0.0	-33%
<i>of which: services</i>	-	0.0	-	-	0.0	x
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.1	-	-	0.1	46%

3. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ⁴ (%)	Cumulative total (%)
Road - oil	2.1	0.5	18.1	18.1
Non-specified other - oil	1.4	0.6	12.0	30.1
Manufacturing industries - oil	0.3	0.0	2.9	33.0
Other transport - oil	0.1	0.0	0.9	33.9
Main activity prod. elec. and heat - coal	0.1	0.0	0.6	34.5
Main activity prod. elec. and heat - oil	0.0	0.0	0.1	34.6
Residential - oil	0.0	0.0	0.1	34.6
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	4.1	..	34.6	34.6

4. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Nepal

Figure 1. CO₂ emissions by fuel

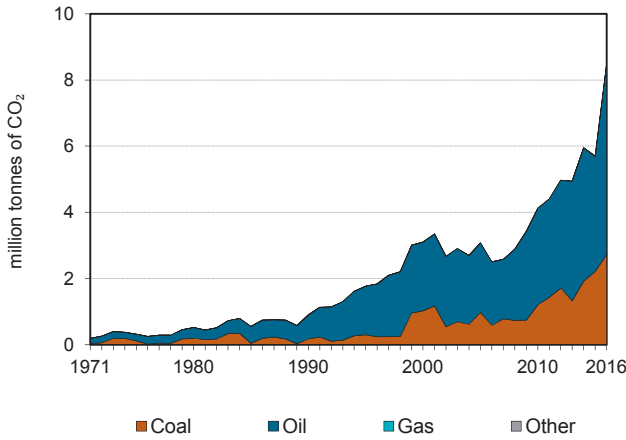


Figure 2. CO₂ emissions by sector

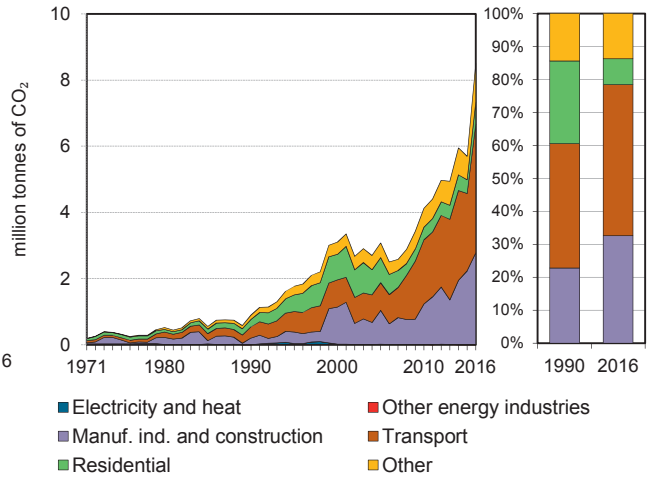


Figure 3. Electricity generation by fuel

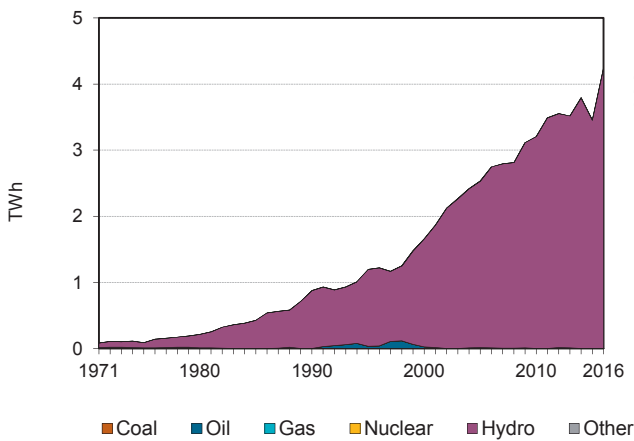


Figure 4. CO₂ from electricity generation: driving factors¹

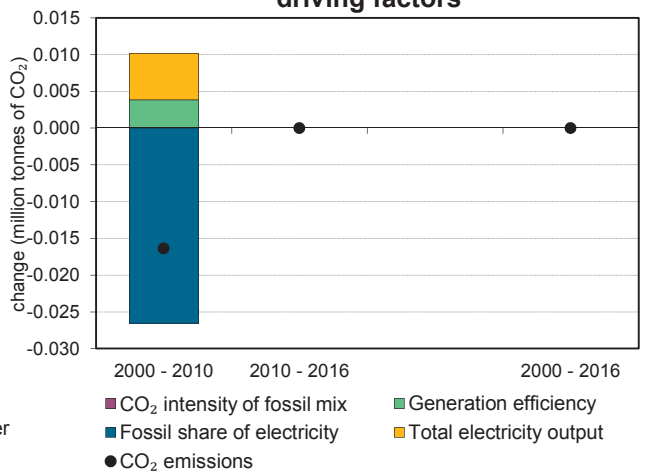


Figure 5. Changes in selected indicators

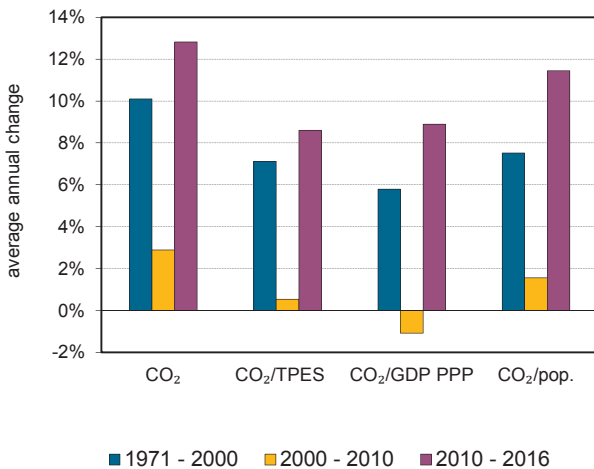
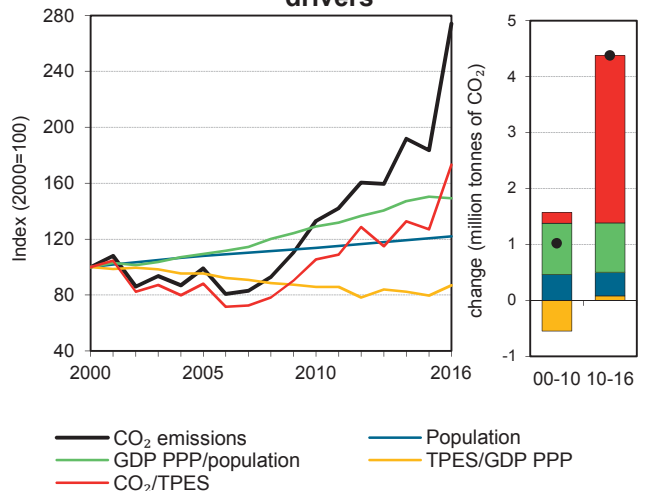


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Nepal

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	0.9	1.8	3.1	3.1	4.1	5.7	8.5	850%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	242	281	340	382	428	491	537	122%
GDP (billion 2010 USD)	6.7	8.6	10.9	12.9	16.0	19.7	19.8	195%
GDP PPP (billion 2010 USD)	22	28.3	35.8	42.3	52.6	65.0	65.2	196%
Population (millions)	18.8	21.4	23.7	25.6	27.0	28.7	29.0	55%
CO ₂ / TPES (tCO ₂ per TJ)	3.7	6.3	9.1	8.0	9.6	11.6	15.8	328%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.13	0.2	0.3	0.2	0.3	0.3	0.4	221%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.04	0.1	0.1	0.1	0.1	0.1	0.1	217%
CO ₂ / population (tCO ₂ per capita)	0.1	0.1	0.1	0.1	0.2	0.2	0.3	510%
Share of electricity output from fossil fuels	0%	3%	2%	1%	0%	0%	0%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	0	26	12	5	1	-	-	0%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	197	346	343	460	636	950	850%
Population index	100	114	127	137	144	153	155	55%
GDP PPP per population index	100	113	129	141	166	193	192	92%
Energy intensity index - TPES / GDP PPP	100	90	86	82	74	69	75	-25%
Carbon intensity index - CO ₂ / TPES	100	170	247	218	261	314	428	328%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	2.7	5.8	-	-	8.5	850%
Electricity and heat generation	-	-	-	-	-	-
Other energy industry own use	-	-	-	-	-	-
Manufacturing industries and construction	2.7	0.1	-	-	2.8	+
Transport	-	3.9	-	-	3.9	+
<i>of which: road</i>	-	3.9	-	-	3.9	+
Other	0.0	1.8	-	-	1.8	418%
<i>of which: residential</i>	0.0	0.7	-	-	0.7	197%
<i>of which: services</i>	-	0.5	-	-	0.5	+
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.4	-	-	0.4	753%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	3.9	0.3	8.7	8.7
Manufacturing industries - coal	2.7	0.2	6.1	14.9
Non-specified other - oil	1.2	0.1	2.6	17.5
Residential - oil	0.7	0.2	1.5	18.9
Manufacturing industries - oil	0.1	0.0	0.1	19.1
Residential - coal	0.0	-	0.0	19.1
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	8.5	0.9	19.1	19.1

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Netherlands

Figure 1. CO₂ emissions by fuel

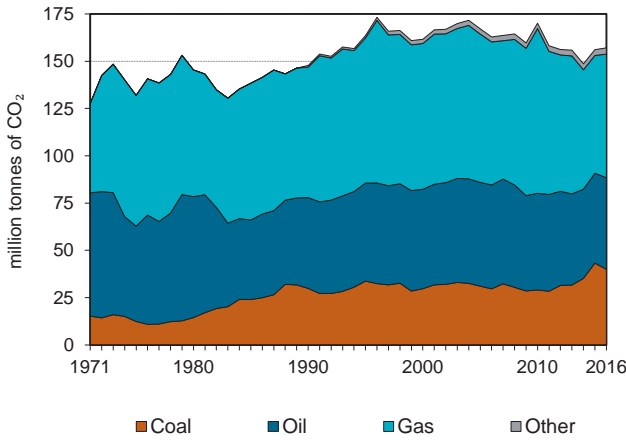


Figure 2. CO₂ emissions by sector

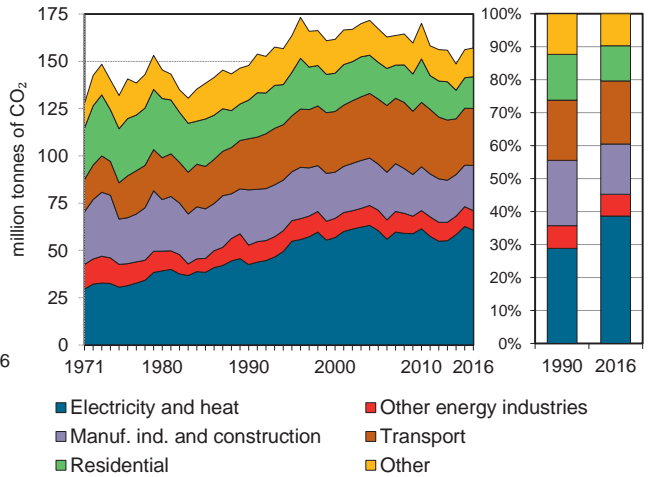


Figure 3. Electricity generation by fuel

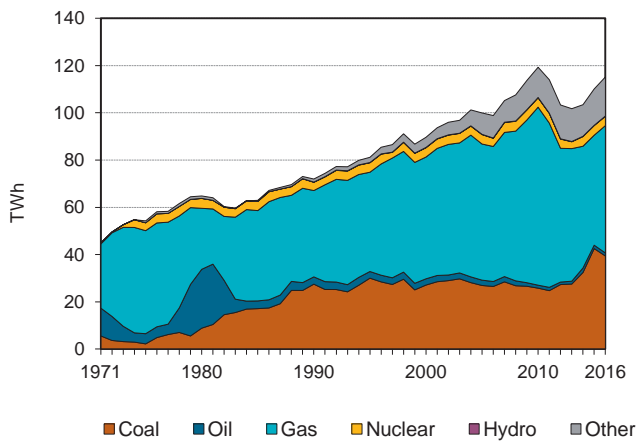


Figure 4. CO₂ from electricity generation: driving factors¹

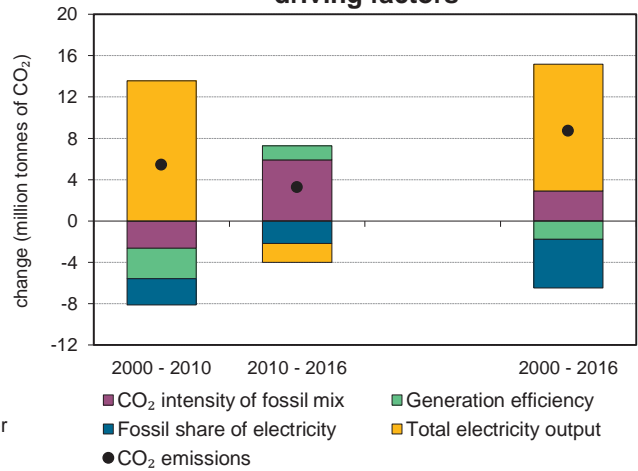


Figure 5. Changes in selected indicators

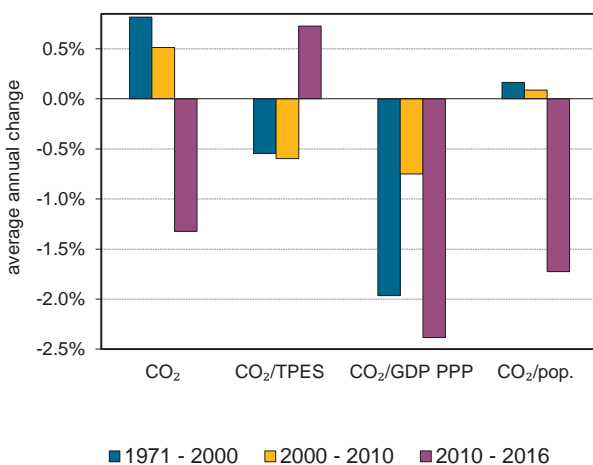
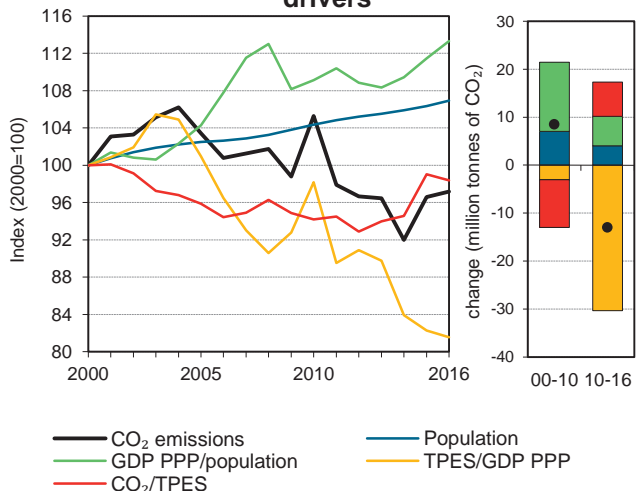


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Netherlands

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	147.8	163.6	161.6	167.2	170.1	156.1	157.1	6%
Share of World CO ₂ from fuel combustion	0.7%	0.8%	0.7%	0.6%	0.6%	0.5%	0.5%	
TPES (PJ)	2814	3 092	3 159	3 408	3 530	3 081	3 121	11%
GDP (billion 2010 USD)	530.5	594.2	734.7	785.1	836.4	870.9	890.1	68%
GDP PPP (billion 2010 USD)	469.9	526.3	650.7	695.4	740.8	771.4	788.4	68%
Population (millions)	15	15.5	15.9	16.3	16.6	16.9	17.0	14%
CO ₂ / TPES (tCO ₂ per TJ)	52.5	52.9	51.2	49.0	48.2	50.7	50.3	-4%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.28	0.3	0.2	0.2	0.2	0.2	0.2	-37%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.31	0.3	0.2	0.2	0.2	0.2	0.2	-37%
CO ₂ / population (tCO ₂ per capita)	9.9	10.6	10.2	10.2	10.2	9.2	9.2	-7%
Share of electricity output from fossil fuels	94%	93%	92%	88%	87%	84%	84%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	545	561	500	479	421	489	464	-15%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	111	109	113	115	106	106	6%
Population index	100	103	107	109	111	113	114	14%
GDP PPP per population index	100	108	130	136	142	145	147	47%
Energy intensity index - TPES / GDP PPP	100	98	81	82	80	67	66	-34%
Carbon intensity index - CO ₂ / TPES	100	101	97	93	92	96	96	-4%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	40.0	48.4	65.4	3.3	157.1	6%
Electricity and heat generation	34.8	1.5	21.3	3.2	60.7	43%
Other energy industry own use	0.7	6.3	3.2	-	10.3	0%
Manufacturing industries and construction	4.4	8.1	11.4	-	23.9	-18%
Transport	-	30.0	0.1	-	30.1	11%
<i>of which: road</i>	-	28.9	0.1	-	29.0	11%
Other	0.0	2.5	29.3	0.1	32.0	-17%
<i>of which: residential</i>	0.0	0.1	16.7	-	16.8	-18%
<i>of which: services</i>	0.0	0.5	7.5	0.1	8.1	-2%
<i>Memo: international marine bunkers</i>	-	39.3	0.0	-	39.3	12%
<i>Memo: international aviation bunkers</i>	-	11.5	-	-	11.5	153%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	34.7	23.0	18.1	18.1
Road - oil	28.9	26.1	15.1	33.2
Main activity prod. elec. and heat - gas	16.8	13.1	8.8	41.9
Residential - gas	16.7	19.7	8.7	50.6
Non-specified other - gas	12.7	14.8	6.6	57.2
Manufacturing industries - gas	11.4	15.9	6.0	63.2
Manufacturing industries - oil	8.1	7.5	4.2	67.4
Other energy industry own use - oil	6.3	7.6	3.3	70.7
Unallocated autoproducers - gas	4.5	3.5	2.3	73.0
<i>Memo: total CO₂ from fuel combustion</i>	<i>157.1</i>	<i>147.8</i>	<i>81.9</i>	<i>81.9</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

New Zealand

Figure 1. CO₂ emissions by fuel

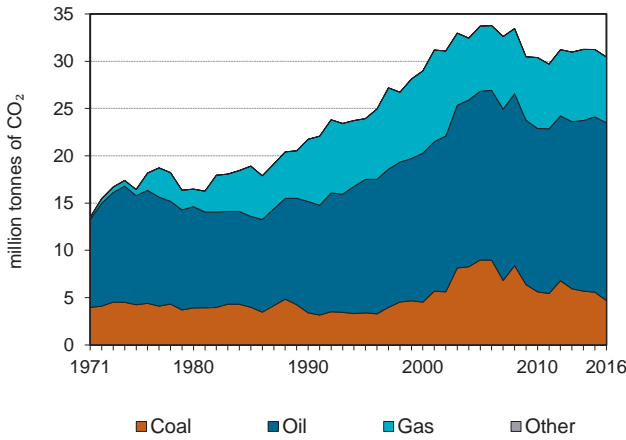


Figure 2. CO₂ emissions by sector

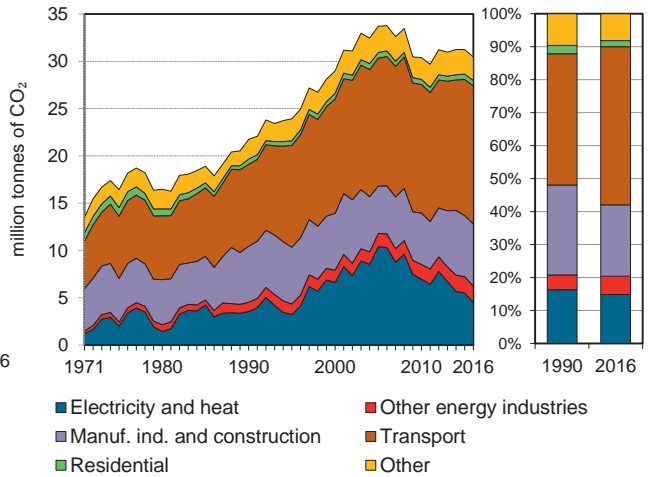


Figure 3. Electricity generation by fuel

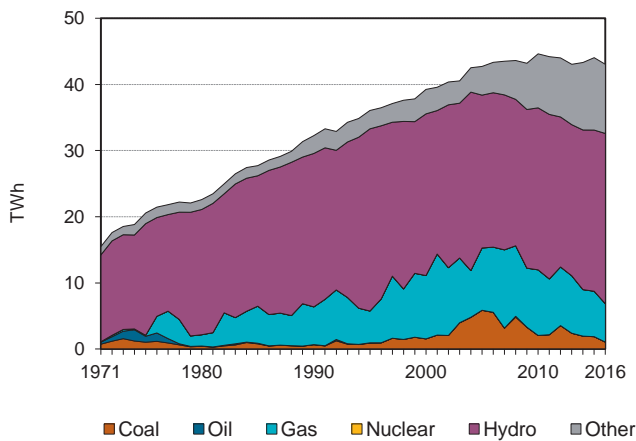


Figure 4. CO₂ from electricity generation: driving factors¹

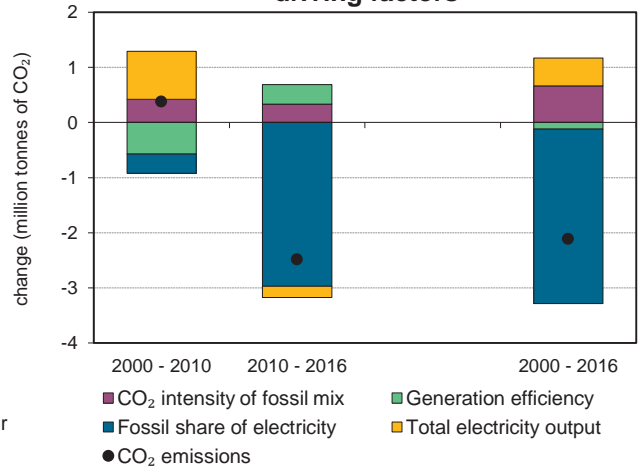


Figure 5. Changes in selected indicators

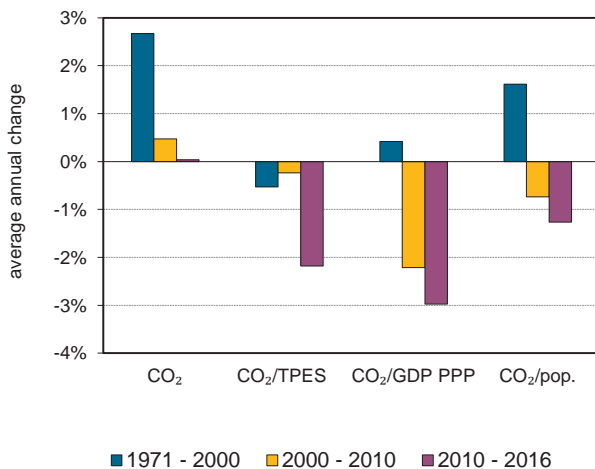
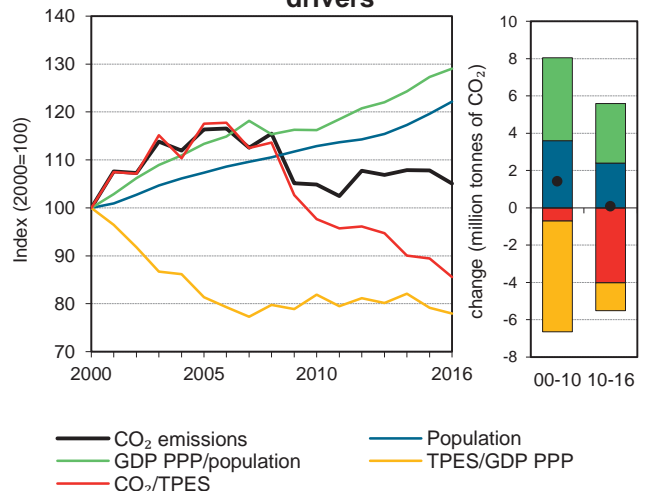


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

New Zealand

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	21.8	23.9	29.0	33.7	30.4	31.2	30.5	40%
Share of World CO ₂ from fuel combustion	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	
TPES (PJ)	537	624	716	709	769	863	880	64%
GDP (billion 2010 USD)	82.7	96.5	111.8	136.0	146.6	170.2	176.1	113%
GDP PPP (billion 2010 USD)	76.7	89.6	103.7	126.2	136.0	158.0	163.4	113%
Population (millions)	3.4	3.7	3.9	4.1	4.4	4.6	4.7	40%
CO ₂ / TPES (tCO ₂ per TJ)	40.5	38.4	40.5	47.6	39.5	36.2	34.6	-14%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.26	0.2	0.3	0.2	0.2	0.2	0.2	-34%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.28	0.3	0.3	0.3	0.2	0.2	0.2	-34%
CO ₂ / population (tCO ₂ per capita)	6.5	6.5	7.5	8.1	7.0	6.8	6.5	0%
Share of electricity output from fossil fuels	20%	16%	28%	36%	27%	20%	16%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	110	90	168	243	156	125	105	-4%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	110	133	155	140	144	140	40%
Population index	100	109	115	123	129	137	140	40%
GDP PPP per population index	100	107	118	134	137	150	152	52%
Energy intensity index - TPES / GDP PPP	100	99	99	80	81	78	77	-23%
Carbon intensity index - CO ₂ / TPES	100	95	100	118	98	89	86	-14%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	4.7	18.8	7.0	-	30.5	40%
Electricity and heat generation	1.9	0.0	2.6	-	4.5	27%
Other energy industry own use	0.4	0.8	0.5	-	1.7	73%
Manufacturing industries and construction	2.1	1.4	3.1	-	6.6	11%
Transport	-	14.6	0.0	-	14.6	69%
<i>of which: road</i>	-	13.3	0.0	-	13.3	80%
Other	0.2	2.0	0.8	-	3.0	15%
<i>of which: residential</i>	0.0	0.2	0.3	-	0.6	0%
<i>of which: services</i>	0.1	0.5	0.4	-	1.0	10%
<i>Memo: international marine bunkers</i>	-	1.0	-	-	1.0	-8%
<i>Memo: international aviation bunkers</i>	-	2.6	-	-	2.6	95%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	13.3	7.3	16.7	16.7
Manufacturing industries - gas	3.1	2.9	3.9	20.5
Main activity prod. elec. and heat - gas	2.5	2.9	3.1	23.6
Manufacturing industries - coal	2.1	2.2	2.7	26.3
Non-specified other - oil	1.8	1.6	2.2	28.5
Unallocated autoproducers - coal	1.5	0.1	1.9	30.4
Manufacturing industries - oil	1.4	0.9	1.7	32.1
Other transport - oil	1.3	1.2	1.6	33.7
Other energy industry own use - oil	0.8	0.7	1.0	34.8
<i>Memo: total CO₂ from fuel combustion</i>	<i>30.5</i>	<i>21.8</i>	<i>38.1</i>	<i>38.1</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Nicaragua

Figure 1. CO₂ emissions by fuel

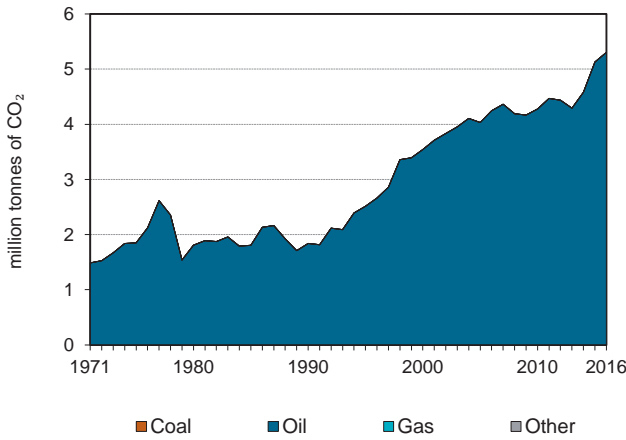


Figure 2. CO₂ emissions by sector

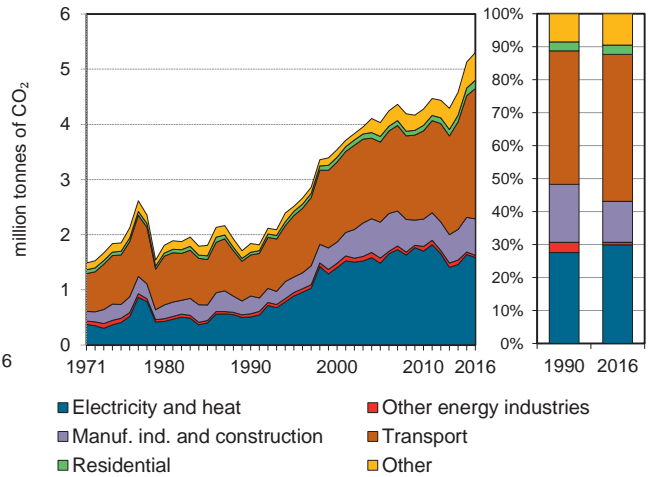


Figure 3. Electricity generation by fuel

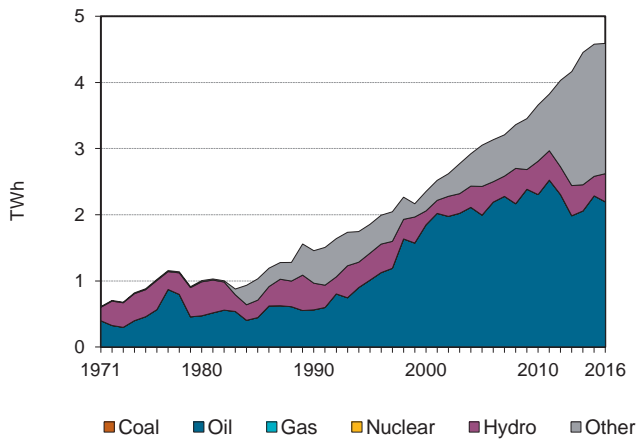


Figure 4. CO₂ from electricity generation: driving factors¹

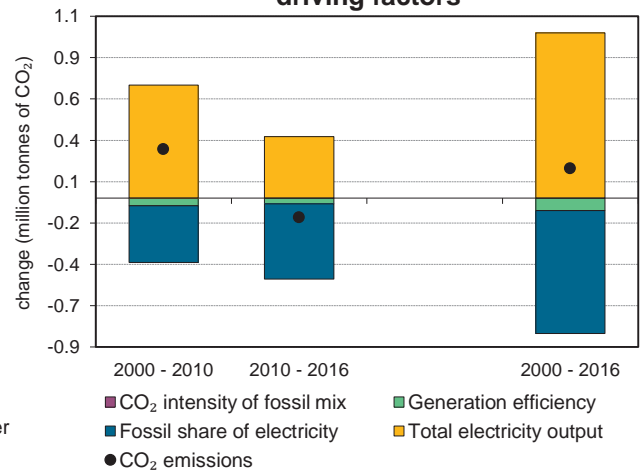


Figure 5. Changes in selected indicators

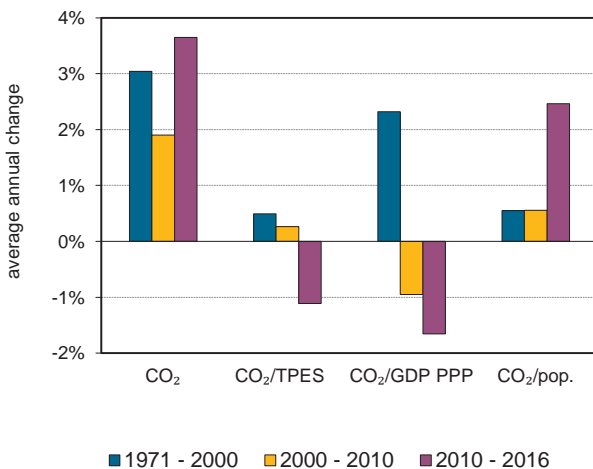
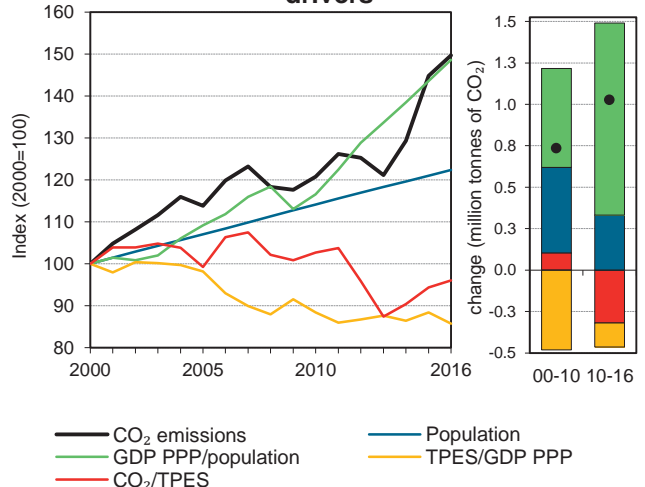


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Nicaragua

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	1.8	2.5	3.5	4.0	4.3	5.1	5.3	188%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	84	95	105	121	124	162	164	94%
GDP (billion 2010 USD)	4.7	5.2	6.6	7.7	8.8	11.4	12.0	154%
GDP PPP (billion 2010 USD)	12.2	13.3	17.0	19.9	22.6	29.6	31.0	154%
Population (millions)	4.2	4.6	5.0	5.4	5.7	6.1	6.2	48%
CO ₂ / TPES (tCO ₂ per TJ)	21.8	26.6	33.6	33.4	34.5	31.7	32.3	48%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.39	0.5	0.5	0.5	0.5	0.4	0.4	14%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.15	0.2	0.2	0.2	0.2	0.2	0.2	13%
CO ₂ / population (tCO ₂ per capita)	0.4	0.5	0.7	0.8	0.7	0.8	0.9	94%
Share of electricity output from fossil fuels	39%	55%	79%	65%	63%	50%	48%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	348	478	597	486	465	358	346	-1%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	137	193	219	233	279	288	188%
Population index	100	111	121	130	138	147	148	48%
GDP PPP per population index	100	98	115	126	134	165	171	71%
Energy intensity index - TPES / GDP PPP	100	102	89	88	79	79	77	-23%
Carbon intensity index - CO ₂ / TPES	100	122	155	153	159	146	148	48%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	5.3	-	-	5.3	188%
Electricity and heat generation	-	1.6	-	-	1.6	212%
Other energy industry own use	-	0.0	-	-	0.0	-32%
Manufacturing industries and construction	-	0.7	-	-	0.7	105%
Transport	-	2.4	-	-	2.4	217%
<i>of which: road</i>	-	2.1	-	-	2.1	200%
Other	-	0.7	-	-	0.7	216%
<i>of which: residential</i>	-	0.2	-	-	0.2	208%
<i>of which: services</i>	-	0.5	-	-	0.5	439%
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.1	-	-	0.1	-15%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	2.1	0.7	11.4	11.4
Main activity prod. elec. and heat - oil	1.5	0.5	8.3	19.6
Manufacturing industries - oil	0.7	0.3	3.6	23.2
Non-specified other - oil	0.5	0.2	2.7	25.9
Other transport - oil	0.2	0.0	1.3	27.2
Residential - oil	0.2	0.0	0.8	28.0
Unallocated autoproducers - oil	0.0	0.0	0.2	28.2
Other energy industry own use - oil	0.0	0.1	0.2	28.4
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	5.3	1.8	28.4	28.4

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Niger ¹

Figure 1. CO₂ emissions by fuel

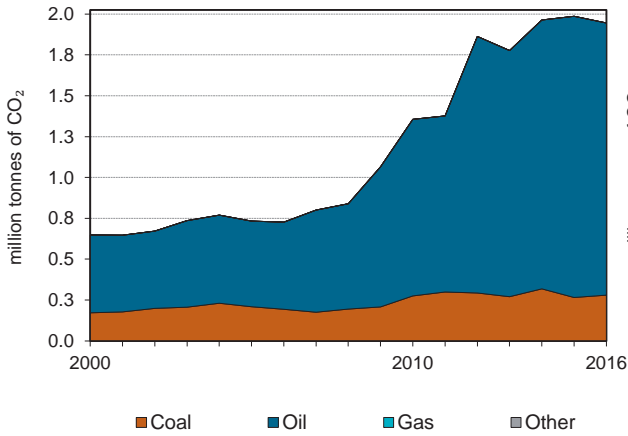


Figure 2. CO₂ emissions by sector

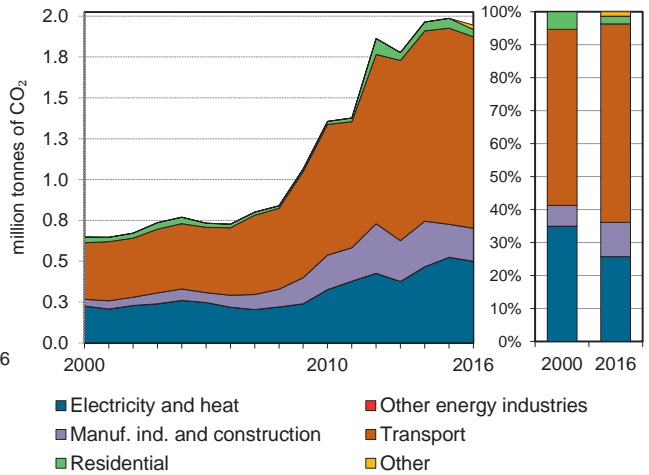


Figure 3. Electricity generation by fuel

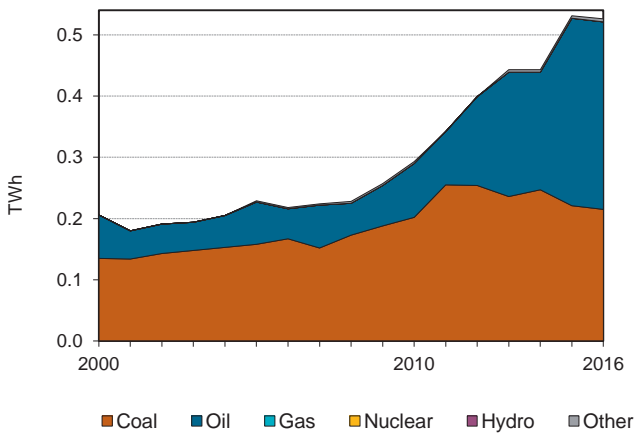


Figure 4. CO₂ from electricity generation: driving factors²

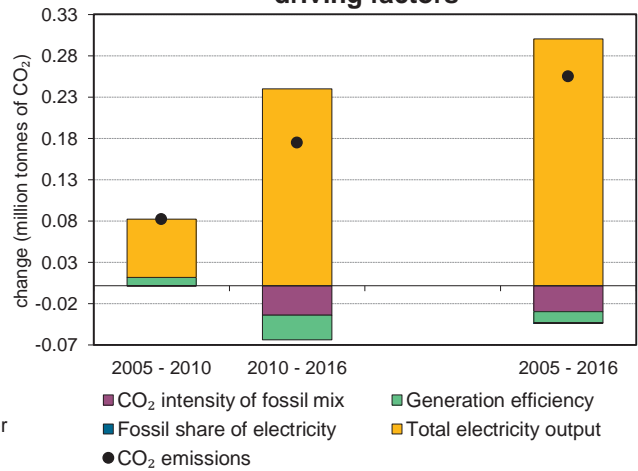


Figure 5. Changes in selected indicators

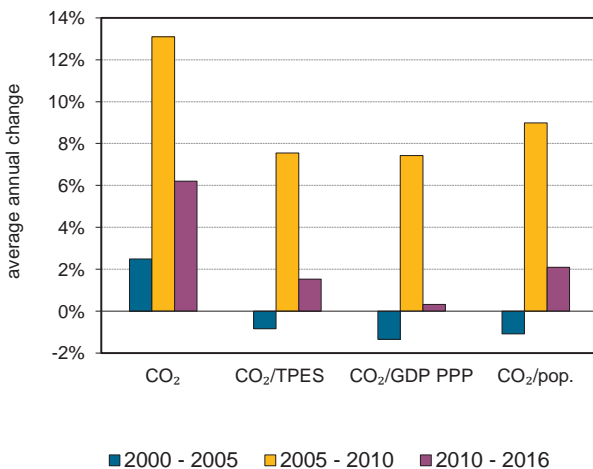
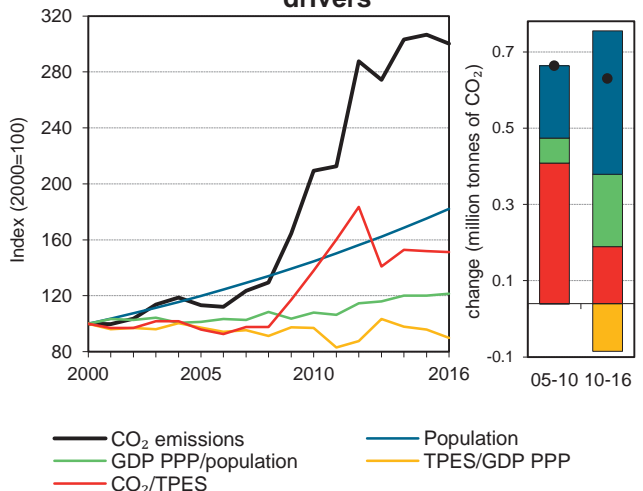


Figure 6. Total CO₂ emissions and drivers³



1. Prior to 2000, data for Niger were included in Other Africa.

2. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.

3. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Niger ¹

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 00-16
CO ₂ fuel combustion (MtCO ₂)	0.6	0.7	1.4	2.0	1.9	200%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	62	73	93	124	122	99%
GDP (billion 2010 USD)	3.7	4.4	5.7	7.6	8.0	119%
GDP PPP (billion 2010 USD)	8.4	10.2	13.1	17.6	18.5	121%
Population (millions)	11.4	13.6	16.4	19.9	20.7	82%
CO ₂ / TPES (tCO ₂ per TJ)	10.5	10.1	14.5	16.0	15.9	51%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.2	0.2	0.2	0.3	0.2	37%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.1	0.1	0.1	0.1	0.1	36%
CO ₂ / population (tCO ₂ per capita)	0.1	0.1	0.1	0.1	0.1	65%
Share of electricity output from fossil fuels	100%	99%	99%	99%	99%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	1099	1081	1115	987	950	-13%
CO₂ emissions and drivers - Kaya decomposition (2000=100) ²								
CO ₂ emissions index	100	113	209	307	300	200%
Population index	100	120	145	175	182	82%
GDP PPP per population index	100	101	108	120	121	21%
Energy intensity index - TPES / GDP PPP	100	97	97	96	90	-10%
Carbon intensity index - CO ₂ / TPES	100	96	138	152	151	51%

1. Prior to 2000, data for Niger were included in Other Africa. 2. Please see Part I for methodological notes.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ³	Total	%change 00-16
CO₂ fuel combustion	0.3	1.7	-	-	1.9	200%
Electricity and heat generation	0.3	0.2	-	-	0.5	121%
Other energy industry own use	-	-	-	-	-	-
Manufacturing industries and construction	-	0.2	-	-	0.2	392%
Transport	-	1.2	-	-	1.2	239%
<i>of which: road</i>	-	1.2	-	-	1.2	239%
Other	-	0.1	-	-	0.1	108%
<i>of which: residential</i>	-	0.0	-	-	0.0	30%
<i>of which: services</i>	-	0.0	-	-	0.0	x
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.1	-	-	0.1	200%

3. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ⁴ (%)	Cumulative total (%)
Road - oil	1.2	0.3	..	..
Main activity prod. elec. and heat - coal	0.3	0.2	..	..
Manufacturing industries - oil	0.2	0.0	..	..
Main activity prod. elec. and heat - oil	0.1	0.1	..	..
Unallocated autoproducers - oil	0.1	0.0	..	..
Residential - oil	0.0	0.0	..	..
Non-specified other - oil	0.0	-	..	..
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	<i>1.9</i>	<i>..</i>	<i>..</i>	<i>..</i>

4. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Nigeria

Figure 1. CO₂ emissions by fuel

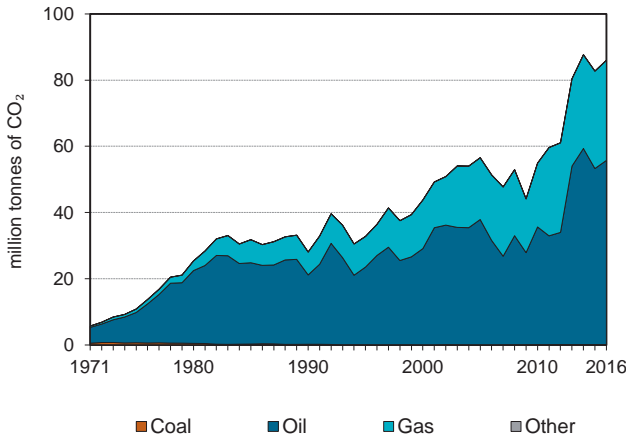


Figure 2. CO₂ emissions by sector

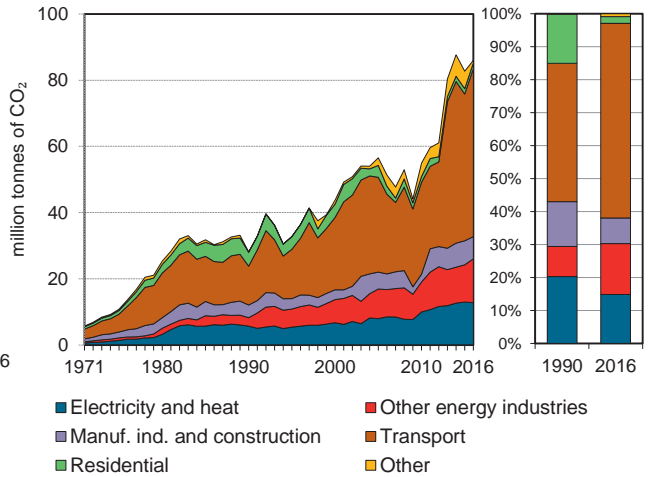


Figure 3. Electricity generation by fuel

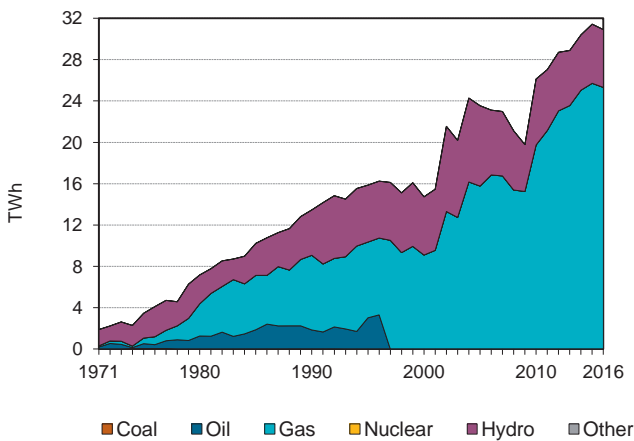


Figure 4. CO₂ from electricity generation: driving factors¹

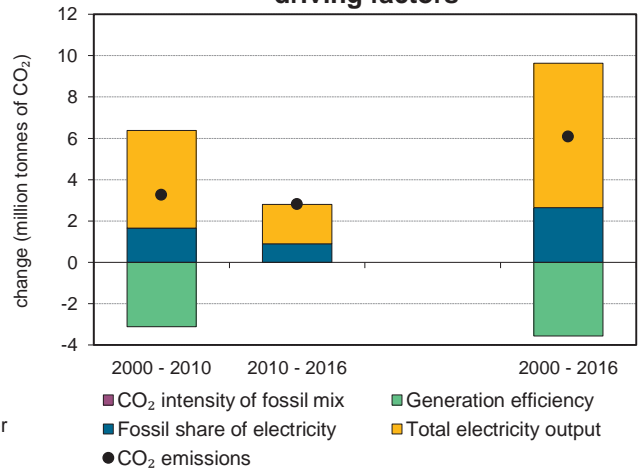


Figure 5. Changes in selected indicators

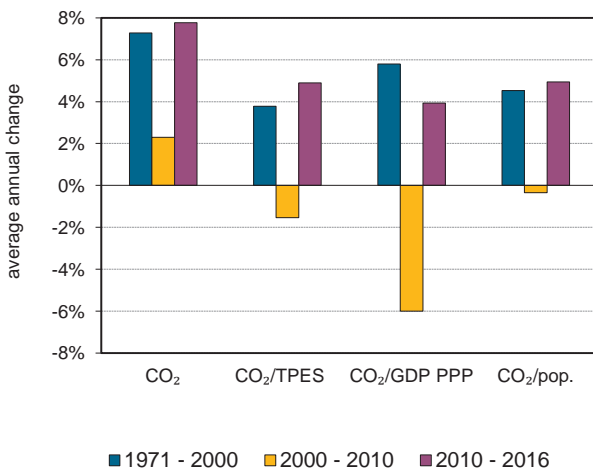
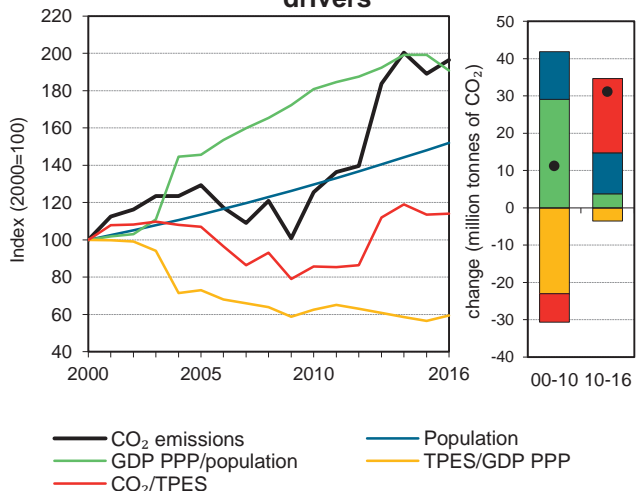


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Nigeria

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	28.1	32.8	43.8	56.6	54.9	82.7	86.0	206%
Share of World CO ₂ from fuel combustion	0.1%	0.2%	0.2%	0.2%	0.2%	0.3%	0.3%	
TPES (PJ)	2781	3 055	3 645	4 406	5 342	6 071	6 279	126%
GDP (billion 2010 USD)	130.9	134.2	157.5	260.5	369.1	464.3	457.1	249%
GDP PPP (billion 2010 USD)	283.9	291.0	341.4	564.8	800.2	1 006.6	990.4	249%
Population (millions)	95.3	108.0	122.4	138.9	158.6	181.2	186.0	95%
CO ₂ / TPES (tCO ₂ per TJ)	10.1	10.7	12.0	12.8	10.3	13.6	13.7	36%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.21	0.2	0.3	0.2	0.1	0.2	0.2	-12%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-12%
CO ₂ / population (tCO ₂ per capita)	0.3	0.3	0.4	0.4	0.3	0.5	0.5	57%
Share of electricity output from fossil fuels	67%	65%	62%	67%	76%	82%	82%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	423	339	456	338	382	413	414	-2%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	117	156	202	196	295	306	206%
Population index	100	113	128	146	166	190	195	95%
GDP PPP per population index	100	90	94	136	169	186	179	79%
Energy intensity index - TPES / GDP PPP	100	107	109	80	68	62	65	-35%
Carbon intensity index - CO ₂ / TPES	100	106	119	127	102	135	136	36%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.1	55.6	30.3	-	86.0	206%
Electricity and heat generation	-	-	12.8	-	12.8	124%
Other energy industry own use	-	1.0	12.3	-	13.3	421%
Manufacturing industries and construction	0.1	1.4	5.2	-	6.7	75%
Transport	-	50.8	-	-	50.8	332%
<i>of which: road</i>	-	50.4	-	-	50.4	337%
Other	-	2.5	-	-	2.5	-41%
<i>of which: residential</i>	-	1.7	-	-	1.7	-59%
<i>of which: services</i>	-	0.0	-	-	0.0	-65%
<i>Memo: international marine bunkers</i>	-	1.0	-	-	1.0	68%
<i>Memo: international aviation bunkers</i>	-	1.4	-	-	1.4	40%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	50.4	11.5	15.6	15.6
Other energy industry own use - gas	12.3	1.0	3.8	19.4
Main activity prod. elec. and heat - gas	10.0	4.2	3.1	22.4
Manufacturing industries - gas	5.2	1.7	1.6	24.1
Unallocated autoproducers - gas	2.8	-	0.9	24.9
Residential - oil	1.7	4.2	0.5	25.5
Manufacturing industries - oil	1.4	2.0	0.4	25.9
Other energy industry own use - oil	1.0	1.6	0.3	26.2
Non-specified other - oil	0.8	0.0	0.2	26.4
<i>Memo: total CO₂ from fuel combustion</i>	<i>86.0</i>	<i>28.1</i>	<i>26.6</i>	<i>26.6</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Norway

Figure 1. CO₂ emissions by fuel

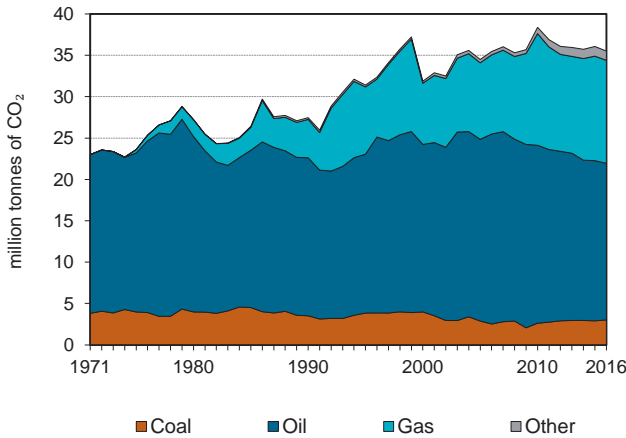


Figure 2. CO₂ emissions by sector

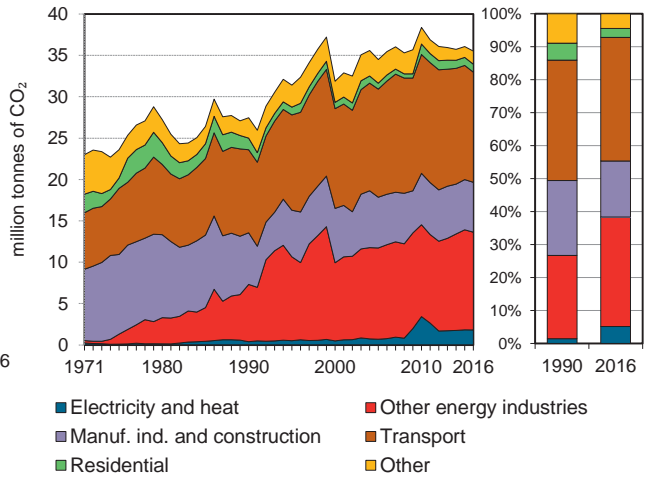


Figure 3. Electricity generation by fuel

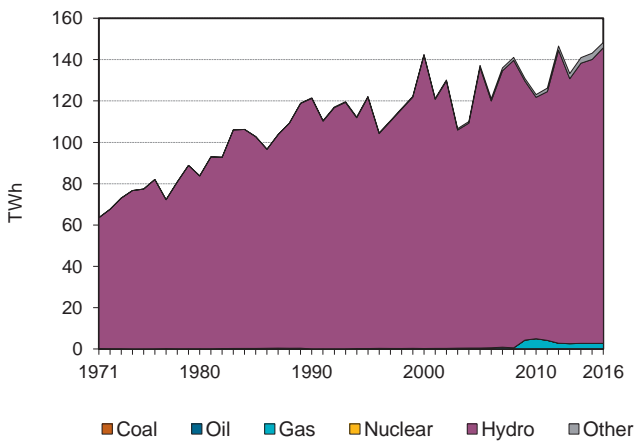


Figure 4. CO₂ from electricity generation: driving factors¹

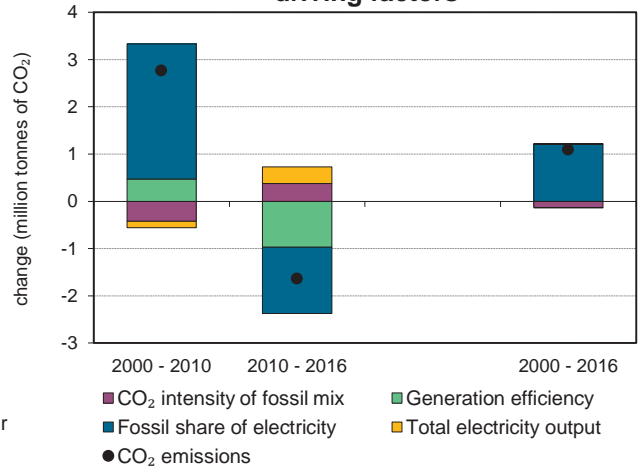


Figure 5. Changes in selected indicators

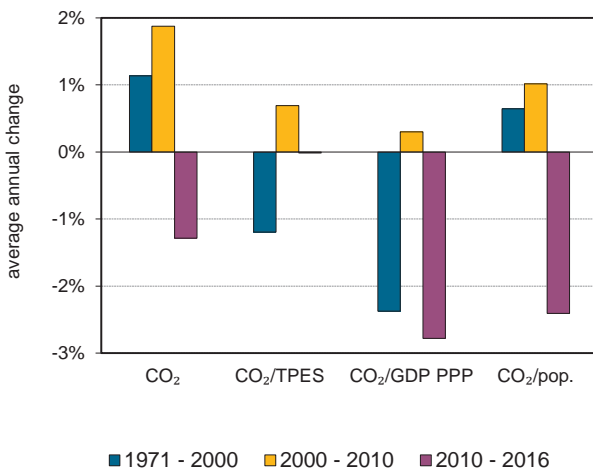
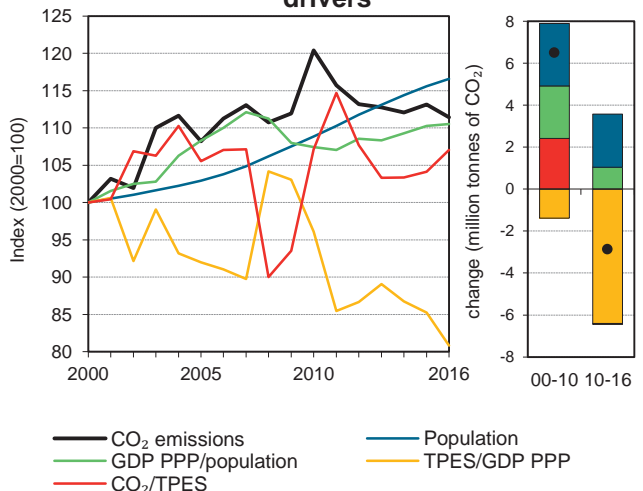


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Norway

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	27.5	31.4	31.9	34.5	38.4	36.1	35.5	29%
Share of World CO ₂ from fuel combustion	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	
TPES (PJ)	882	984	1 095	1 123	1 231	1 190	1 140	29%
GDP (billion 2010 USD)	255.6	307.1	367.0	409.1	429.1	467.7	472.8	85%
GDP PPP (billion 2010 USD)	169.2	203.2	242.8	270.7	284.0	309.5	312.8	85%
Population (millions)	4.2	4.4	4.5	4.6	4.9	5.2	5.2	23%
CO ₂ / TPES (tCO ₂ per TJ)	31.1	31.9	29.1	30.7	31.2	30.3	31.1	0%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.11	0.1	0.1	0.1	0.1	0.1	0.1	-30%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.16	0.2	0.1	0.1	0.1	0.1	0.1	-30%
CO ₂ / population (tCO ₂ per capita)	6.5	7.2	7.1	7.5	7.9	6.9	6.8	5%
Share of electricity output from fossil fuels	0%	0%	0%	0%	4%	2%	2%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	1	1	1	2	23	9	8	538%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	114	116	126	140	131	129	29%
Population index	100	103	106	109	115	122	123	23%
GDP PPP per population index	100	117	136	147	146	149	150	50%
Energy intensity index - TPES / GDP PPP	100	93	87	80	83	74	70	-30%
Carbon intensity index - CO ₂ / TPES	100	102	93	99	100	97	100	0%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	3.0	18.9	12.4	1.1	35.5	29%
Electricity and heat generation	0.3	0.1	0.8	0.6	1.8	361%
Other energy industry own use	-	1.1	10.7	-	11.8	71%
Manufacturing industries and construction	2.7	2.3	0.6	0.5	6.0	-3%
Transport	-	13.0	0.3	-	13.3	33%
<i>of which: road</i>	-	9.3	0.1	-	9.3	22%
Other	-	2.4	0.1	0.0	2.5	-34%
<i>of which: residential</i>	-	1.0	0.0	-	1.0	-31%
<i>of which: services</i>	-	0.7	0.1	0.0	0.8	-22%
<i>Memo: international marine bunkers</i>	-	0.2	0.1	-	0.3	-81%
<i>Memo: international aviation bunkers</i>	-	1.5	-	-	1.5	23%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Other energy industry own use - gas	10.7	4.6	20.0	20.0
Road - oil	9.3	7.7	17.4	37.5
Other transport - oil	3.8	2.4	7.0	44.5
Manufacturing industries - coal	2.7	3.3	5.0	49.5
Manufacturing industries - oil	2.3	2.9	4.3	53.8
Non-specified other - oil	1.5	2.5	2.7	56.6
Other energy industry own use - oil	1.1	2.3	2.1	58.7
Residential - oil	1.0	1.4	1.8	60.5
Unallocated autoproducers - gas	0.8	-	1.4	61.9
<i>Memo: total CO₂ from fuel combustion</i>	<i>35.5</i>	<i>27.5</i>	<i>66.6</i>	<i>66.6</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Oman

Figure 1. CO₂ emissions by fuel

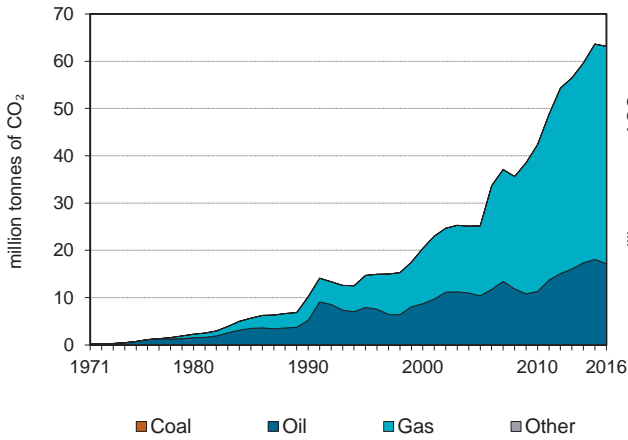


Figure 2. CO₂ emissions by sector

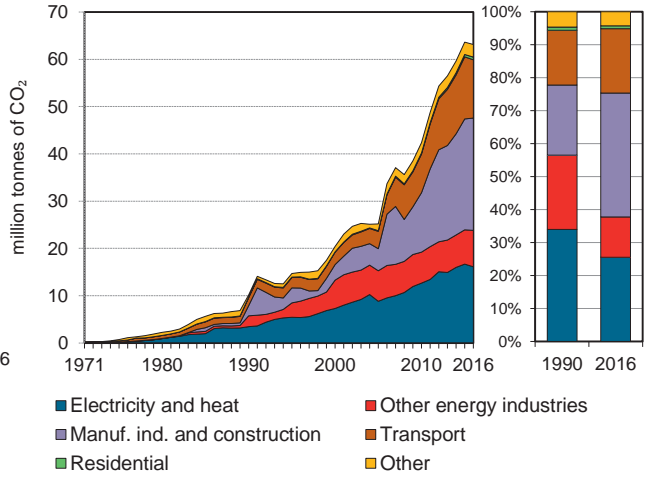


Figure 3. Electricity generation by fuel

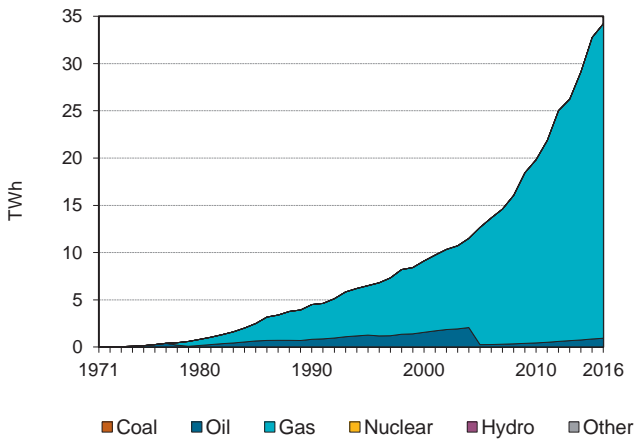


Figure 4. CO₂ from electricity generation: driving factors¹

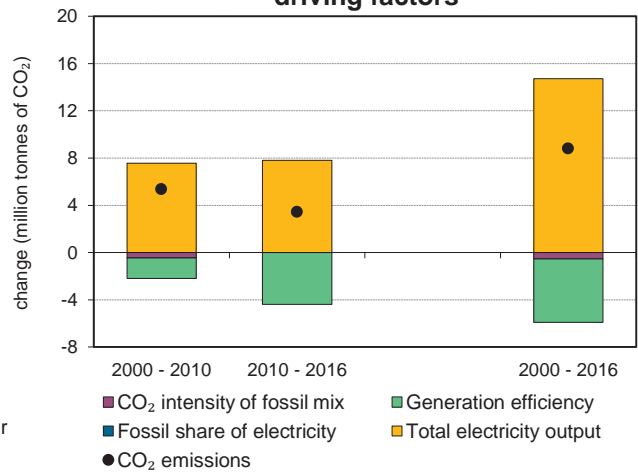


Figure 5. Changes in selected indicators

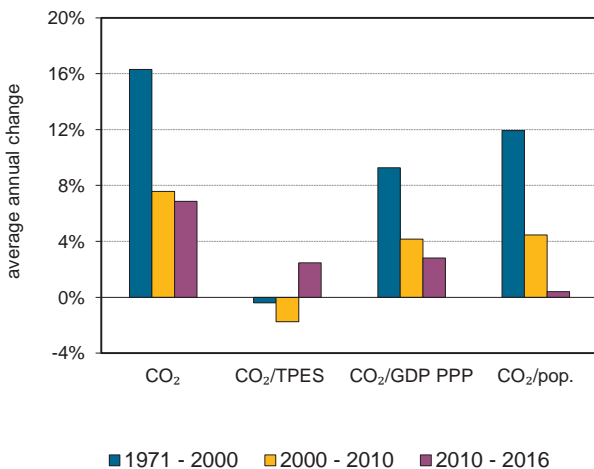
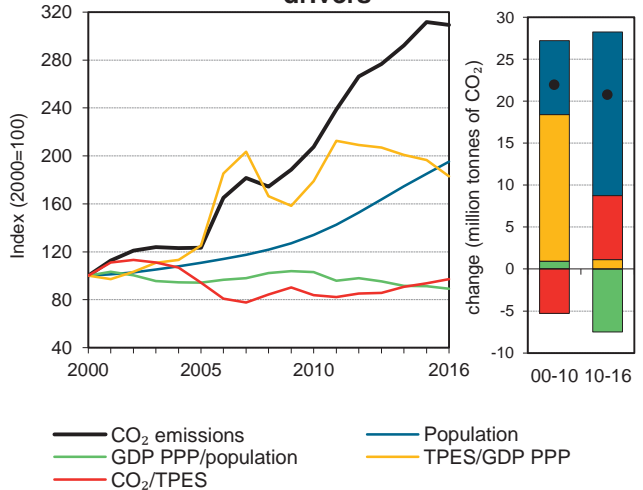


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Oman

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	10.2	14.7	20.4	25.2	42.4	63.6	63.1	521%
Share of World CO ₂ from fuel combustion	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%	
TPES (PJ)	177	255	317	415	784	1 053	1 009	471%
GDP (billion 2010 USD)	27	35.9	42.4	44.3	58.6	71.7	73.9	174%
GDP PPP (billion 2010 USD)	62.2	82.8	97.7	102.0	135.1	165.2	170.2	174%
Population (millions)	1.8	2.2	2.3	2.5	3.0	4.2	4.4	144%
CO ₂ / TPES (tCO ₂ per TJ)	57.5	57.5	64.4	60.7	54.0	60.5	62.5	9%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.38	0.4	0.5	0.6	0.7	0.9	0.9	127%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.16	0.2	0.2	0.2	0.3	0.4	0.4	128%
CO ₂ / population (tCO ₂ per capita)	5.6	6.7	9.0	10.0	13.9	15.2	14.3	154%
Share of electricity output from fossil fuels	100%	100%	100%	100%	100%	100%	100%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	767	836	801	696	639	509	471	-39%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	145	201	248	417	626	621	521%
Population index	100	122	125	139	168	232	244	144%
GDP PPP per population index	100	109	125	118	129	115	112	12%
Energy intensity index - TPES / GDP PPP	100	109	114	143	204	224	209	109%
Carbon intensity index - CO ₂ / TPES	100	100	112	106	94	105	109	9%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	17.2	46.0	-	63.1	521%
Electricity and heat generation	-	0.7	15.4	-	16.1	367%
Other energy industry own use	-	0.3	7.4	-	7.7	237%
Manufacturing industries and construction	-	1.0	22.8	-	23.8	1000%
Transport	-	12.3	-	-	12.3	633%
<i>of which: road</i>	-	12.3	-	-	12.3	633%
Other	-	2.9	0.4	-	3.2	461%
<i>of which: residential</i>	-	0.6	-	-	0.6	437%
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	5.2	-	-	5.2	+
<i>Memo: international aviation bunkers</i>	-	1.6	-	-	1.6	74%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Manufacturing industries - gas	22.8	0.6	22.2	22.2
Main activity prod. elec. and heat - gas	15.4	2.6	15.0	37.3
Road - oil	12.3	1.7	12.0	49.3
Other energy industry own use - gas	7.4	1.6	7.3	56.6
Non-specified other - oil	2.3	0.3	2.3	58.8
Manufacturing industries - oil	1.0	1.6	1.0	59.8
Main activity prod. elec. and heat - oil	0.7	0.9	0.7	60.5
Residential - oil	0.6	0.1	0.5	61.1
Non-specified other - gas	0.4	0.2	0.4	61.4
<i>Memo: total CO₂ from fuel combustion</i>	63.1	10.2	61.7	61.7

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Pakistan

Figure 1. CO₂ emissions by fuel

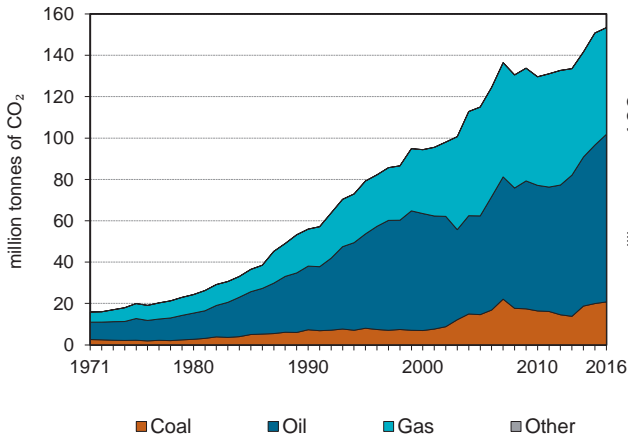


Figure 2. CO₂ emissions by sector

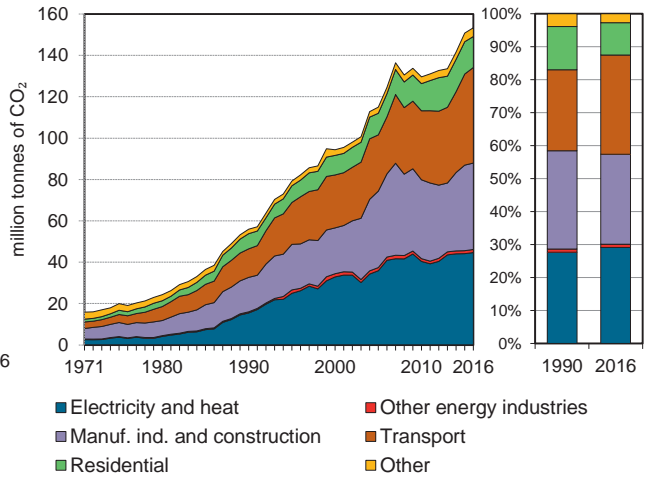


Figure 3. Electricity generation by fuel

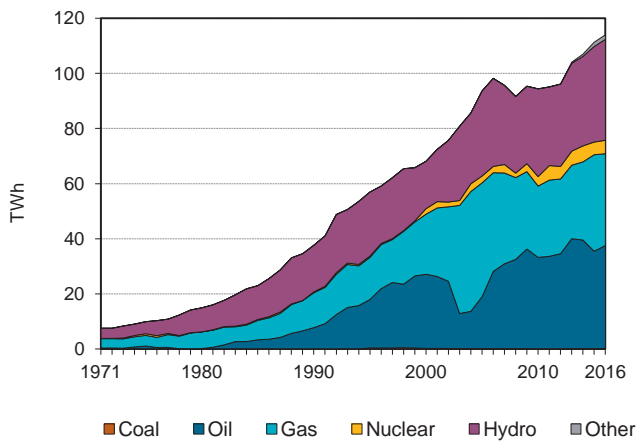


Figure 4. CO₂ from electricity generation: driving factors¹

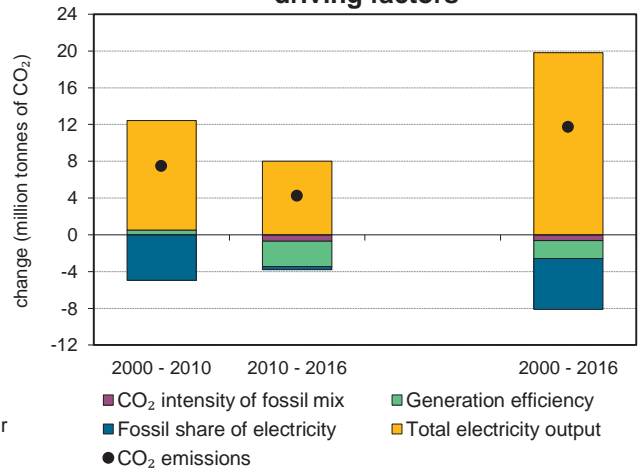


Figure 5. Changes in selected indicators

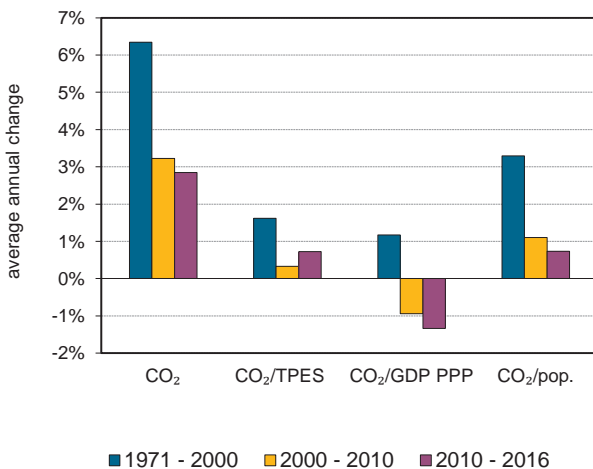
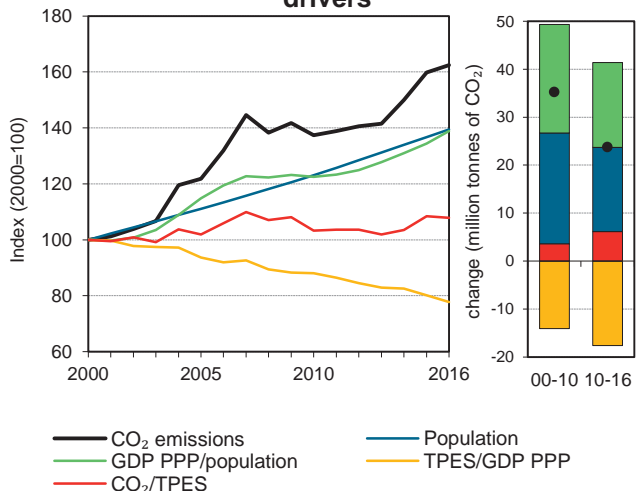


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Pakistan

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	56	79.2	94.4	115.0	129.6	150.8	153.4	174%
Share of World CO ₂ from fuel combustion	0.3%	0.4%	0.4%	0.4%	0.4%	0.5%	0.5%	
TPES (PJ)	1796	2 242	2 660	3 180	3 536	3 918	4 007	123%
GDP (billion 2010 USD)	79.9	100.1	117.6	150.0	177.4	215.9	228.3	186%
GDP PPP (billion 2010 USD)	322.3	404.1	474.3	605.2	715.8	871.3	919.0	185%
Population (millions)	107.7	122.8	138.5	153.9	170.6	189.4	193.2	79%
CO ₂ / TPES (tCO ₂ per TJ)	31.2	35.4	35.5	36.2	36.7	38.5	38.3	23%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.7	0.8	0.8	0.8	0.7	0.7	0.7	-4%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.17	0.2	0.2	0.2	0.2	0.2	0.2	-4%
CO ₂ / population (tCO ₂ per capita)	0.5	0.6	0.7	0.7	0.8	0.8	0.8	53%
Share of electricity output from fossil fuels	54%	58%	72%	64%	63%	63%	62%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	411	439	483	383	428	397	392	-5%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	142	169	205	232	269	274	174%
Population index	100	114	129	143	158	176	179	79%
GDP PPP per population index	100	110	114	131	140	154	159	59%
Energy intensity index - TPES / GDP PPP	100	100	101	94	89	81	78	-22%
Carbon intensity index - CO ₂ / TPES	100	113	114	116	118	124	123	23%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	20.8	81.0	51.6	-	153.4	174%
Electricity and heat generation	0.5	25.9	18.2	-	44.7	189%
Other energy industry own use	-	1.2	0.3	-	1.5	180%
Manufacturing industries and construction	20.3	6.8	14.7	-	41.8	151%
Transport	-	43.0	3.2	-	46.2	235%
<i>of which: road</i>	-	41.7	3.2	-	44.9	249%
Other	-	4.1	15.2	-	19.2	102%
<i>of which: residential</i>	-	1.5	13.5	-	15.0	104%
<i>of which: services</i>	-	2.0	1.7	-	3.7	201%
<i>Memo: international marine bunkers</i>	-	0.2	-	-	0.2	59%
<i>Memo: international aviation bunkers</i>	-	2.4	-	-	2.4	68%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	41.7	12.9	9.8	9.8
Main activity prod. elec. and heat - oil	25.9	7.0	6.1	16.0
Manufacturing industries - coal	20.3	7.2	4.8	20.7
Main activity prod. elec. and heat - gas	18.2	8.4	4.3	25.0
Manufacturing industries - gas	14.7	5.3	3.5	28.5
Residential - gas	13.5	3.5	3.2	31.7
Manufacturing industries - oil	6.8	4.1	1.6	33.3
Road - gas	3.2	0.0	0.8	34.0
Non-specified other - oil	2.6	1.5	0.6	34.7
<i>Memo: total CO₂ from fuel combustion</i>	<i>153.4</i>	<i>56</i>	<i>36.2</i>	<i>36.2</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Panama

Figure 1. CO₂ emissions by fuel

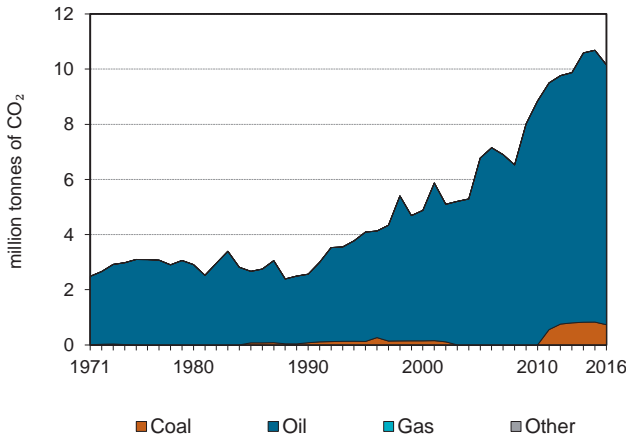


Figure 2. CO₂ emissions by sector

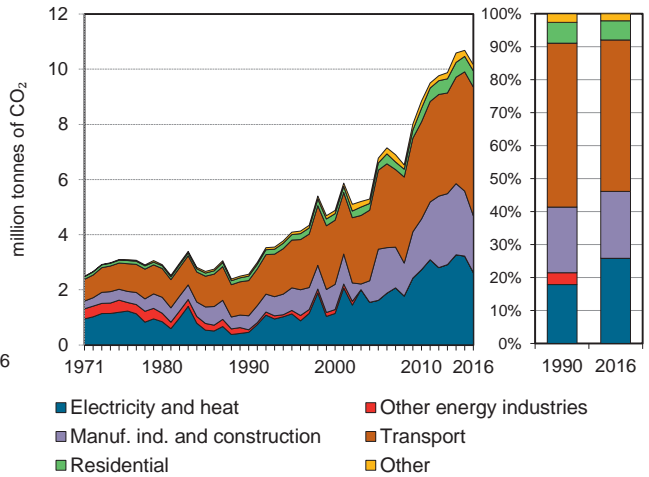


Figure 3. Electricity generation by fuel

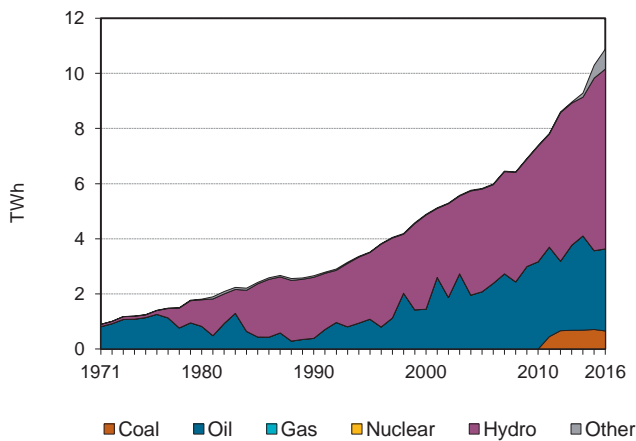


Figure 4. CO₂ from electricity generation: driving factors¹

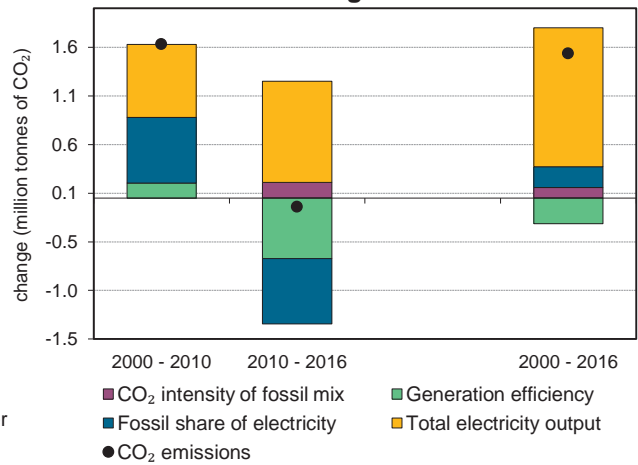


Figure 5. Changes in selected indicators

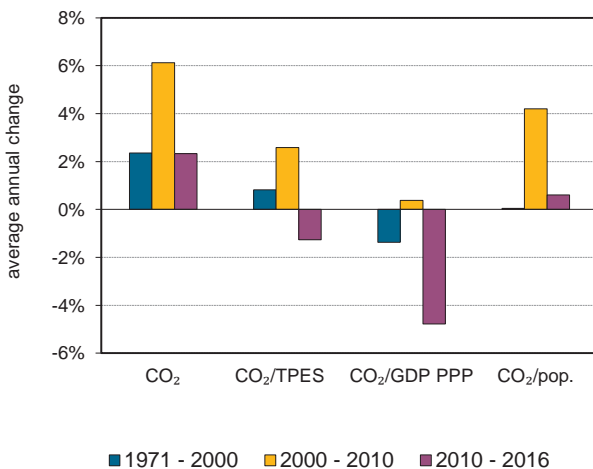
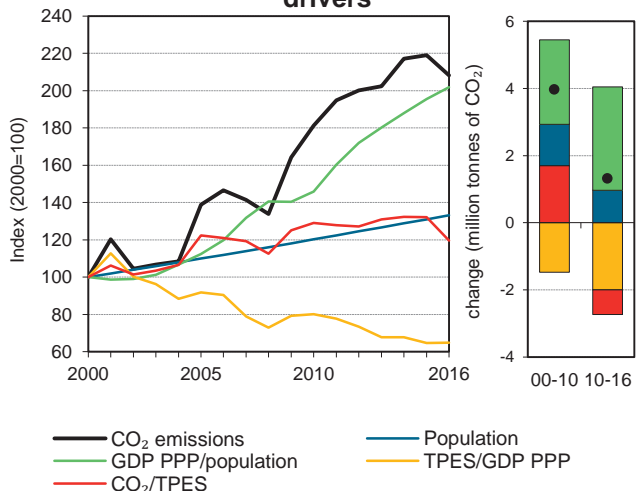


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Panama

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	2.6	4.1	4.9	6.8	8.8	10.7	10.2	296%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	62	84	108	122	151	178	187	200%
GDP (billion 2010 USD)	9.9	13.0	16.5	20.4	28.9	42.2	44.3	346%
GDP PPP (billion 2010 USD)	18.9	24.7	31.4	38.8	55.0	80.4	84.3	346%
Population (millions)	2.5	2.7	3.0	3.3	3.6	4.0	4.0	63%
CO ₂ / TPES (tCO ₂ per TJ)	41.1	48.9	45.3	55.5	58.5	59.9	54.2	32%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.26	0.3	0.3	0.3	0.3	0.3	0.2	-11%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.14	0.2	0.2	0.2	0.2	0.1	0.1	-11%
CO ₂ / population (tCO ₂ per capita)	1	1.5	1.6	2.0	2.4	2.7	2.5	143%
Share of electricity output from fossil fuels	15%	31%	30%	36%	43%	35%	33%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	172	320	234	278	370	313	241	40%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	160	190	264	345	417	396	296%
Population index	100	111	123	135	147	161	163	63%
GDP PPP per population index	100	118	135	152	197	265	273	173%
Energy intensity index - TPES / GDP PPP	100	103	104	95	83	67	67	-33%
Carbon intensity index - CO ₂ / TPES	100	119	110	135	143	146	132	32%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.7	9.4	-	-	10.2	296%
Electricity and heat generation	0.7	1.9	-	-	2.6	473%
Other energy industry own use	-	-	-	-	-	-100%
Manufacturing industries and construction	-	2.1	-	-	2.1	304%
Transport	-	4.7	-	-	4.7	266%
<i>of which: road</i>	-	4.7	-	-	4.7	266%
Other	-	0.8	-	-	0.8	251%
<i>of which: residential</i>	-	0.6	-	-	0.6	263%
<i>of which: services</i>	-	0.2	-	-	0.2	140%
<i>Memo: international marine bunkers</i>	-	12.5	-	-	12.5	153%
<i>Memo: international aviation bunkers</i>	-	2.2	-	-	2.2	958%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	4.7	1.3	29.5	29.5
Manufacturing industries - oil	2.1	0.4	13.1	42.6
Main activity prod. elec. and heat - oil	1.9	0.4	12.0	54.6
Main activity prod. elec. and heat - coal	0.7	-	4.6	59.2
Residential - oil	0.6	0.2	3.7	62.9
Non-specified other - oil	0.2	0.1	1.4	64.3
Other transport - oil	0.0	-	0.0	64.3
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	<i>10.2</i>	<i>2.6</i>	<i>64.3</i>	<i>64.3</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Paraguay

Figure 1. CO₂ emissions by fuel

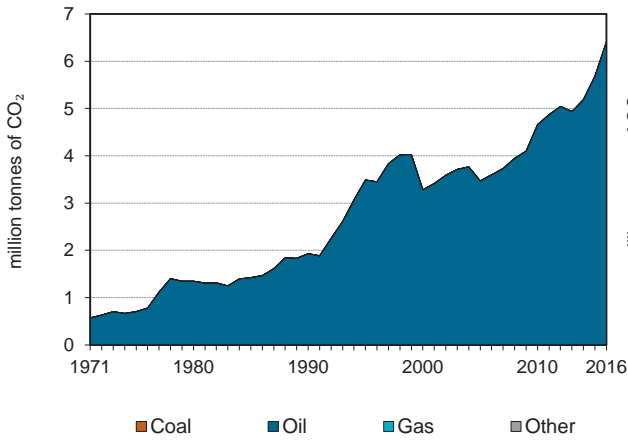


Figure 2. CO₂ emissions by sector

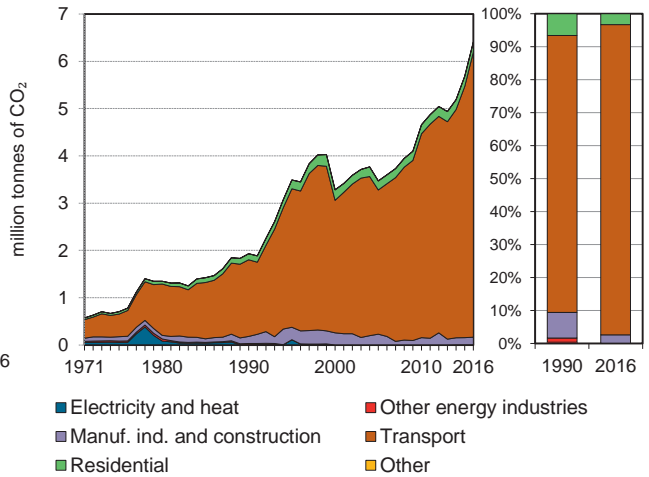


Figure 3. Electricity generation by fuel

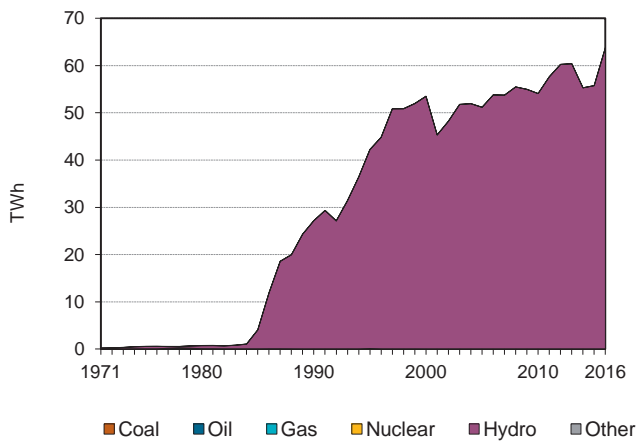


Figure 4. CO₂ from electricity generation: driving factors¹

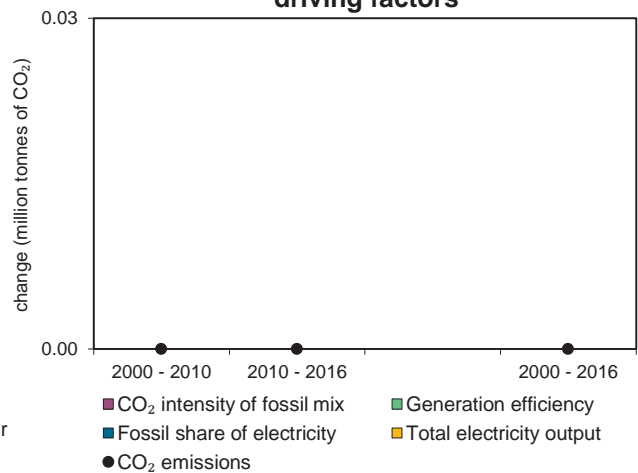


Figure 5. Changes in selected indicators

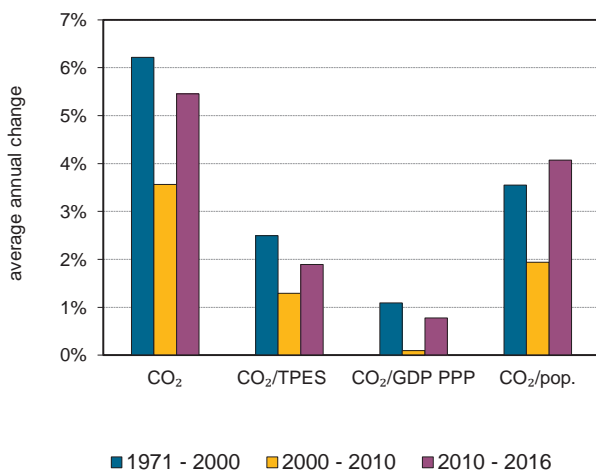
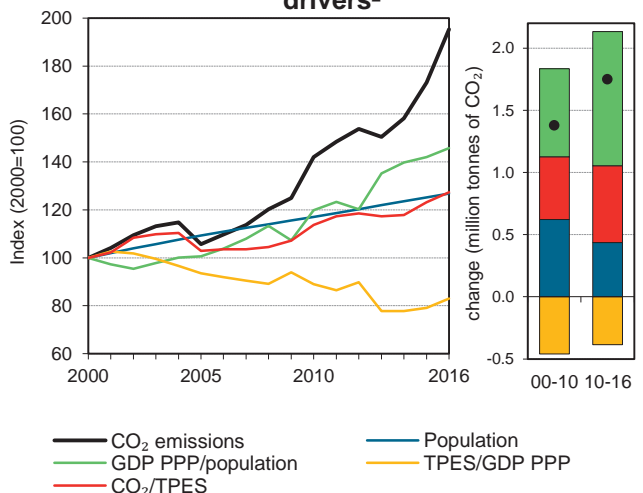


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Paraguay

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	1.9	3.5	3.3	3.5	4.7	5.7	6.4	232%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	129	164	161	166	201	227	247	92%
GDP (billion 2010 USD)	11.3	14.0	14.3	15.7	20.0	25.4	26.4	135%
GDP PPP (billion 2010 USD)	24.9	31.0	31.6	34.8	44.4	56.2	58.5	135%
Population (millions)	4.2	4.8	5.3	5.8	6.2	6.6	6.7	60%
CO ₂ / TPES (tCO ₂ per TJ)	15	21.2	20.4	20.9	23.1	25.1	25.9	73%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.17	0.3	0.2	0.2	0.2	0.2	0.2	42%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.08	0.1	0.1	0.1	0.1	0.1	0.1	43%
CO ₂ / population (tCO ₂ per capita)	0.5	0.7	0.6	0.6	0.8	0.9	1.0	108%
Share of electricity output from fossil fuels	0%	0%	0%	0%	0%	0%	0%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	0	3	-	-	-	0	0	-79%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	181	170	180	241	294	332	232%
Population index	100	113	126	138	147	158	160	60%
GDP PPP per population index	100	110	101	101	121	143	147	47%
Energy intensity index - TPES / GDP PPP	100	103	99	92	88	78	82	-18%
Carbon intensity index - CO ₂ / TPES	100	142	136	140	154	167	173	73%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	6.4	-	-	6.4	232%
Electricity and heat generation	-	0.0	-	-	0.0	-50%
Other energy industry own use	-	-	-	-	-	-100%
Manufacturing industries and construction	-	0.2	-	-	0.2	8%
Transport	-	6.0	-	-	6.0	272%
<i>of which: road</i>	-	6.0	-	-	6.0	280%
Other	-	0.2	-	-	0.2	66%
<i>of which: residential</i>	-	0.2	-	-	0.2	66%
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.1	-	-	0.1	320%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	6.0	1.6	14.3	14.3
Residential - oil	0.2	0.1	0.5	14.8
Manufacturing industries - oil	0.2	0.1	0.4	15.1
Other transport - oil	0.0	0.0	0.1	15.2
Unallocated autoproducers - oil	0.0	0.0	0.0	15.2
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	6.4	1.9	15.2	15.2

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Peru

Figure 1. CO₂ emissions by fuel

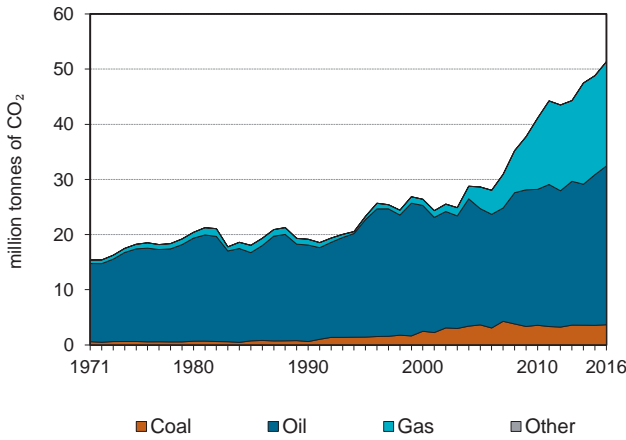


Figure 2. CO₂ emissions by sector

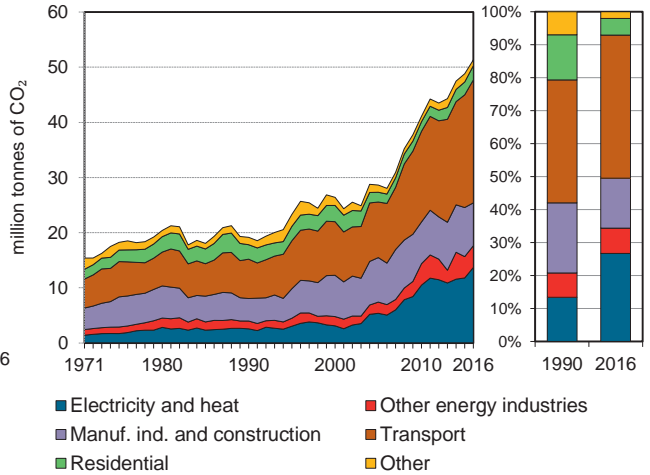


Figure 3. Electricity generation by fuel

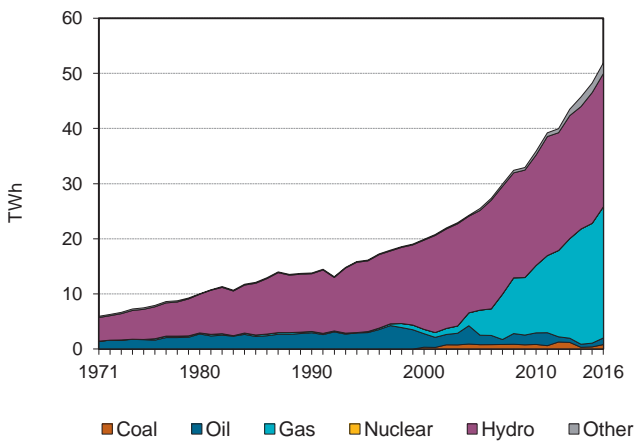


Figure 4. CO₂ from electricity generation: driving factors¹

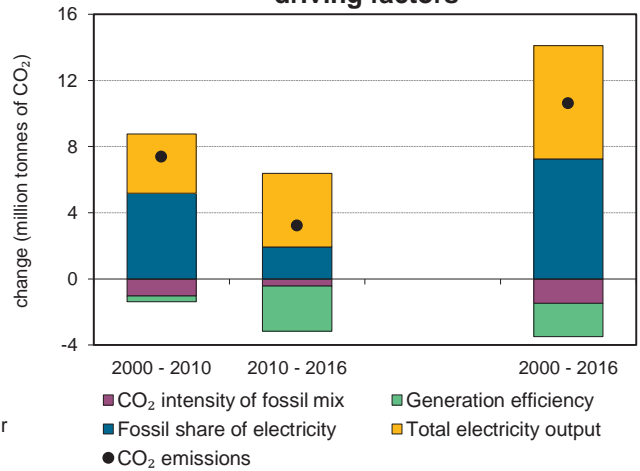


Figure 5. Changes in selected indicators

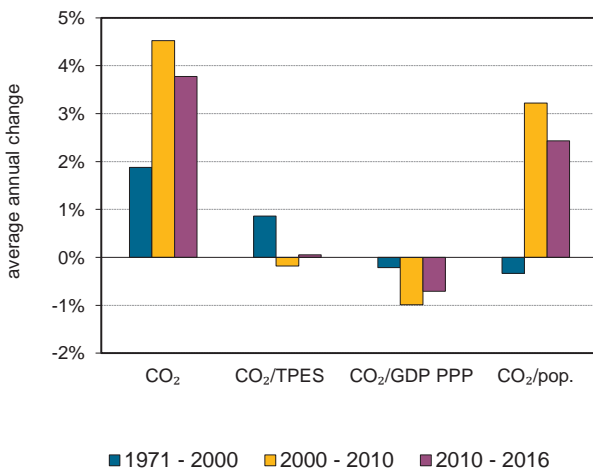
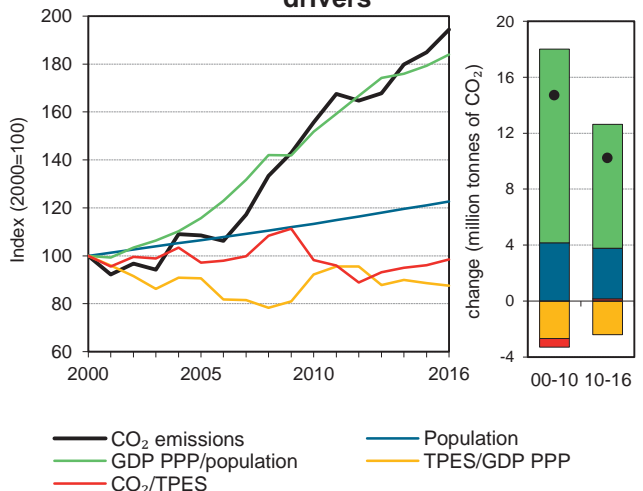


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Peru

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	19.2	23.3	26.4	28.6	41.1	48.8	51.3	168%
Share of World CO ₂ from fuel combustion	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%	
TPES (PJ)	408	459	512	571	811	984	1 010	148%
GDP (billion 2010 USD)	58.5	75.5	85.8	105.8	147.5	186.3	193.5	231%
GDP PPP (billion 2010 USD)	113.6	146.6	166.6	205.5	286.5	361.8	375.8	231%
Population (millions)	21.8	24.0	25.9	27.6	29.4	31.4	31.8	46%
CO ₂ / TPES (tCO ₂ per TJ)	47	50.7	51.6	50.1	50.7	49.6	50.8	8%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.33	0.3	0.3	0.3	0.3	0.3	0.3	-19%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.17	0.2	0.2	0.1	0.1	0.1	0.1	-19%
CO ₂ / population (tCO ₂ per capita)	0.9	1.0	1.0	1.0	1.4	1.6	1.6	84%
Share of electricity output from fossil fuels	23%	20%	18%	28%	42%	47%	50%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	186	188	156	211	292	244	264	42%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	122	138	150	215	255	268	168%
Population index	100	110	119	126	135	144	146	46%
GDP PPP per population index	100	117	124	143	187	222	227	127%
Energy intensity index - TPES / GDP PPP	100	87	86	78	79	76	75	-25%
Carbon intensity index - CO ₂ / TPES	100	108	110	107	108	106	108	8%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	3.7	28.8	18.9	-	51.3	168%
Electricity and heat generation	1.2	1.3	11.2	-	13.7	435%
Other energy industry own use	-	0.7	3.2	-	3.9	178%
Manufacturing industries and construction	2.5	2.6	2.7	-	7.8	91%
Transport	-	20.8	1.5	-	22.3	212%
<i>of which: road</i>	-	20.6	1.5	-	22.1	222%
Other	-	3.4	0.3	-	3.6	-8%
<i>of which: residential</i>	-	2.4	0.2	-	2.6	-1%
<i>of which: services</i>	-	0.7	0.1	-	0.7	11%
<i>Memo: international marine bunkers</i>	-	0.5	-	-	0.5	441%
<i>Memo: international aviation bunkers</i>	-	2.9	-	-	2.9	346%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	20.6	6.9	22.7	22.7
Main activity prod. elec. and heat - gas	10.6	-	11.7	34.4
Other energy industry own use - gas	3.2	0.7	3.6	38.0
Manufacturing industries - gas	2.7	0.1	3.0	40.9
Manufacturing industries - oil	2.6	3.4	2.9	43.8
Manufacturing industries - coal	2.5	0.6	2.7	46.5
Residential - oil	2.4	2.5	2.7	49.2
Road - gas	1.5	-	1.7	50.9
Non-specified other - oil	1.0	1.3	1.1	51.9
<i>Memo: total CO₂ from fuel combustion</i>	<i>51.3</i>	<i>19.2</i>	<i>56.6</i>	<i>56.6</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Philippines

Figure 1. CO₂ emissions by fuel

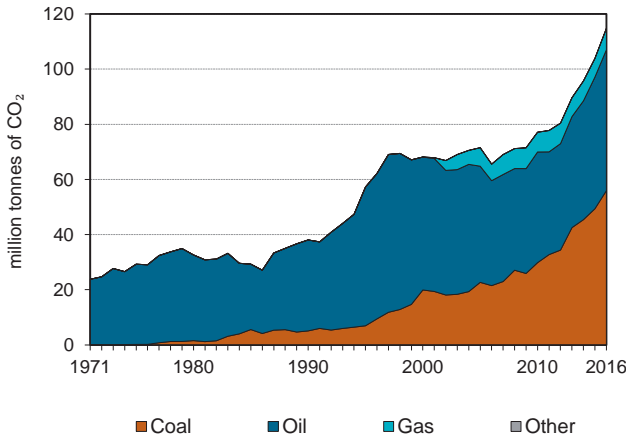


Figure 2. CO₂ emissions by sector

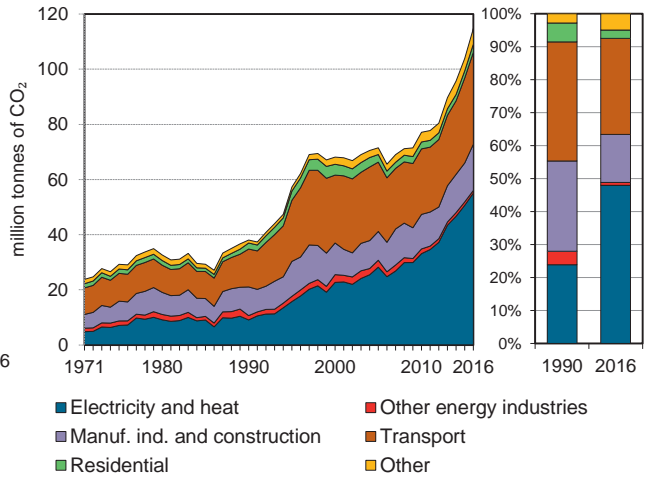


Figure 3. Electricity generation by fuel

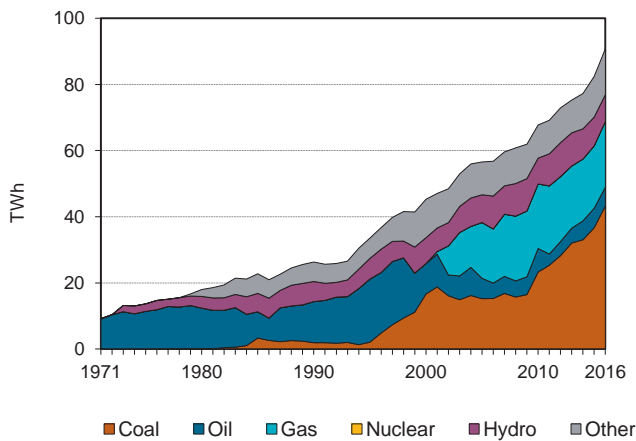


Figure 4. CO₂ from electricity generation: driving factors¹

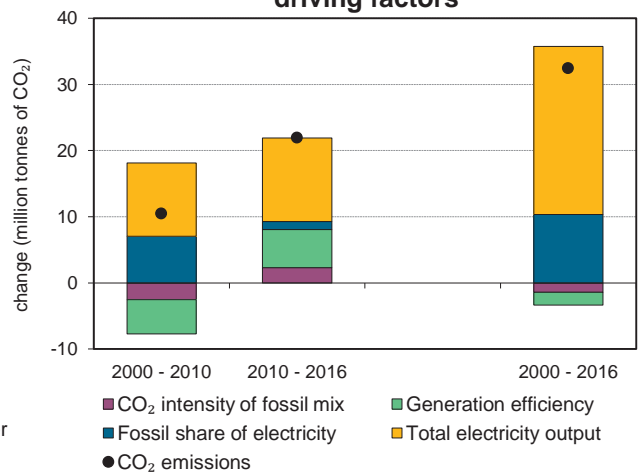


Figure 5. Changes in selected indicators

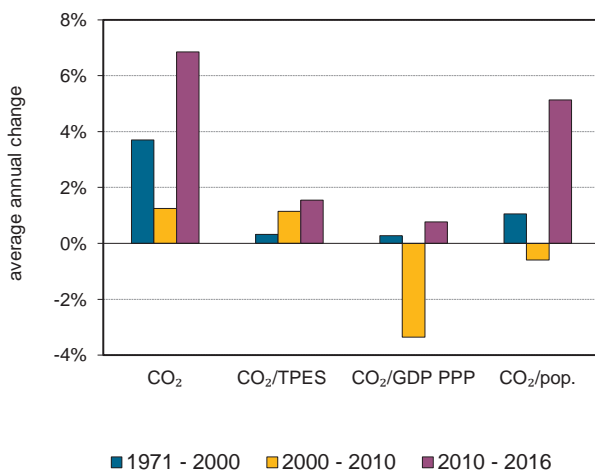
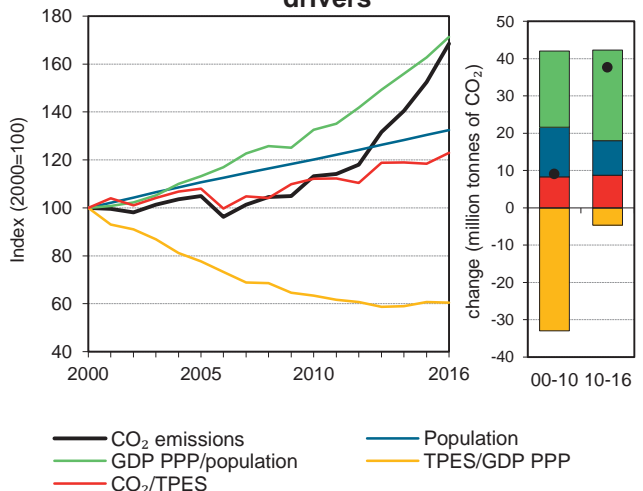


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Philippines

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	38.1	57.3	68.1	71.5	77.1	103.9	114.8	202%
Share of World CO ₂ from fuel combustion	0.2%	0.3%	0.3%	0.3%	0.3%	0.3%	0.4%	
TPES (PJ)	1202	1 408	1 674	1 627	1 692	2 157	2 295	91%
GDP (billion 2010 USD)	94.5	105.2	125.3	156.9	199.6	266.1	284.5	201%
GDP PPP (billion 2010 USD)	243.4	270.9	322.8	404.0	514.0	685.1	732.5	201%
Population (millions)	62	69.8	78.0	86.3	93.7	101.7	103.3	67%
CO ₂ / TPES (tCO ₂ per TJ)	31.7	40.7	40.7	44.0	45.6	48.2	50.0	58%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.16	0.2	0.2	0.2	0.2	0.2	0.2	1%
CO ₂ / population (tCO ₂ per capita)	0.6	0.8	0.9	0.8	0.8	1.0	1.1	81%
Share of electricity output from fossil fuels	55%	63%	57%	68%	74%	75%	76%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	345	469	501	499	489	614	607	76%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	150	179	188	203	273	302	202%
Population index	100	113	126	139	151	164	167	67%
GDP PPP per population index	100	99	105	119	140	171	180	80%
Energy intensity index - TPES / GDP PPP	100	105	105	82	67	64	63	-37%
Carbon intensity index - CO ₂ / TPES	100	128	129	139	144	152	158	58%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	55.9	51.1	7.7	0.0	114.8	202%
Electricity and heat generation	43.9	3.9	7.3	0.0	55.1	507%
Other energy industry own use	-	0.7	0.3	-	1.0	-39%
Manufacturing industries and construction	12.1	4.5	0.2	-	16.8	61%
Transport	-	33.3	-	-	33.3	143%
<i>of which: road</i>	-	28.9	-	-	28.9	151%
Other	-	8.6	-	-	8.6	164%
<i>of which: residential</i>	-	3.0	-	-	3.0	37%
<i>of which: services</i>	-	4.9	-	-	4.9	+
<i>Memo: international marine bunkers</i>	-	0.2	-	-	0.2	-22%
<i>Memo: international aviation bunkers</i>	-	3.9	-	-	3.9	282%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	43.9	2.0	20.5	20.5
Road - oil	28.9	11.5	13.5	33.9
Manufacturing industries - coal	12.1	3.1	5.6	39.6
Main activity prod. elec. and heat - gas	7.3	-	3.4	43.0
Non-specified other - oil	5.6	1.1	2.6	45.6
Manufacturing industries - oil	4.5	7.3	2.1	47.7
Other transport - oil	4.4	2.2	2.1	49.8
Main activity prod. elec. and heat - oil	3.9	7.1	1.8	51.6
Residential - oil	3.0	2.2	1.4	53.0
<i>Memo: total CO₂ from fuel combustion</i>	<i>114.8</i>	<i>38.1</i>	<i>53.5</i>	<i>53.5</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Poland ¹

Figure 1. CO₂ emissions by fuel

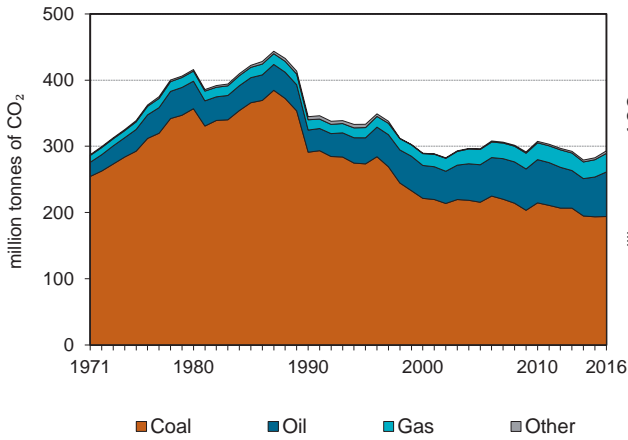


Figure 2. CO₂ emissions by sector

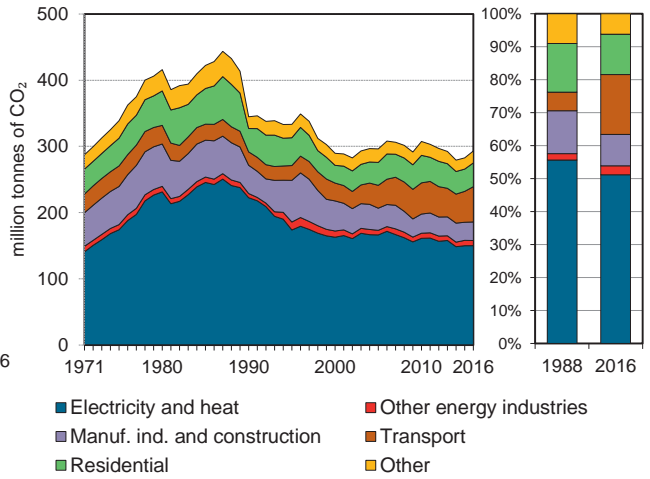


Figure 3. Electricity generation by fuel

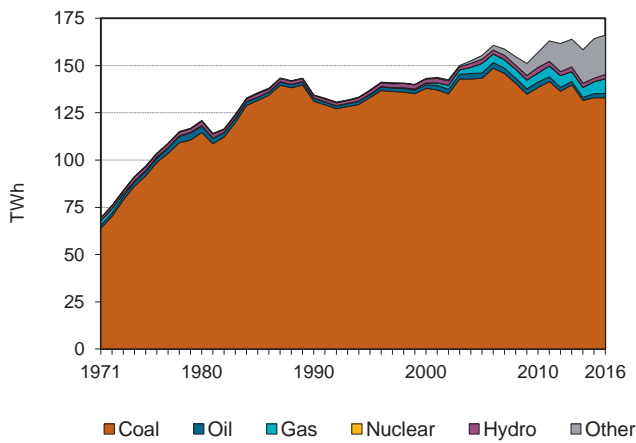


Figure 4. CO₂ from electricity generation: driving factors²

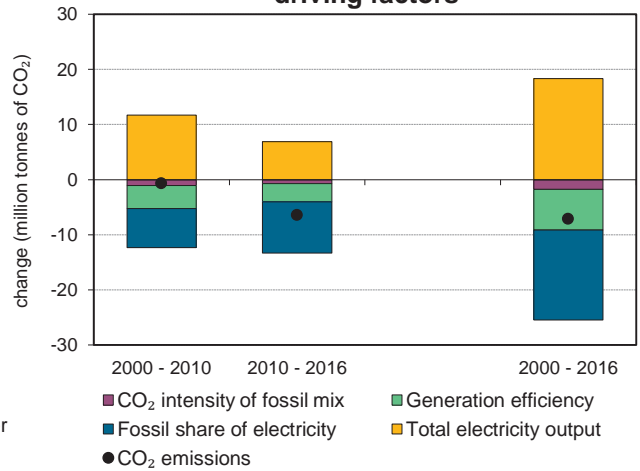


Figure 5. Changes in selected indicators

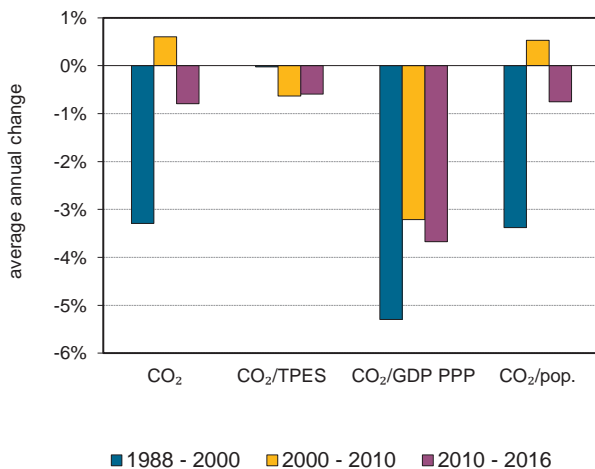
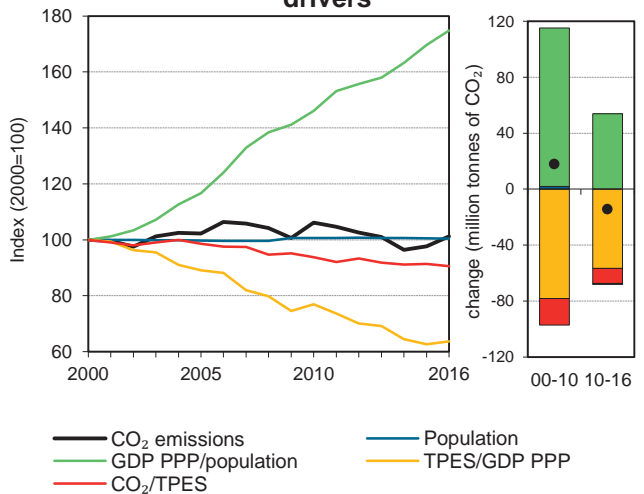


Figure 6. Total CO₂ emissions and drivers³



1. Under the Convention Poland is allowed to use 1988 as its base year.

2. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.

3. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Poland ¹

Key indicators

	1988	1990	1995	2005	2010	2015	2016	%change 88-16
CO ₂ fuel combustion (MtCO ₂)	432.8	344.8	333.3	296.3	307.5	282.7	293.1	-32%
Share of World CO ₂ from fuel combustion	2.2%	1.7%	1.6%	1.1%	1.0%	0.9%	0.9%	
TPES (PJ)	5540	4 317	4 166	3 858	4 208	3 974	4 158	-25%
GDP (billion 2010 USD)	253.5	226.7	252.4	379.8	479.3	556.2	572.7	126%
GDP PPP (billion 2010 USD)	424.3	379.4	422.5	635.0	802.3	930.1	957.7	126%
Population (millions)	37.9	38.0	38.3	38.2	38.5	38.5	38.4	1%
CO ₂ / TPES (tCO ₂ per TJ)	78.1	79.9	80.0	76.8	73.1	71.1	70.5	-10%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.71	1.5	1.3	0.8	0.6	0.5	0.5	-70%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	1.02	0.9	0.8	0.5	0.4	0.3	0.3	-70%
CO ₂ / population (tCO ₂ per capita)	11.4	9.1	8.7	7.8	8.0	7.4	7.6	-33%
Share of electricity output from fossil fuels	0%	99%	99%	97%	93%	86%	86%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	0	1008	922	836	799	730	720	0%
CO₂ emissions and drivers - Kaya decomposition (1988=100) ²								
CO ₂ emissions index	100	80	77	68	71	65	68	-32%
Population index	100	100	101	101	102	102	101	1%
GDP PPP per population index	100	89	98	148	186	216	222	122%
Energy intensity index - TPES / GDP PPP	100	87	76	47	40	33	33	-67%
Carbon intensity index - CO ₂ / TPES	100	102	102	98	94	91	90	-10%

1. Under the Convention Poland is allowed to use 1988 as its base year. 2. Please see Part I for methodological notes.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ³	Total	%change 88-16	
CO₂ fuel combustion	194.0		67.3	28.1	3.8	293.1	-32%
Electricity and heat generation	144.2		1.5	4.0	0.4	150.0	-38%
Other energy industry own use	2.2		3.1	2.4	0.0	7.8	-7%
Manufacturing industries and construction	14.9		1.9	8.0	3.3	28.1	-50%
Transport	-		52.4	0.9	-	53.3	121%
<i>of which: road</i>	-		52.0	0.0	-	52.1	153%
Other	32.6		8.5	12.8	0.0	53.9	-48%
<i>of which: residential</i>	26.2		1.6	8.1	-	35.9	-44%
<i>of which: services</i>	2.6		1.3	4.5	0.0	8.5	-72%
<i>Memo: international marine bunkers</i>	-		0.6	-	-	0.6	-65%
<i>Memo: international aviation bunkers</i>	-		2.0	-	-	2.0	80%

3. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1988 CO ₂ emissions (MtCO ₂)	Share in total GHG ⁴ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	140.5	168.1	36.5	36.5
Road - oil	52.0	20.5	13.5	50.0
Residential - coal	26.2	57.9	6.8	56.8
Manufacturing industries - coal	14.9	41.1	3.9	60.6
Residential - gas	8.1	5.8	2.1	62.7
Manufacturing industries - gas	8.0	7.9	2.1	64.8
Non-specified other - oil	6.9	4.0	1.8	66.6
Non-specified other sectors - coal	6.5	34.0	1.7	68.3
Non-specified other - gas	4.6	0.8	1.2	69.5
<i>Memo: total CO₂ from fuel combustion</i>	<i>293.1</i>	<i>432.8</i>	<i>76.1</i>	<i>76.1</i>

4. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Portugal

Figure 1. CO₂ emissions by fuel

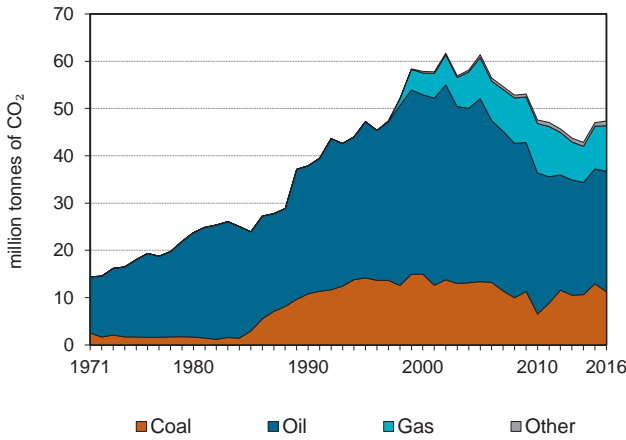


Figure 2. CO₂ emissions by sector

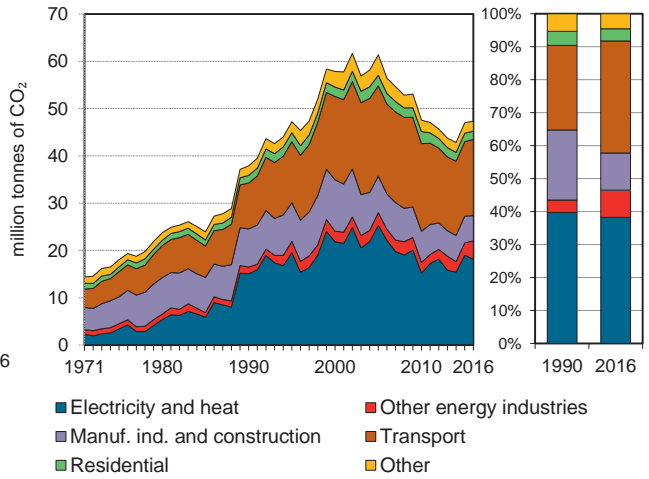


Figure 3. Electricity generation by fuel

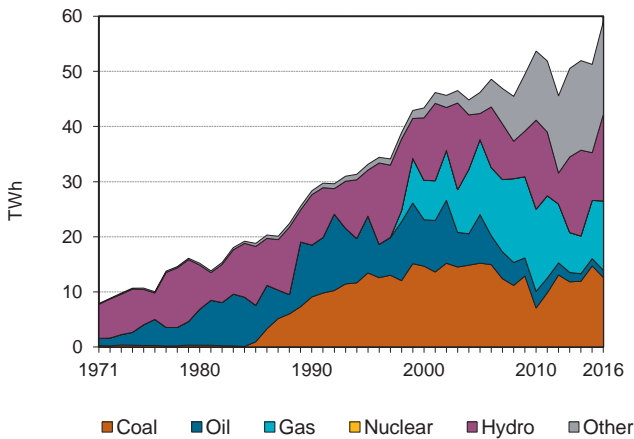


Figure 4. CO₂ from electricity generation: driving factors¹

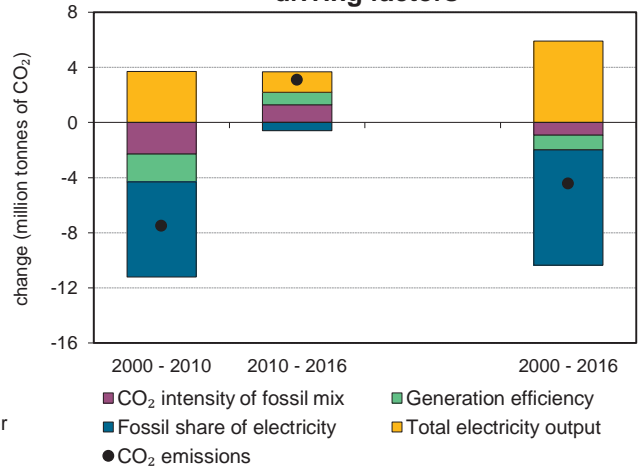


Figure 5. Changes in selected indicators

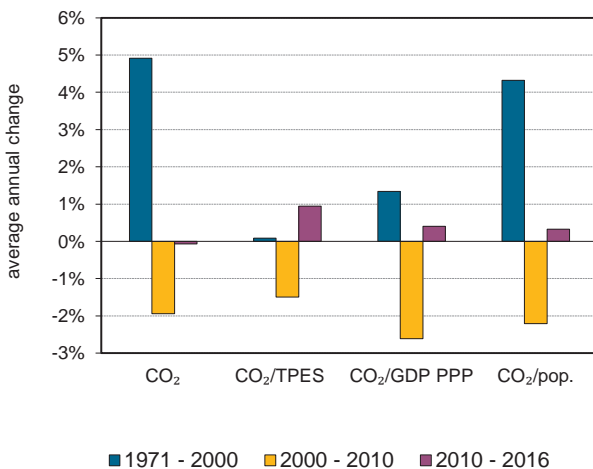
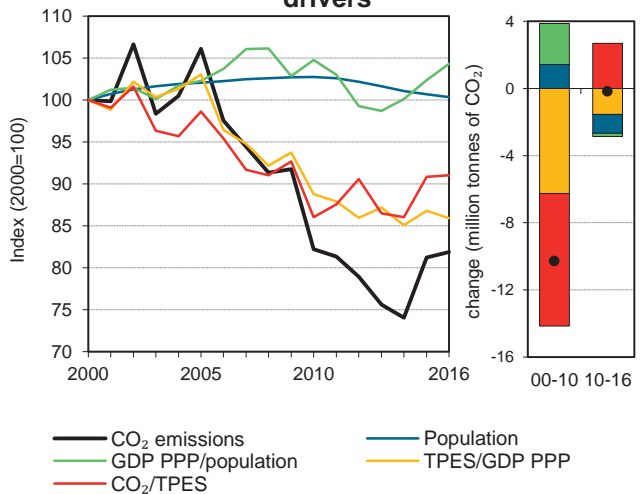


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Portugal

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	37.9	47.2	57.9	61.4	47.6	47.0	47.4	25%
Share of World CO ₂ from fuel combustion	0.2%	0.2%	0.3%	0.2%	0.2%	0.2%	0.2%	
TPES (PJ)	703	845	1 030	1 108	984	921	926	32%
GDP (billion 2010 USD)	166.6	181.3	221.4	231.1	238.3	228.1	231.7	39%
GDP PPP (billion 2010 USD)	202	219.9	268.5	280.3	289.0	276.6	281.1	39%
Population (millions)	10	10.0	10.3	10.5	10.6	10.4	10.3	3%
CO ₂ / TPES (tCO ₂ per TJ)	53.9	55.9	56.2	55.4	48.3	51.0	51.1	-5%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.23	0.3	0.3	0.3	0.2	0.2	0.2	-10%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.19	0.2	0.2	0.2	0.2	0.2	0.2	-10%
CO ₂ / population (tCO ₂ per capita)	3.8	4.7	5.6	5.8	4.5	4.5	4.6	21%
Share of electricity output from fossil fuels	65%	72%	70%	82%	47%	53%	45%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	528	585	493	527	258	347	287	-46%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	125	153	162	126	124	125	25%
Population index	100	100	103	105	106	104	103	3%
GDP PPP per population index	100	108	129	132	135	132	135	35%
Energy intensity index - TPES / GDP PPP	100	111	110	114	98	96	95	-5%
Carbon intensity index - CO ₂ / TPES	100	104	104	103	90	95	95	-5%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16	
CO₂ fuel combustion	11.3		25.5	9.6	1.0	47.4	25%
Electricity and heat generation	11.2		0.8	5.6	0.5	18.1	20%
Other energy industry own use	-		3.7	0.2	-	3.9	172%
Manufacturing industries and construction	0.1		2.1	2.6	0.5	5.3	-34%
Transport	-		16.1	0.0	-	16.1	66%
<i>of which: road</i>	-		15.3	0.0	-	15.3	68%
Other	-		2.8	1.1	-	3.9	7%
<i>of which: residential</i>	-		1.2	0.6	-	1.7	7%
<i>of which: services</i>	-		0.5	0.5	-	1.0	90%
<i>Memo: international marine bunkers</i>	-		2.0	-	-	2.0	5%
<i>Memo: international aviation bunkers</i>	-		3.4	-	-	3.4	150%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	15.3	9.1	22.1	22.1
Main activity prod. elec. and heat - coal	11.2	8.0	16.2	38.4
Other energy industry own use - oil	3.7	1.4	5.3	43.7
Main activity prod. elec. and heat - gas	2.9	-	4.1	47.8
Unallocated autoproducers - gas	2.7	-	3.9	51.7
Manufacturing industries - gas	2.6	-	3.8	55.5
Manufacturing industries - oil	2.1	5.6	3.1	58.6
Non-specified other - oil	1.6	2.0	2.3	60.9
Residential - oil	1.2	1.5	1.7	62.6
<i>Memo: total CO₂ from fuel combustion</i>	47.4	37.9	68.6	68.6

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Qatar

Figure 1. CO₂ emissions by fuel

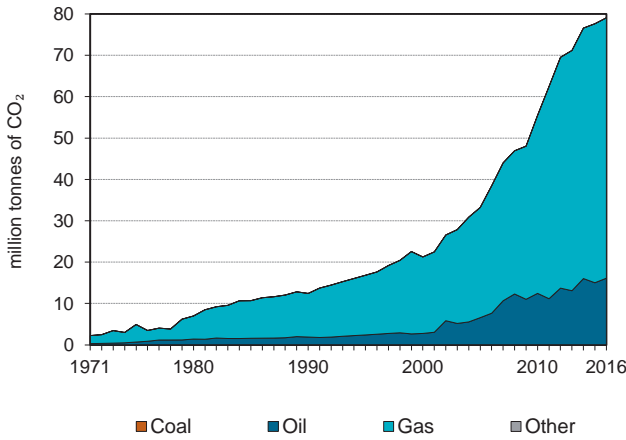


Figure 2. CO₂ emissions by sector

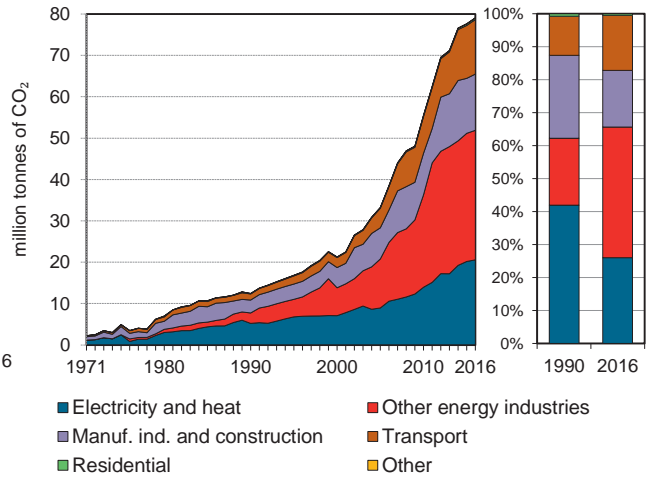


Figure 3. Electricity generation by fuel

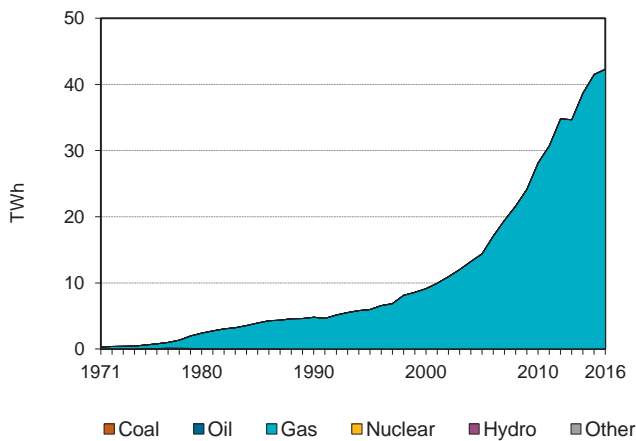


Figure 4. CO₂ from electricity generation: driving factors¹

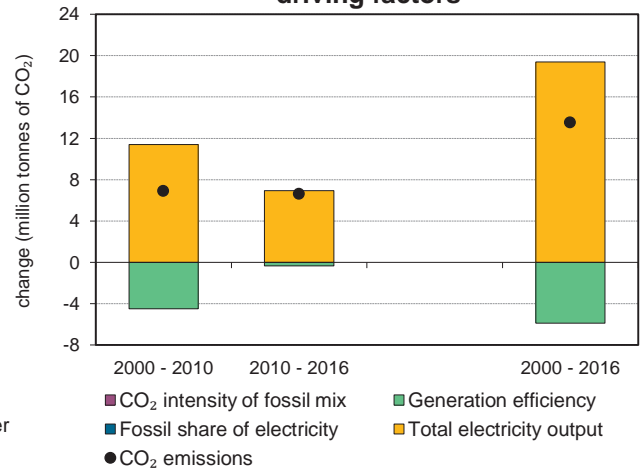


Figure 5. Changes in selected indicators

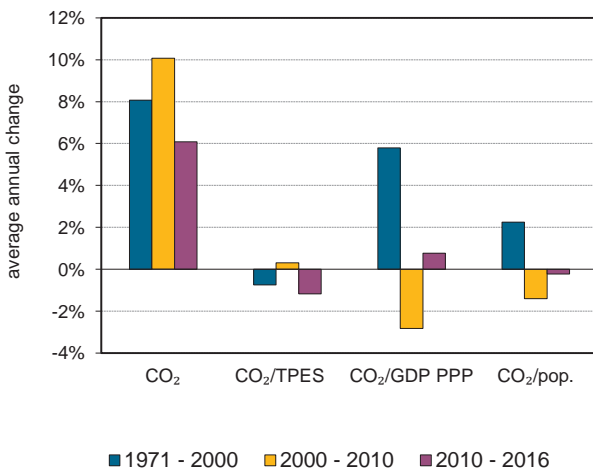
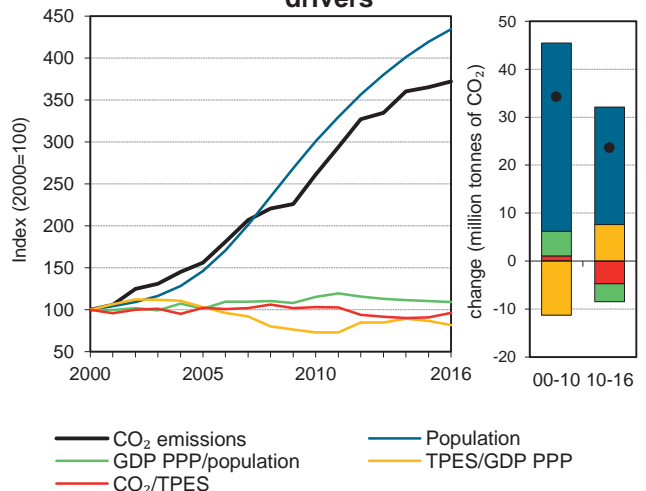


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Qatar

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	12.4	16.8	21.3	33.2	55.5	77.6	79.1	536%
Share of World CO ₂ from fuel combustion	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	
TPES (PJ)	273	341	457	698	1 158	1 837	1 771	548%
GDP (billion 2010 USD)	18.9	21.2	36.0	53.4	125.1	167.0	170.7	803%
GDP PPP (billion 2010 USD)	33	37.0	62.9	93.0	218.2	291.2	297.6	803%
Population (millions)	0.5	0.5	0.6	0.9	1.8	2.5	2.6	440%
CO ₂ / TPES (tCO ₂ per TJ)	45.5	49.3	46.5	47.6	47.9	42.3	44.7	-2%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.66	0.8	0.6	0.6	0.4	0.5	0.5	-30%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.38	0.5	0.3	0.4	0.3	0.3	0.3	-29%
CO ₂ / population (tCO ₂ per capita)	26.1	32.8	35.9	38.4	31.2	31.3	30.8	18%
Share of electricity output from fossil fuels	100%	100%	100%	100%	100%	100%	100%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	1082	1137	775	621	496	486	486	-55%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	135	171	267	446	624	636	536%
Population index	100	108	124	182	374	521	540	440%
GDP PPP per population index	100	104	153	155	177	169	167	67%
Energy intensity index - TPES / GDP PPP	100	111	88	90	64	76	72	-28%
Carbon intensity index - CO ₂ / TPES	100	108	102	105	105	93	98	-2%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	16.1	62.9	-	79.1	536%
Electricity and heat generation	-	-	20.6	-	20.6	295%
Other energy industry own use	-	0.4	30.9	-	31.3	+
Manufacturing industries and construction	-	2.2	11.4	-	13.6	335%
Transport	-	13.2	-	-	13.2	795%
<i>of which: road</i>	-	13.2	-	-	13.2	795%
Other	-	0.4	-	-	0.4	325%
<i>of which: residential</i>	-	0.4	-	-	0.4	325%
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	5.5	-	-	5.5	+

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Other energy industry own use - gas	30.9	2.2	18.3	18.3
Unallocated autoproducers - gas	18.5	4.0	10.9	29.3
Road - oil	13.2	1.5	7.8	37.1
Manufacturing industries - gas	11.4	3.1	6.8	43.8
Manufacturing industries - oil	2.2	-	1.3	45.1
Main activity prod. elec. and heat - gas	2.1	1.2	1.2	46.4
Residential - oil	0.4	0.1	0.2	46.6
Other energy industry own use - oil	0.4	0.3	0.2	46.8
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	79.1	12.4	46.8	46.8

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Romania ¹

Figure 1. CO₂ emissions by fuel

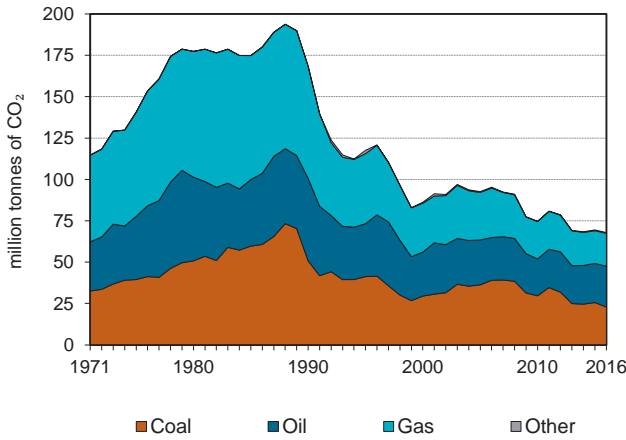


Figure 2. CO₂ emissions by sector

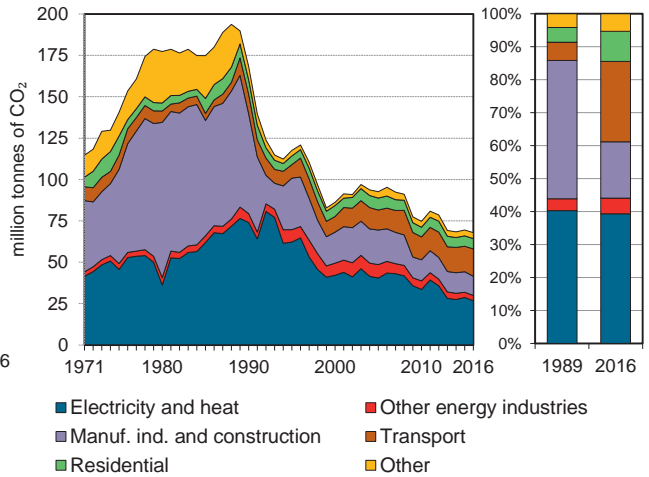


Figure 3. Electricity generation by fuel

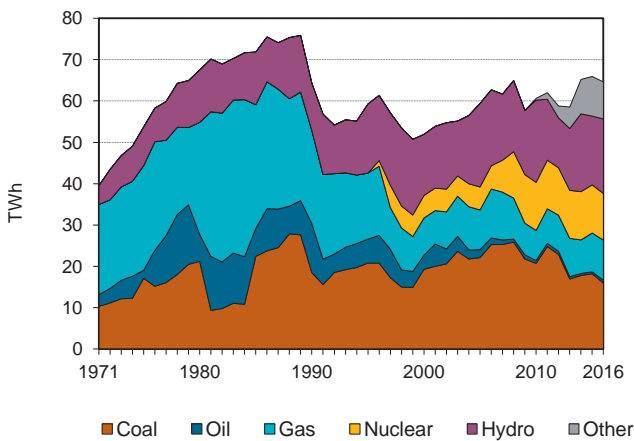


Figure 4. CO₂ from electricity generation: driving factors²

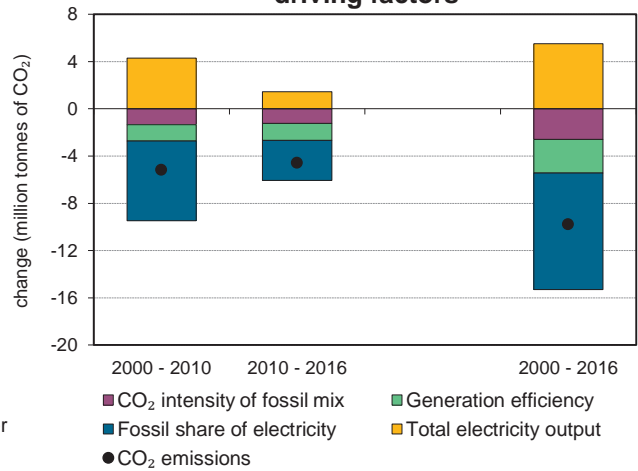


Figure 5. Changes in selected indicators

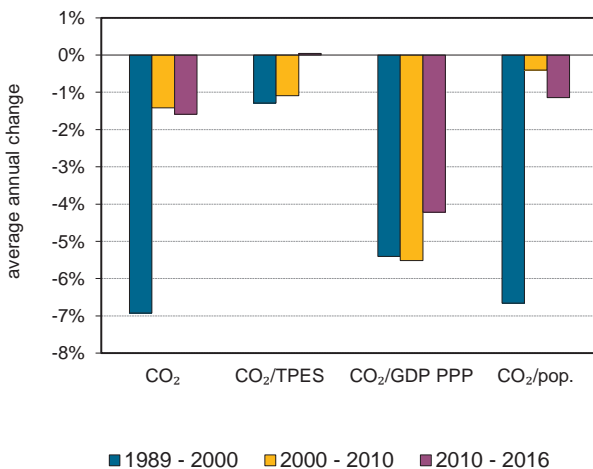
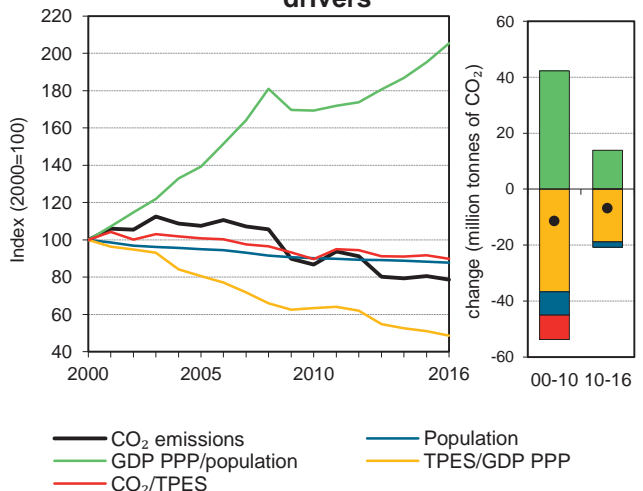


Figure 6. Total CO₂ emissions and drivers³



1. Under the Convention Romania is allowed to use 1989 as its base year.

2. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.

3. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Romania ¹

Key indicators

	1989	1990	1995	2005	2010	2015	2016	%change 89-16
CO ₂ fuel combustion (MtCO ₂)	189.9	168.3	117.6	92.6	74.7	69.5	67.9	-64%
Share of World CO ₂ from fuel combustion	0.9%	0.8%	0.6%	0.3%	0.3%	0.2%	0.2%	
TPES (PJ)	2897	2 607	1 951	1 616	1 467	1 333	1 329	-54%
GDP (billion 2010 USD)	131.4	124.0	111.4	145.5	168.0	189.5	198.6	51%
GDP PPP (billion 2010 USD)	271.8	256.6	230.4	301.0	347.5	392.2	410.2	51%
Population (millions)	23.2	23.2	22.7	21.3	20.2	19.8	19.7	-15%
CO ₂ / TPES (tCO ₂ per TJ)	65.5	64.6	60.3	57.3	50.9	52.1	51.1	-22%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.45	1.4	1.1	0.6	0.4	0.4	0.3	-76%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.7	0.7	0.5	0.3	0.2	0.2	0.2	-76%
CO ₂ / population (tCO ₂ per capita)	8.2	7.3	5.2	4.3	3.7	3.5	3.4	-58%
Share of electricity output from fossil fuels	0%	82%	72%	57%	47%	43%	41%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	0	865	752	500	417	339	321	0%
CO₂ emissions and drivers - Kaya decomposition (1989=100) ²								
CO ₂ emissions index	100	89	62	49	39	37	36	-64%
Population index	100	100	98	92	87	86	85	-15%
GDP PPP per population index	100	94	87	120	146	169	177	77%
Energy intensity index - TPES / GDP PPP	100	95	79	50	40	32	30	-70%
Carbon intensity index - CO ₂ / TPES	100	99	92	87	78	80	78	-22%

1. Under the Convention Romania is allowed to use 1989 as its base year. 2. Please see Part I for methodological notes.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ³	Total	%change 89-16
CO₂ fuel combustion	22.9	24.7	19.9	0.5	67.9	-64%
Electricity and heat generation	19.2	1.0	6.5	0.0	26.7	-65%
Other energy industry own use	0.0	2.1	1.1	-	3.2	-54%
Manufacturing industries and construction	3.4	2.9	4.9	0.4	11.7	-85%
Transport	-	16.5	0.0	-	16.5	56%
<i>of which: road</i>	-	15.9	-	-	15.9	76%
Other	0.3	2.2	7.3	0.0	9.8	-40%
<i>of which: residential</i>	0.2	0.6	5.4	-	6.3	-26%
<i>of which: services</i>	0.0	0.3	1.8	0.0	2.1	x
<i>Memo: international marine bunkers</i>	-	0.1	-	-	0.1	x
<i>Memo: international aviation bunkers</i>	-	0.8	-	-	0.8	1%

3. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1989 CO ₂ emissions (MtCO ₂)	Share in total GHG ⁴ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	18.5	35.4	16.0	16.0
Road - oil	15.9	9.1	13.8	29.8
Residential - gas	5.4	5.1	4.6	34.4
Manufacturing industries - gas	4.9	45.9	4.2	38.6
Main activity prod. elec. and heat - gas	4.1	22.4	3.6	42.2
Manufacturing industries - coal	3.4	23.7	3.0	45.2
Manufacturing industries - oil	2.9	9.9	2.5	47.7
Unallocated autoproducers - gas	2.4	-	2.1	49.8
Other energy industry own use - oil	2.1	5.8	1.8	51.6
<i>Memo: total CO₂ from fuel combustion</i>	67.9	189.9	58.7	58.7

4. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Russian Federation

Figure 1. CO₂ emissions by fuel

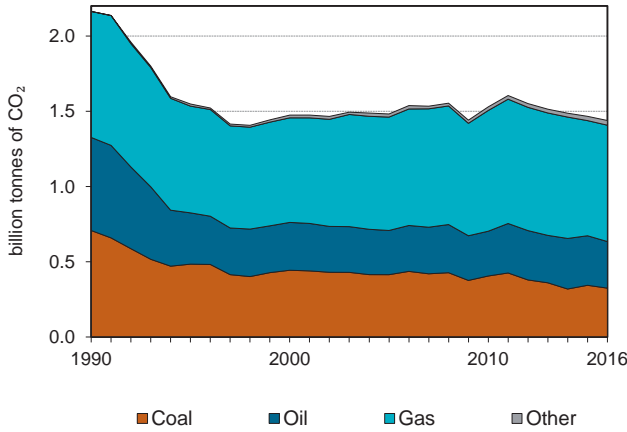


Figure 2. CO₂ emissions by sector

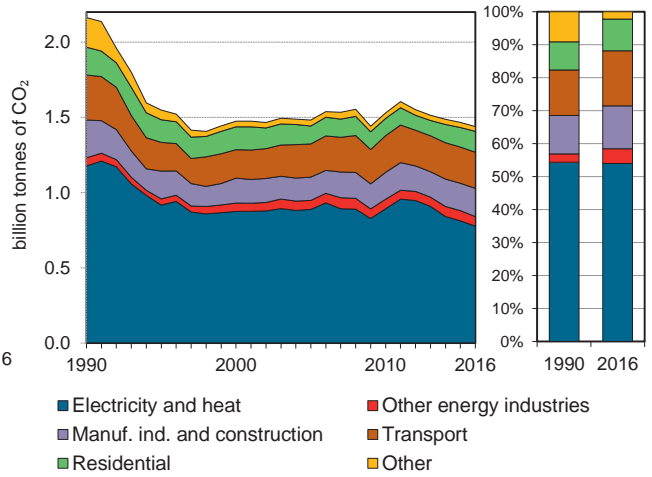


Figure 3. Electricity generation by fuel

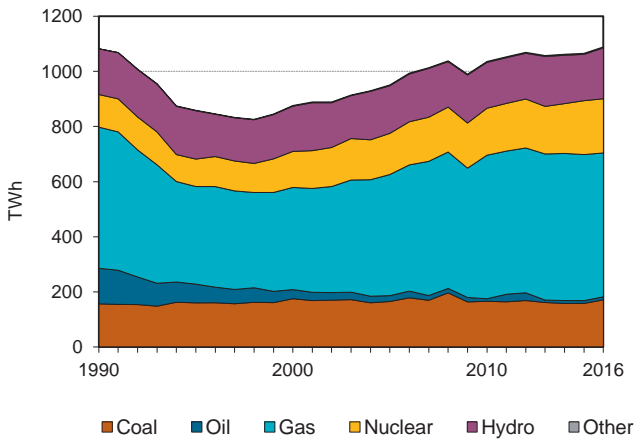


Figure 4. CO₂ from electricity generation: driving factors¹

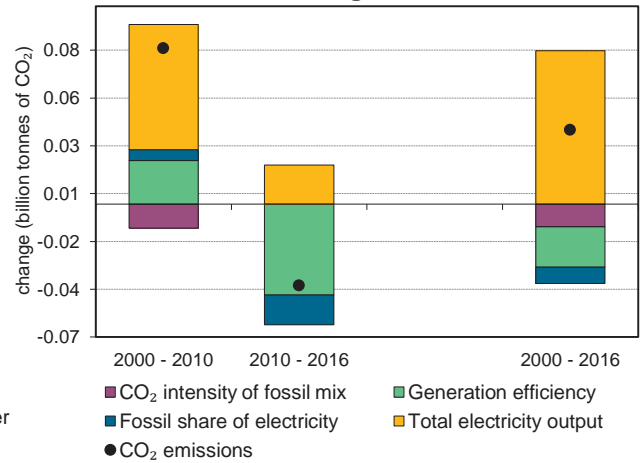


Figure 5. Changes in selected indicators

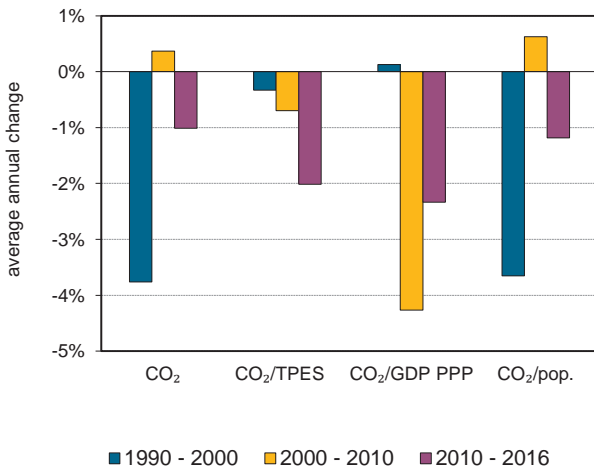
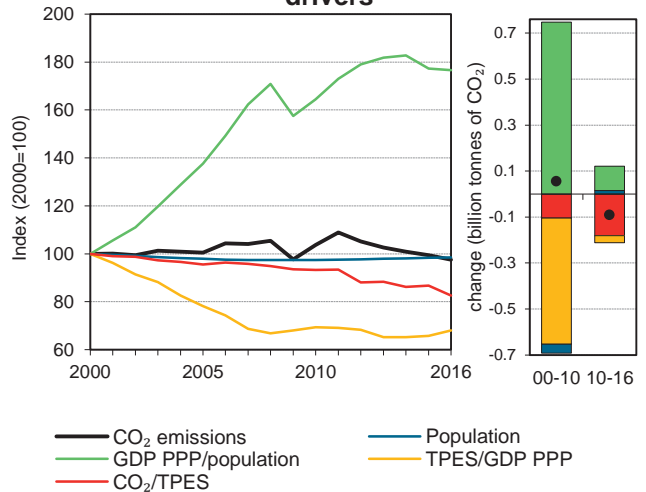


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Russian Federation

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	2163.5	1 548.2	1 474.4	1 481.9	1 529.2	1 466.3	1 438.6	-34%
Share of World CO ₂ from fuel combustion	10.5%	7.2%	6.4%	5.5%	5.0%	4.5%	4.5%	
TPES (PJ)	36816	26 660	25 932	27 287	28 847	29 726	30 662	-17%
GDP (billion 2010 USD)	1413.9	878.3	951.6	1 281.3	1 524.9	1 631.6	1 628.0	15%
GDP PPP (billion 2010 USD)	2714.9	1 686.5	1 827.2	2 460.4	2 928.1	3 184.0	3 176.8	17%
Population (millions)	148.3	148.4	146.6	143.5	142.8	144.1	144.3	-3%
CO ₂ / TPES (tCO ₂ per TJ)	58.8	58.1	56.9	54.3	53.0	49.3	46.9	-20%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.53	1.8	1.5	1.2	1.0	0.9	0.9	-42%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.8	0.9	0.8	0.6	0.5	0.5	0.5	-43%
CO ₂ / population (tCO ₂ per capita)	14.6	10.4	10.1	10.3	10.7	10.2	10.0	-32%
Share of electricity output from fossil fuels	74%	68%	66%	66%	67%	66%	65%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	412	368	400	443	418	395	358	-13%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	72	68	68	71	68	66	-34%
Population index	100	100	99	97	96	97	97	-3%
GDP PPP per population index	100	62	68	94	112	121	120	20%
Energy intensity index - TPES / GDP PPP	100	117	105	82	73	69	71	-29%
Carbon intensity index - CO ₂ / TPES	100	99	97	92	90	84	80	-20%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	324.3	309.7	773.5	31.2	1 438.6	-34%
Electricity and heat generation	256.7	25.1	472.3	22.7	776.8	-34%
Other energy industry own use	4.8	30.4	27.3	0.9	63.3	15%
Manufacturing industries and construction	50.1	45.7	85.5	6.5	187.8	-25%
Transport	-	170.8	69.5	-	240.2	-20%
<i>of which: road</i>	-	145.5	0.4	-	145.8	-5%
Other	12.7	37.7	118.9	1.1	170.4	-55%
<i>of which: residential</i>	7.5	20.7	110.5	-	138.6	-25%
<i>of which: services</i>	4.9	6.6	5.4	0.8	17.7	-83%
<i>Memo: international marine bunkers</i>	-	33.6	-	-	33.6	466%
<i>Memo: international aviation bunkers</i>	-	14.6	-	-	14.6	-45%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - gas	315.3	348.9	11.8	11.8
Main activity prod. elec. and heat - coal	186.8	354.6	7.0	18.8
Unallocated autoproducers - gas	157.0	186.0	5.9	24.7
Road - oil	145.5	151.3	5.5	30.2
Residential - gas	110.5	110.7	4.1	34.3
Manufacturing industries - gas	85.5	71.6	3.2	37.6
Unallocated autoproducers - coal	69.8	87.8	2.6	40.2
Other transport - gas	69.1	77.3	2.6	42.8
Manufacturing industries - coal	50.1	103.2	1.9	44.6
<i>Memo: total CO₂ from fuel combustion</i>	<i>1438.6</i>	<i>2163.5</i>	<i>54.0</i>	<i>54.0</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Saudi Arabia

Figure 1. CO₂ emissions by fuel

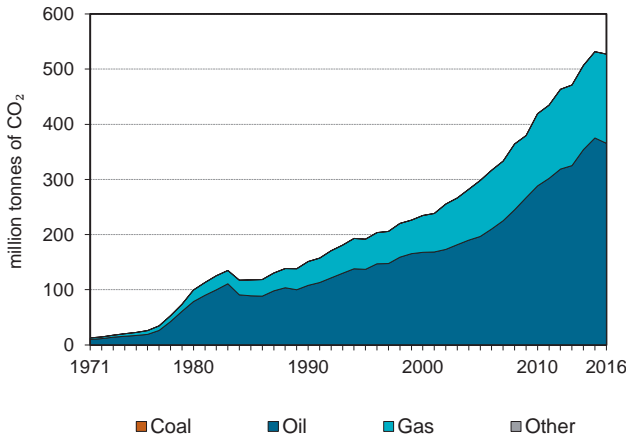


Figure 2. CO₂ emissions by sector

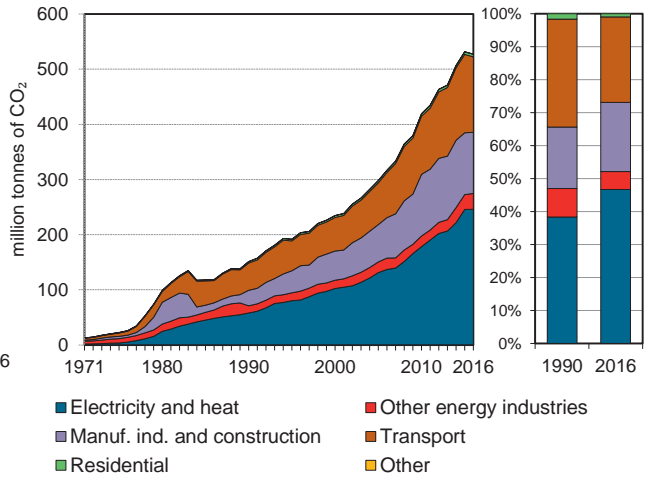


Figure 3. Electricity generation by fuel

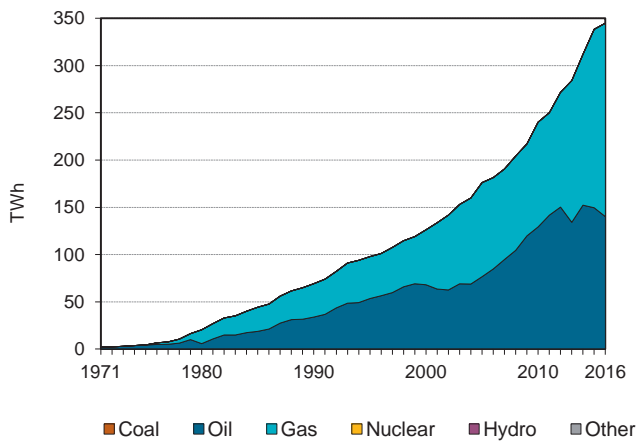


Figure 4. CO₂ from electricity generation: driving factors¹

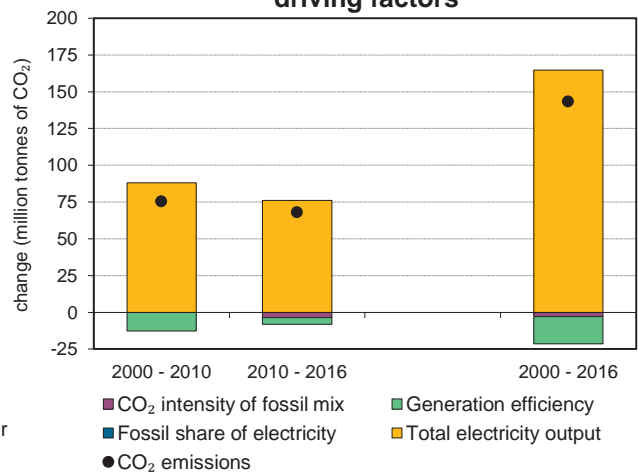


Figure 5. Changes in selected indicators

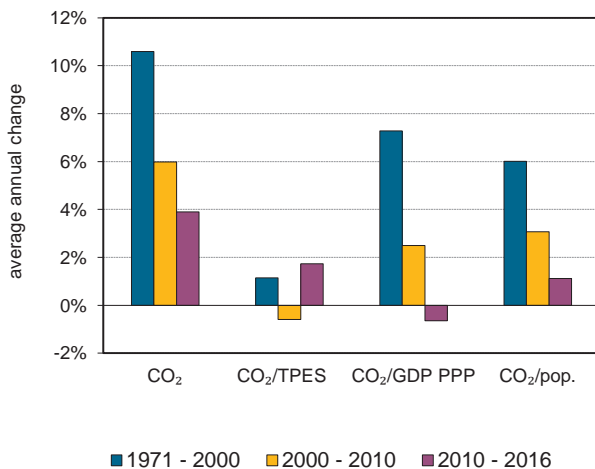
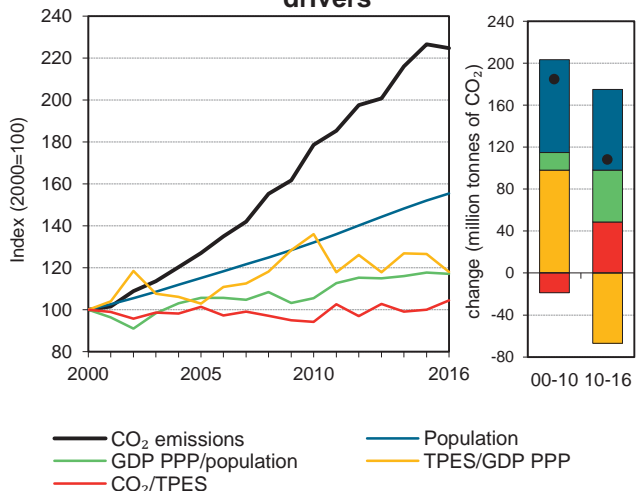


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Saudi Arabia

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	151.1	191.7	234.6	298.0	419.2	531.6	527.2	249%
Share of World CO ₂ from fuel combustion	0.7%	0.9%	1.0%	1.1%	1.4%	1.7%	1.6%	
TPES (PJ)	2429	3 538	4 097	5 131	7 767	9 283	8 810	263%
GDP (billion 2010 USD)	293.9	349.4	379.2	461.6	528.2	678.7	690.6	135%
GDP PPP (billion 2010 USD)	679.2	807.4	876.3	1 066.6	1 220.5	1 568.3	1 595.6	135%
Population (millions)	16.3	18.7	20.8	23.9	27.4	31.6	32.3	98%
CO ₂ / TPES (tCO ₂ per TJ)	62.2	54.2	57.3	58.1	54.0	57.3	59.8	-4%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.51	0.5	0.6	0.6	0.8	0.8	0.8	49%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.22	0.2	0.3	0.3	0.3	0.3	0.3	49%
CO ₂ / population (tCO ₂ per capita)	9.3	10.2	11.3	12.5	15.3	16.8	16.3	76%
Share of electricity output from fossil fuels	100%	100%	100%	100%	100%	100%	100%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	837	820	812	745	743	726	714	-15%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	127	155	197	277	352	349	249%
Population index	100	115	127	146	168	193	198	98%
GDP PPP per population index	100	104	101	107	107	119	119	19%
Energy intensity index - TPES / GDP PPP	100	123	131	135	178	166	154	54%
Carbon intensity index - CO ₂ / TPES	100	87	92	93	87	92	96	-4%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	365.6	161.7	-	527.2	249%
Electricity and heat generation	-	128.8	117.3	-	246.1	325%
Other energy industry own use	-	21.7	7.0	-	28.6	119%
Manufacturing industries and construction	-	73.4	37.4	-	110.8	293%
Transport	-	136.9	-	-	136.9	177%
<i>of which: road</i>	-	134.0	-	-	134.0	180%
Other	-	4.9	-	-	4.9	91%
<i>of which: residential</i>	-	4.9	-	-	4.9	91%
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	10.7	-	-	10.7	85%
<i>Memo: international aviation bunkers</i>	-	8.6	-	-	8.6	77%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	134.0	47.8	19.1	19.1
Main activity prod. elec. and heat - oil	104.4	28.6	14.9	33.9
Manufacturing industries - oil	73.4	16.1	10.4	44.4
Unallocated autoproducers - gas	69.0	17.8	9.8	54.2
Main activity prod. elec. and heat - gas	48.3	11.6	6.9	61.0
Manufacturing industries - gas	37.4	12.0	5.3	66.4
Unallocated autoproducers - oil	24.4	-	3.5	69.8
Other energy industry own use - oil	21.7	11.2	3.1	72.9
Other energy industry own use - gas	7.0	1.8	1.0	73.9
<i>Memo: total CO₂ from fuel combustion</i>	<i>527.2</i>	<i>151.1</i>	<i>75.0</i>	<i>75.0</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Senegal

Figure 1. CO₂ emissions by fuel

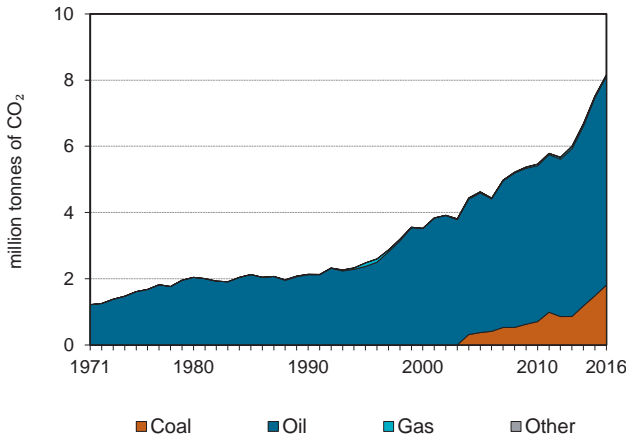


Figure 2. CO₂ emissions by sector

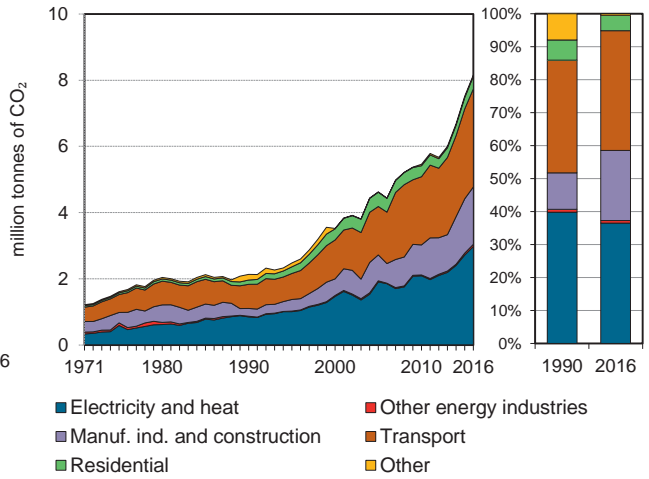


Figure 3. Electricity generation by fuel

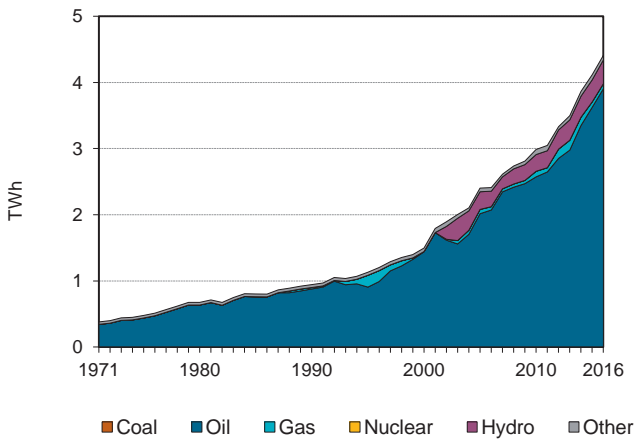


Figure 4. CO₂ from electricity generation: driving factors¹

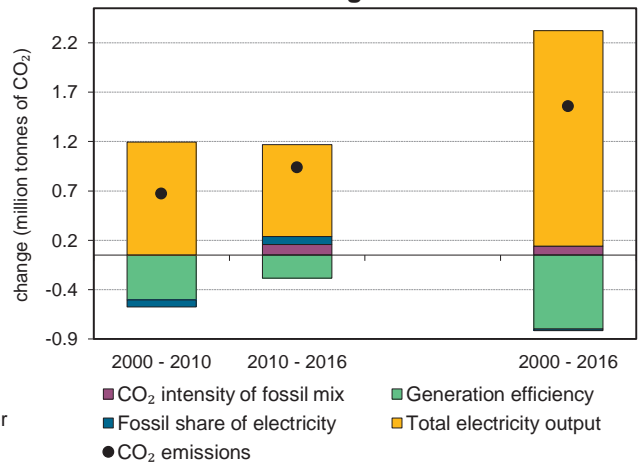


Figure 5. Changes in selected indicators

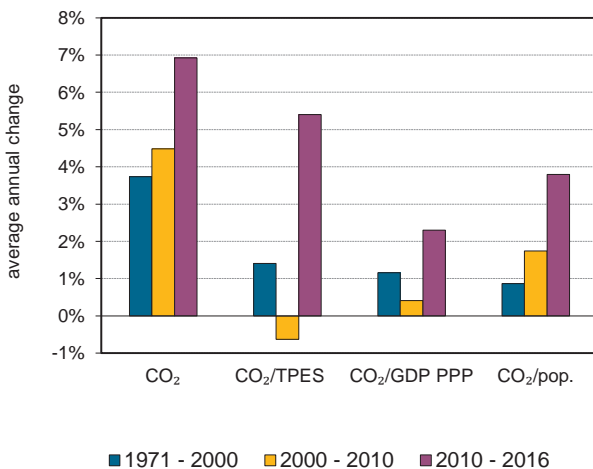
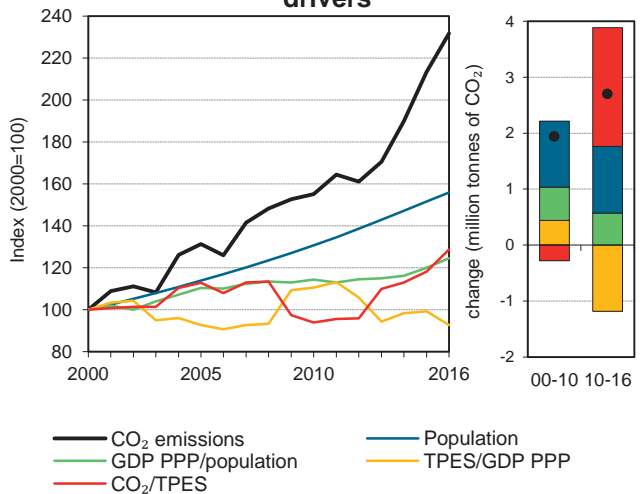


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Senegal

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	2.1	2.5	3.5	4.6	5.5	7.5	8.2	282%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	71	78	100	117	166	181	181	156%
GDP (billion 2010 USD)	6.4	7.1	8.7	10.9	12.9	15.8	16.9	164%
GDP PPP (billion 2010 USD)	13.7	15.1	18.5	23.2	27.6	33.7	35.9	163%
Population (millions)	7.6	8.7	9.9	11.3	12.9	15.0	15.4	104%
CO ₂ / TPES (tCO ₂ per TJ)	30.2	31.7	35.1	39.6	32.9	41.5	45.2	49%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.33	0.4	0.4	0.4	0.4	0.5	0.5	45%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.16	0.2	0.2	0.2	0.2	0.2	0.2	46%
CO ₂ / population (tCO ₂ per capita)	0.3	0.3	0.4	0.4	0.4	0.5	0.5	88%
Share of electricity output from fossil fuels	95%	96%	90%	82%	86%	89%	89%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	899	889	915	749	680	655	668	-26%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	116	165	217	256	352	382	282%
Population index	100	116	131	149	171	198	204	104%
GDP PPP per population index	100	96	104	114	118	124	129	29%
Energy intensity index - TPES / GDP PPP	100	100	105	97	116	104	97	-3%
Carbon intensity index - CO ₂ / TPES	100	105	116	131	109	137	149	49%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	1.8	6.3	0.0	-	8.2	282%
Electricity and heat generation	0.5	2.4	0.0	-	3.0	251%
Other energy industry own use	-	0.1	-	-	0.1	229%
Manufacturing industries and construction	1.3	0.5	-	-	1.7	637%
Transport	-	3.0	-	-	3.0	306%
<i>of which: road</i>	-	2.8	-	-	2.8	323%
Other	-	0.4	-	-	0.4	40%
<i>of which: residential</i>	-	0.4	-	-	0.4	192%
<i>of which: services</i>	-	0.0	-	-	0.0	x
<i>Memo: international marine bunkers</i>	-	0.4	-	-	0.4	287%
<i>Memo: international aviation bunkers</i>	-	0.7	-	-	0.7	46%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	2.8	0.7	12.3	12.3
Main activity prod. elec. and heat - oil	2.1	0.8	9.3	21.6
Manufacturing industries - coal	1.3	-	5.5	27.1
Unallocated autoproducers - coal	0.5	-	2.4	29.5
Manufacturing industries - oil	0.5	0.2	2.1	31.6
Residential - oil	0.4	0.1	1.7	33.2
Unallocated autoproducers - oil	0.3	0.0	1.1	34.4
Other transport - oil	0.1	0.1	0.6	35.0
Other energy industry own use - oil	0.1	0.0	0.3	35.3
<i>Memo: total CO₂ from fuel combustion</i>	8.2	2.1	35.6	35.6

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Serbia¹

Figure 1. CO₂ emissions by fuel

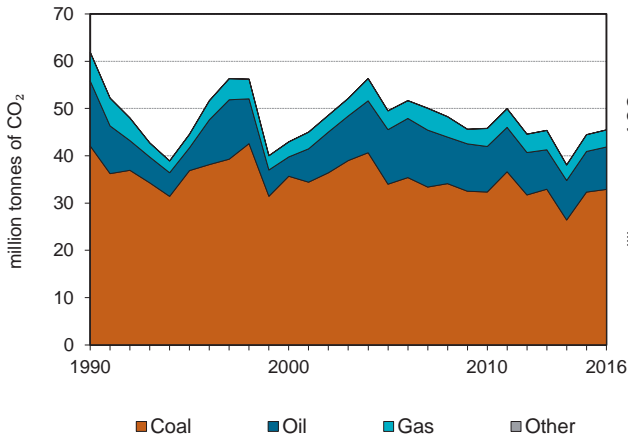


Figure 2. CO₂ emissions by sector

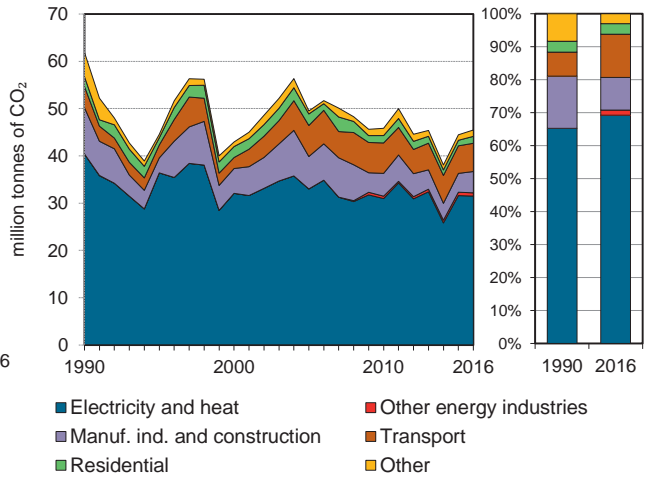


Figure 3. Electricity generation by fuel

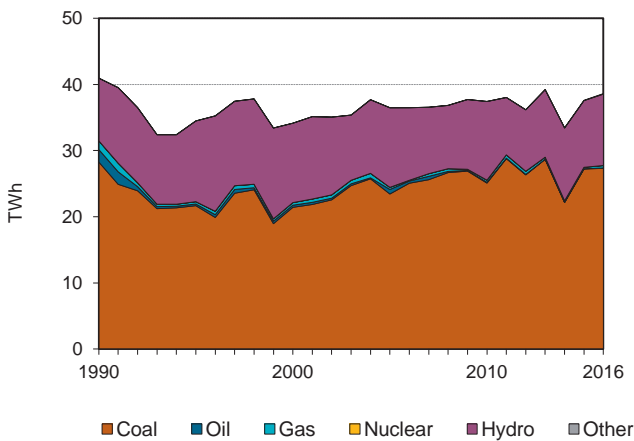


Figure 4. CO₂ from electricity generation: driving factors²

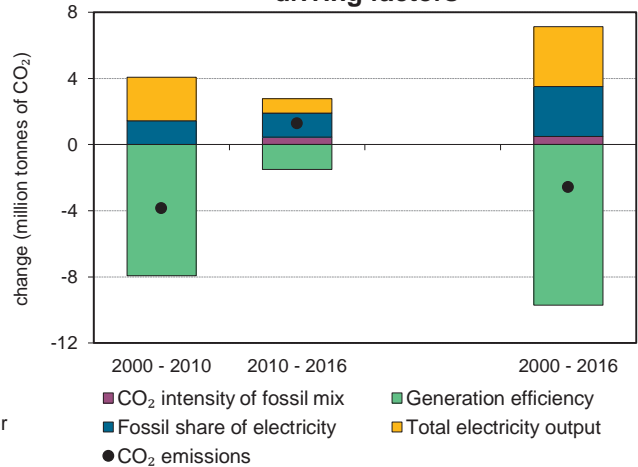


Figure 5. Changes in selected indicators

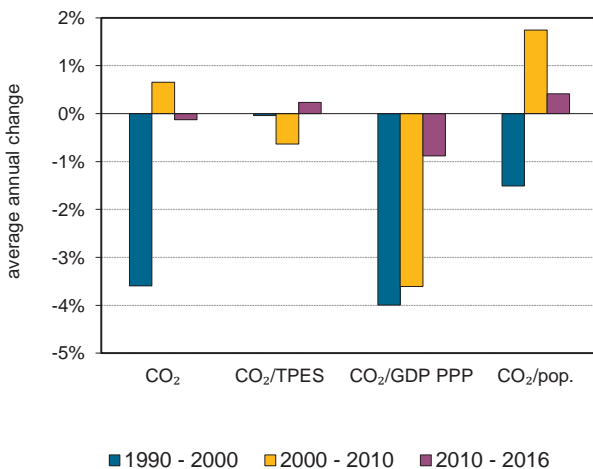
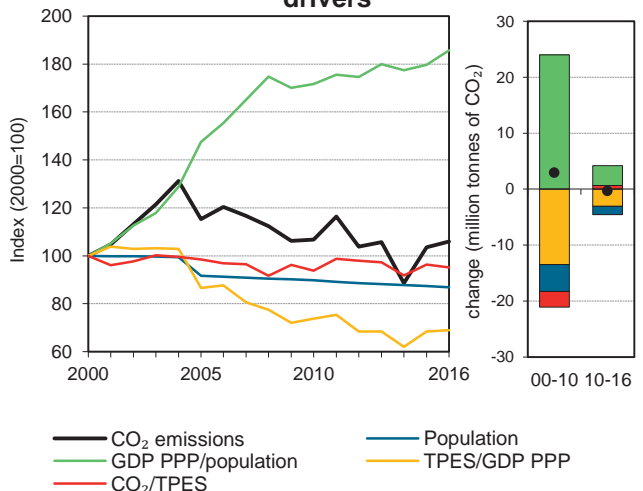


Figure 6. Total CO₂ emissions and drivers³



1. Data for Serbia include Montenegro until 2004 and Kosovo until 1999.

2. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.

3. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Serbia ¹

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	61.9	44.5	42.9	49.5	45.8	44.5	45.5	-27%
Share of World CO ₂ from fuel combustion	0.3%	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	
TPES (PJ)	825	577	575	673	654	618	640	-23%
GDP (billion 2010 USD)	24.6	24.0	25.6	34.6	39.5	40.2	41.3	68%
GDP PPP (billion 2010 USD)	54.8	53.7	57.2	77.3	88.1	89.7	92.3	68%
Population (millions)	10.1	10.3	8.1	7.4	7.3	7.1	7.1	-30%
CO ₂ / TPES (tCO ₂ per TJ)	75	77.1	74.7	73.6	70.1	72.0	71.1	-5%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	2.52	1.9	1.7	1.4	1.2	1.1	1.1	-56%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	1.13	0.8	0.8	0.6	0.5	0.5	0.5	-56%
CO ₂ / population (tCO ₂ per capita)	6.2	4.3	5.3	6.7	6.3	6.3	6.4	5%
Share of electricity output from fossil fuels	77%	65%	65%	67%	68%	73%	72%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	908	1020	902	778	721	756	729	-20%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ²								
CO ₂ emissions index	100	72	69	80	74	72	73	-27%
Population index	100	102	81	74	73	71	70	-30%
GDP PPP per population index	100	96	129	190	222	232	240	140%
Energy intensity index - TPES / GDP PPP	100	71	67	58	49	46	46	-54%
Carbon intensity index - CO ₂ / TPES	100	103	100	98	93	96	95	-5%

1. Data for Serbia include Montenegro until 2004 and Kosovo until 1999. 2. Please see Part I for methodological notes.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ³	Total	%change 90-16
CO₂ fuel combustion	32.9	9.0	3.6	0.0	45.5	-27%
Electricity and heat generation	29.3	0.7	1.4	0.0	31.5	-22%
Other energy industry own use	-	0.3	0.3	-	0.7	x
Manufacturing industries and construction	2.4	1.1	1.0	-	4.5	-54%
Transport	-	6.0	0.0	-	6.0	34%
<i>of which: road</i>	-	5.9	0.0	-	5.9	32%
Other	1.2	0.8	0.8	-	2.8	-61%
<i>of which: residential</i>	0.9	0.2	0.4	-	1.5	-30%
<i>of which: services</i>	0.3	0.2	0.4	-	0.9	x
<i>Memo: international marine bunkers</i>	-	0.1	-	-	0.1	x
<i>Memo: international aviation bunkers</i>	-	0.4	-	-	0.4	-18%

3. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ⁴ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	28.0	38.2	..	..
Road - oil	5.9	4.5	..	..
Manufacturing industries - coal	2.4	1.6	..	..
Unallocated autoproducers - coal	1.3	-	..	..
Main activity prod. elec. and heat - gas	1.1	0.5	..	..
Manufacturing industries - oil	1.1	6.4	..	..
Manufacturing industries - gas	1.0	1.8	..	..
Residential - coal	0.9	1.9	..	..
Non-specified other - oil	0.6	1.0	..	..
<i>Memo: total CO₂ from fuel combustion</i>	<i>45.5</i>	<i>61.9</i>	<i>..</i>	<i>..</i>

4. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Singapore

Figure 1. CO₂ emissions by fuel

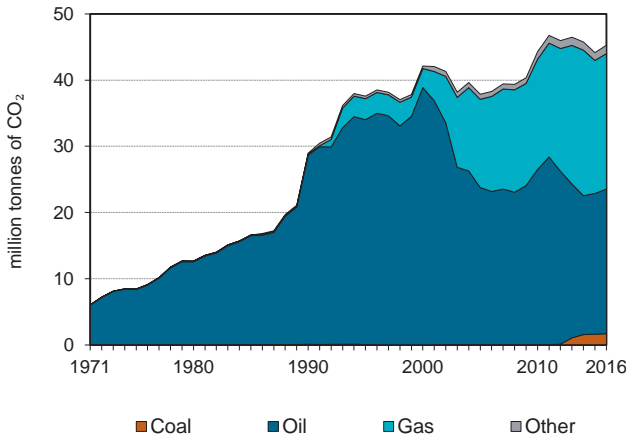


Figure 2. CO₂ emissions by sector

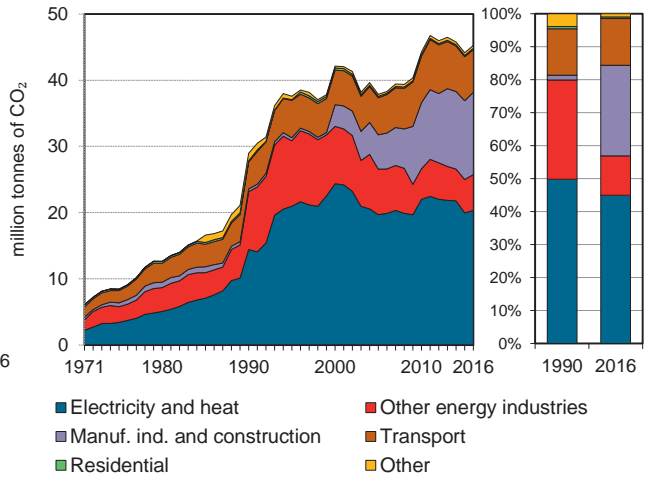


Figure 3. Electricity generation by fuel

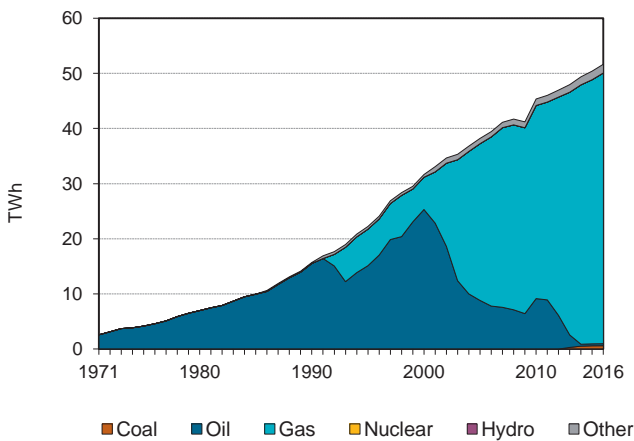


Figure 4. CO₂ from electricity generation: driving factors¹

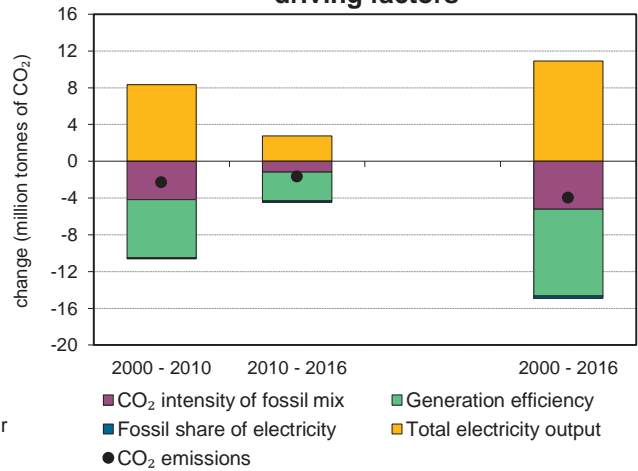


Figure 5. Changes in selected indicators

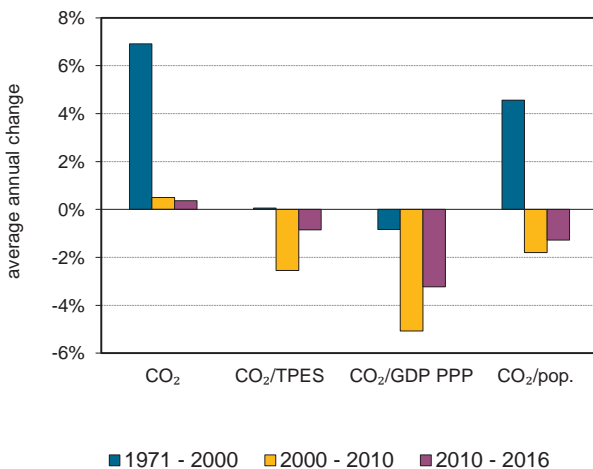
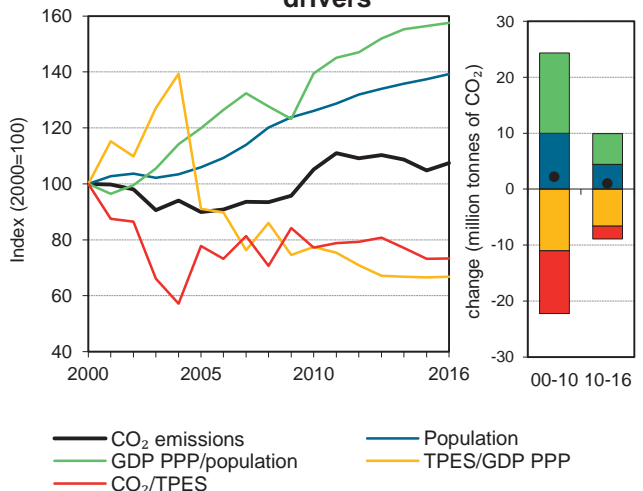


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Singapore

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	29	37.6	42.1	37.9	44.3	44.2	45.3	56%
Share of World CO ₂ from fuel combustion	0.1%	0.2%	0.2%	0.1%	0.2%	0.1%	0.1%	
TPES (PJ)	483	789	782	903	1 064	1 119	1 145	137%
GDP (billion 2010 USD)	67.6	102.2	134.5	170.7	236.4	289.2	294.9	336%
GDP PPP (billion 2010 USD)	102.5	155.1	204.0	259.0	358.7	438.7	447.4	336%
Population (millions)	3.1	3.5	4.0	4.3	5.1	5.5	5.6	84%
CO ₂ / TPES (tCO ₂ per TJ)	60	47.6	53.9	41.9	41.6	39.5	39.5	-34%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.43	0.4	0.3	0.2	0.2	0.2	0.2	-64%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.28	0.2	0.2	0.1	0.1	0.1	0.1	-64%
CO ₂ / population (tCO ₂ per capita)	9.5	10.7	10.5	8.9	8.7	8.0	8.1	-15%
Share of electricity output from fossil fuels	100%	99%	99%	99%	99%	98%	98%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	918	943	769	515	485	396	394	-57%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	130	145	131	153	152	156	56%
Population index	100	116	132	140	167	182	184	84%
GDP PPP per population index	100	131	151	180	210	236	237	137%
Energy intensity index - TPES / GDP PPP	100	108	81	74	63	54	54	-46%
Carbon intensity index - CO ₂ / TPES	100	79	90	70	69	66	66	-34%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	1.7	21.8	20.5	1.3	45.3	56%
Electricity and heat generation	1.0	0.4	17.7	1.3	20.3	41%
Other energy industry own use	-	5.4	0.0	-	5.4	-38%
Manufacturing industries and construction	0.7	9.4	2.4	-	12.4	+
Transport	-	6.4	0.0	-	6.5	59%
<i>of which: road</i>	-	6.3	0.0	-	6.3	56%
Other	-	0.3	0.4	-	0.6	-52%
<i>of which: residential</i>	-	0.1	0.1	-	0.2	9%
<i>of which: services</i>	-	0.2	0.2	-	0.4	-59%
<i>Memo: international marine bunkers</i>	-	151.5	-	-	151.5	343%
<i>Memo: international aviation bunkers</i>	-	23.4	-	-	23.4	311%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - gas	15.6	-	26.3	26.3
Manufacturing industries - oil	9.4	0.3	15.8	42.1
Road - oil	6.3	4.1	10.6	52.7
Other energy industry own use - oil	5.4	8.7	9.1	61.7
Manufacturing industries - gas	2.4	-	4.0	65.7
Unallocated autoproducers - gas	2.1	-	3.5	69.3
Main activity prod. elec. and heat - other	1.3	0.1	2.1	71.4
Main activity prod. elec. and heat - coal	1.0	0.0	1.7	73.1
Manufacturing industries - coal	0.7	0.1	1.1	74.2
<i>Memo: total CO₂ from fuel combustion</i>	45.3	29	76.2	76.2

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Slovak Republic

Figure 1. CO₂ emissions by fuel

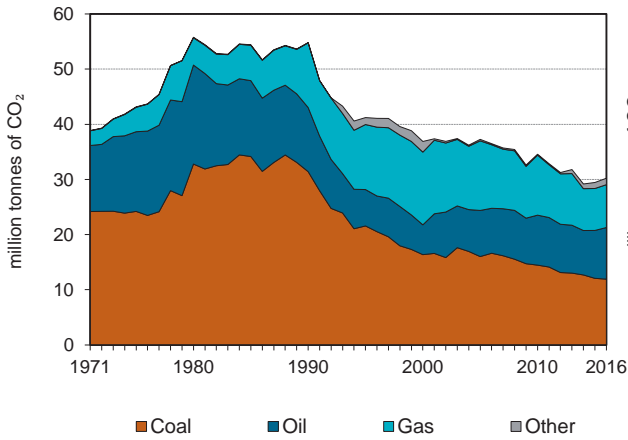


Figure 2. CO₂ emissions by sector

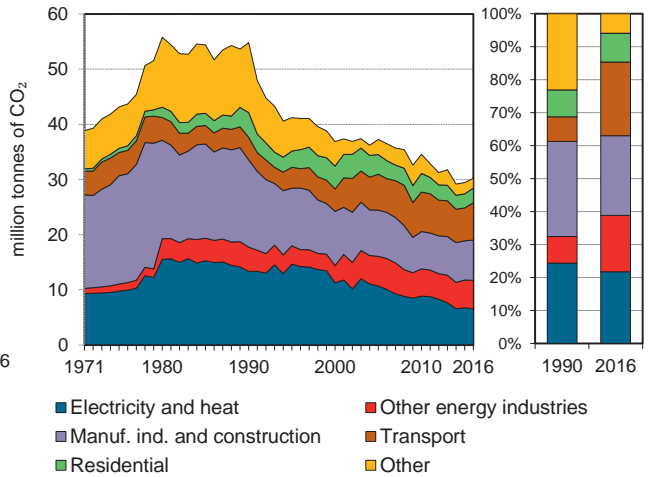


Figure 3. Electricity generation by fuel

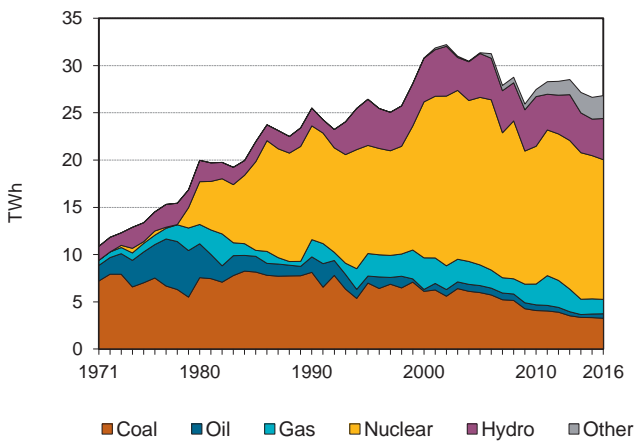


Figure 4. CO₂ from electricity generation: driving factors¹

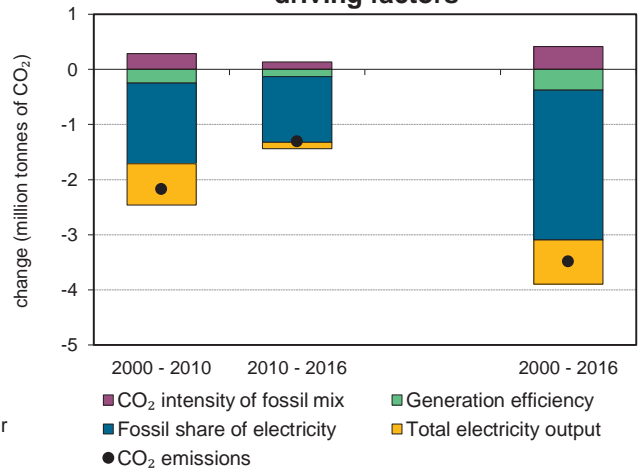


Figure 5. Changes in selected indicators

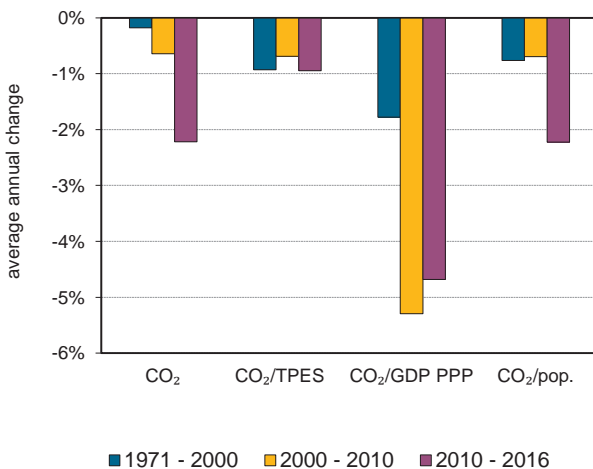
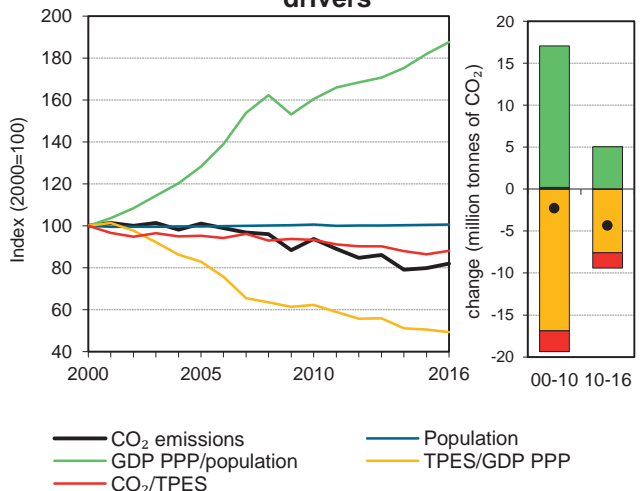


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Slovak Republic

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	54.8	41.2	36.9	37.3	34.6	29.4	30.2	-45%
Share of World CO ₂ from fuel combustion	0.3%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	
TPES (PJ)	893	744	743	788	746	686	691	-23%
GDP (billion 2010 USD)	51.1	46.6	55.5	71.0	89.5	101.3	104.7	105%
GDP PPP (billion 2010 USD)	77	70.3	83.6	106.9	134.8	152.6	157.7	105%
Population (millions)	5.3	5.4	5.4	5.4	5.4	5.4	5.4	3%
CO ₂ / TPES (tCO ₂ per TJ)	61.4	55.4	49.6	47.3	46.3	42.9	43.7	-29%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.07	0.9	0.7	0.5	0.4	0.3	0.3	-73%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.71	0.6	0.4	0.3	0.3	0.2	0.2	-73%
CO ₂ / population (tCO ₂ per capita)	10.4	7.7	6.8	6.9	6.4	5.4	5.6	-46%
Share of electricity output from fossil fuels	45%	38%	32%	29%	25%	20%	20%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	397	370	250	225	201	169	158	-60%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	75	67	68	63	54	55	-45%
Population index	100	101	102	102	102	102	103	3%
GDP PPP per population index	100	90	107	137	171	194	200	100%
Energy intensity index - TPES / GDP PPP	100	91	77	64	48	39	38	-62%
Carbon intensity index - CO ₂ / TPES	100	90	81	77	75	70	71	-29%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	11.9	9.4	7.8	1.2	30.2	-45%
Electricity and heat generation	4.2	0.7	1.5	0.1	6.6	-51%
Other energy industry own use	3.4	1.5	0.2	-	5.2	17%
Manufacturing industries and construction	3.9	0.4	1.9	1.1	7.3	-54%
Transport	-	6.4	0.3	-	6.8	65%
<i>of which: road</i>	-	6.3	-	-	6.3	55%
Other	0.4	0.2	3.8	0.0	4.4	-74%
<i>of which: residential</i>	0.1	0.0	2.5	-	2.7	-41%
<i>of which: services</i>	0.2	0.0	1.3	0.0	1.5	-86%
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.1	-	-	0.1	x

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	6.3	4.1	13.9	13.9
Manufacturing industries - coal	3.9	8.4	8.6	22.6
Main activity prod. elec. and heat - coal	3.6	8.3	8.0	30.5
Other energy industry - coal	3.4	3.7	7.5	38.0
Residential - gas	2.5	2.6	5.5	43.6
Manufacturing industries - gas	1.9	3.1	4.1	47.7
Other energy industry own use - oil	1.5	0.4	3.3	51.0
Main activity prod. elec. and heat - gas	1.3	2.1	2.9	53.9
Non-specified other - gas	1.3	3.5	2.9	56.8
<i>Memo: total CO₂ from fuel combustion</i>	30.2	54.8	66.6	66.6

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Slovenia¹

Figure 1. CO₂ emissions by fuel

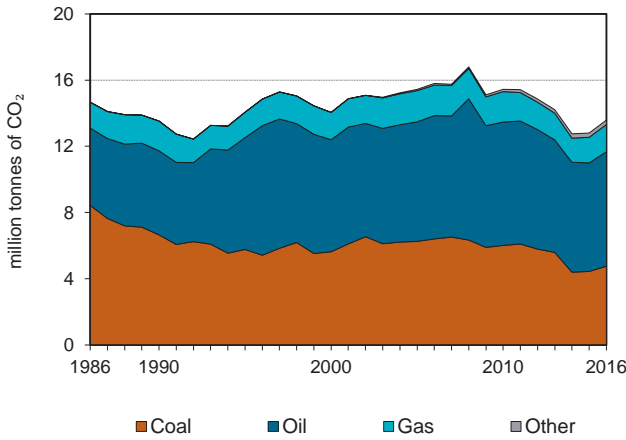


Figure 2. CO₂ emissions by sector

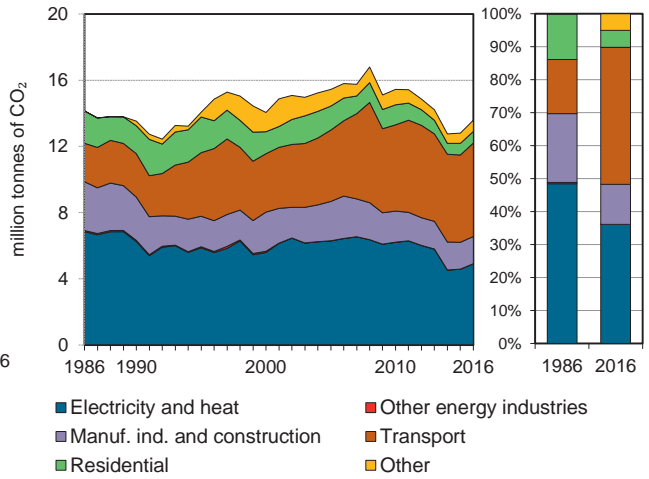


Figure 3. Electricity generation by fuel

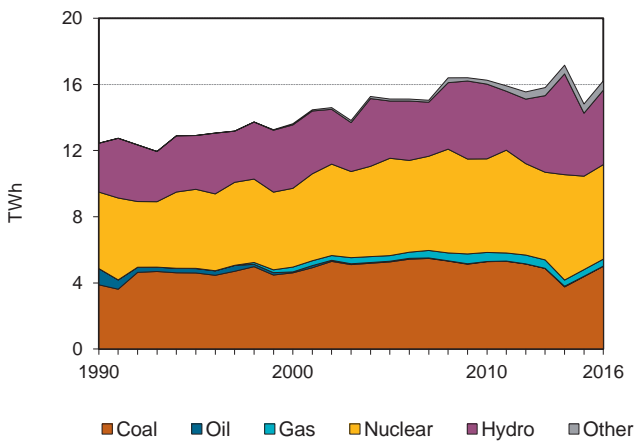


Figure 4. CO₂ from electricity generation: driving factors²

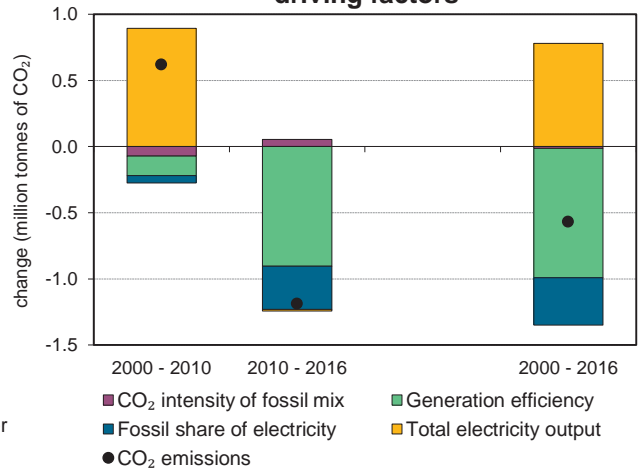


Figure 5. Changes in selected indicators

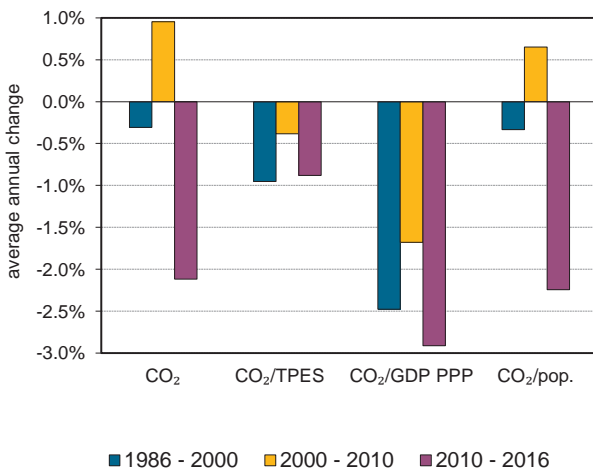
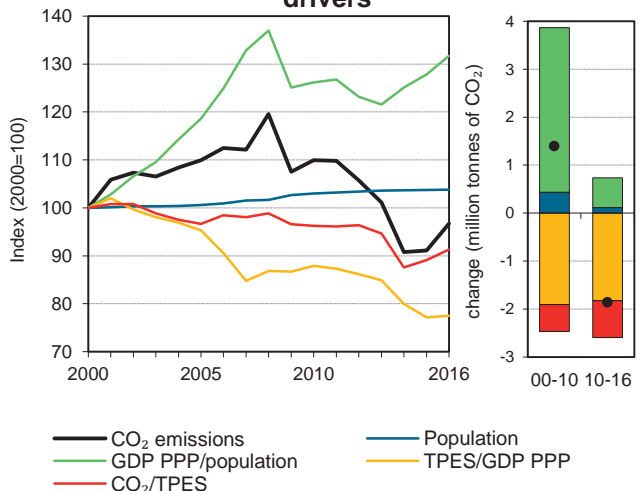


Figure 6. Total CO₂ emissions and drivers³



1. Under the Convention Slovenia is allowed to use 1986 as its base year.

2. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.

3. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Slovenia ¹

Key indicators

	1986	1990	1995	2005	2010	2015	2016	%change 86-16
CO ₂ fuel combustion (MtCO ₂)	14.7e	13.5	14.1	15.4	15.4	12.8	13.6	-7%
Share of World CO ₂ from fuel combustion	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	
TPES (PJ)	245e	239	254	305	307	275	284	16%
GDP (billion 2010 USD)	29.6e	30.9	30.0	44.1	48.0	49.0	50.5	71%
GDP PPP (billion 2010 USD)	32.1e	36.6	35.5	52.3	56.9	58.1	59.9	86%
Population (millions)	2e	2.0	2.0	2.0	2.0	2.1	2.1	4%
CO ₂ / TPES (tCO ₂ per TJ)	59.8e	56.6	55.4	50.6	50.4	46.6	47.8	-20%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.5e	0.4	0.5	0.4	0.3	0.3	0.3	-46%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.46e	0.4	0.4	0.3	0.3	0.2	0.2	-50%
CO ₂ / population (tCO ₂ per capita)	7.4e	6.8	7.1	7.7	7.5	6.2	6.6	-11%
Share of electricity output from fossil fuels	0%	39%	38%	37%	36%	33%	34%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	0e	437	389	355	331	262	259	0%
CO₂ emissions and drivers - Kaya decomposition (1986=100) ²								
CO ₂ emissions index	100	92	96	105	105	87	93	-7%
Population index	100	101	100	101	103	104	104	4%
GDP PPP per population index	100	113	110	161	171	173	179	79%
Energy intensity index - TPES / GDP PPP	100	86	94	77	71	62	62	-38%
Carbon intensity index - CO ₂ / TPES	100	95	93	85	84	78	80	-20%

1. Under the Convention Slovenia is allowed to use 1986 as its base year. 2. Please see Part I for methodological notes.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ³	Total	%change 86-16
CO₂ fuel combustion	4.8	6.9	1.6	0.3	13.6	-7%
Electricity and heat generation	4.6	0.0	0.2	0.1	4.9	-28%
Other energy industry own use	-	-	0.0	-	0.0	-100%
Manufacturing industries and construction	0.2	0.3	1.0	0.2	1.6	-44%
Transport	-	5.6	0.0	-	5.6	143%
<i>of which: road</i>	-	5.6	0.0	-	5.6	145%
Other	-	1.0	0.4	-	1.4	-29%
<i>of which: residential</i>	-	0.4	0.3	-	0.7	-64%
<i>of which: services</i>	-	0.3	0.2	-	0.4	x
<i>Memo: international marine bunkers</i>	-	0.4	-	-	0.4	x
<i>Memo: international aviation bunkers</i>	-	0.1	-	-	0.1	-34%

3. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1986 CO ₂ emissions (MtCO ₂)	Share in total GHG ⁴ (%)	Cumulative total (%)
Road - oil	5.6	2.3	32.1	32.1
Main activity prod. elec. and heat - coal	4.6	5.8	26.2	58.3
Manufacturing industries - gas	1.0	1.1	5.6	63.9
Non-specified other - oil	0.5	-	3.0	66.9
Residential - oil	0.4	0.7	2.5	69.4
Manufacturing industries - oil	0.3	1.1	1.7	71.1
Residential - gas	0.3	0.0	1.5	72.7
Manufacturing industries -other	0.2	-	1.2	73.9
Main activity prod. elec. and heat - gas	0.2	0.0	1.2	75.1
<i>Memo: total CO₂ from fuel combustion</i>	13.6	14.7e	77.8	77.8

4. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

South Africa

Figure 1. CO₂ emissions by fuel

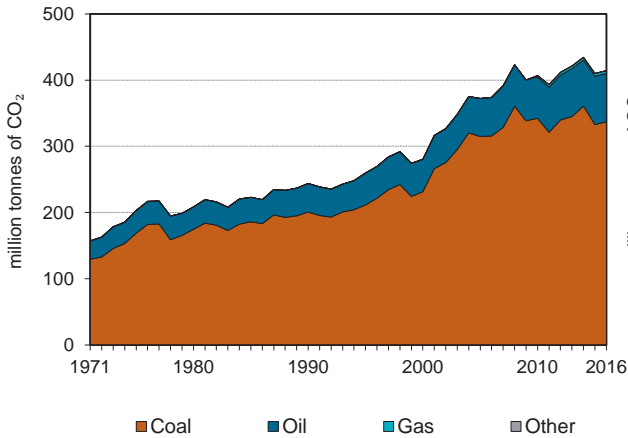


Figure 2. CO₂ emissions by sector

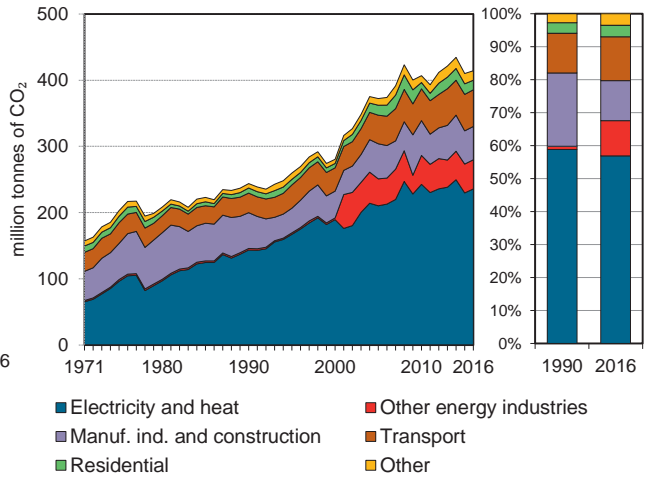


Figure 3. Electricity generation by fuel

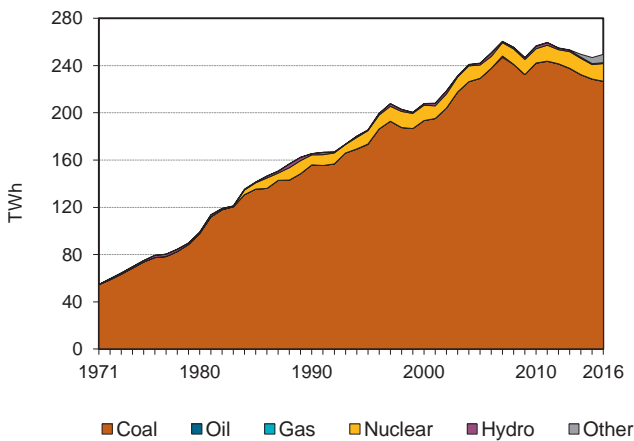


Figure 4. CO₂ from electricity generation: driving factors¹

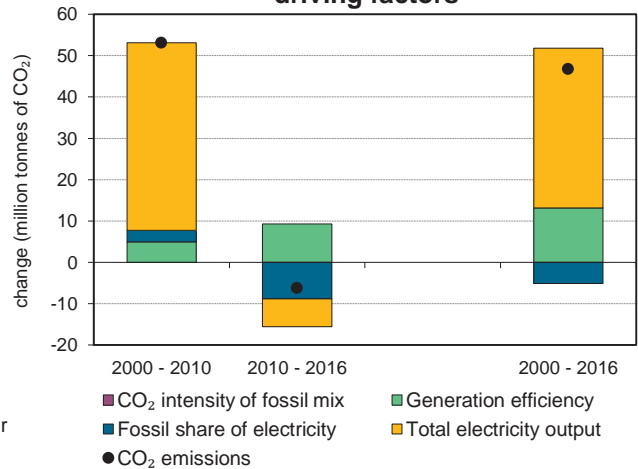


Figure 5. Changes in selected indicators

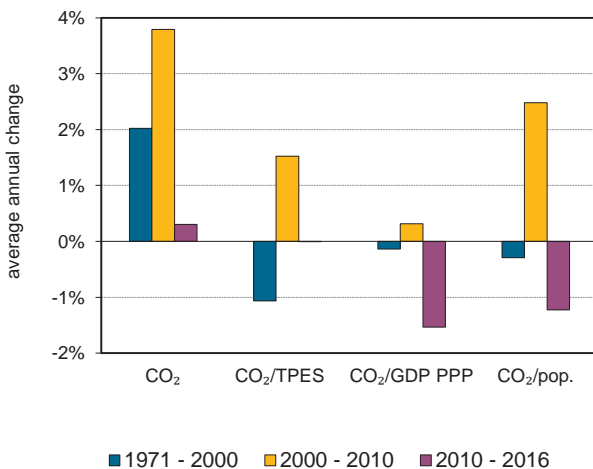
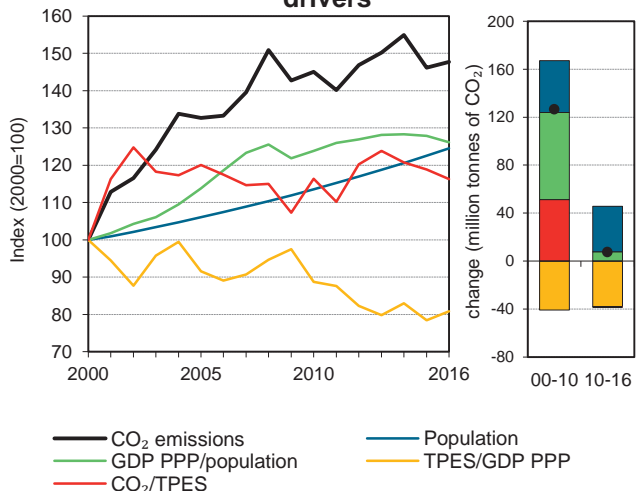


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

South Africa

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	243.8	259.8	280.5	372.3	406.9	410.1	414.4	70%
Share of World CO ₂ from fuel combustion	1.2%	1.2%	1.2%	1.4%	1.3%	1.3%	1.3%	
TPES (PJ)	3756	4 335	4 630	5 119	5 773	5 693	5 880	57%
GDP (billion 2010 USD)	222.9	232.7	267.0	322.2	375.3	418.4	419.6	88%
GDP PPP (billion 2010 USD)	356.8	372.5	427.4	515.8	600.8	669.7	671.6	88%
Population (millions)	36.8	41.4	44.9	47.6	51.0	55.0	55.9	52%
CO ₂ / TPES (tCO ₂ per TJ)	64.9	59.9	60.6	72.7	70.5	72.0	70.5	9%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.09	1.1	1.1	1.2	1.1	1.0	1.0	-10%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.68	0.7	0.7	0.7	0.7	0.6	0.6	-10%
CO ₂ / population (tCO ₂ per capita)	6.6	6.3	6.2	7.8	8.0	7.5	7.4	12%
Share of electricity output from fossil fuels	94%	94%	93%	95%	94%	93%	91%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	866	902	911	869	946	931	945	9%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	107	115	153	167	168	170	70%
Population index	100	113	122	129	139	150	152	52%
GDP PPP per population index	100	93	98	112	122	126	124	24%
Energy intensity index - TPES / GDP PPP	100	111	103	94	91	81	83	-17%
Carbon intensity index - CO ₂ / TPES	100	92	93	112	109	111	109	9%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	337.0	73.4	4.0	-	414.4	70%
Electricity and heat generation	235.6	0.1	-	-	235.8	64%
Other energy industry own use	41.5	2.6	-	-	44.1	+
Manufacturing industries and construction	39.3	7.0	4.0	-	50.3	-7%
Transport	-	55.4	0.0	-	55.4	88%
<i>of which: road</i>	-	51.5	0.0	-	51.5	82%
Other	20.6	8.2	0.0	-	28.8	100%
<i>of which: residential</i>	12.7	1.8	-	-	14.4	88%
<i>of which: services</i>	6.3	0.4	0.0	-	6.8	87%
<i>Memo: international marine bunkers</i>	-	11.0	-	-	11.0	82%
<i>Memo: international aviation bunkers</i>	-	2.8	-	-	2.8	157%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	223.7	134.7	39.6	39.6
Road - oil	51.5	28.2	9.1	48.8
Other energy industry - coal	41.5	0.0	7.3	56.1
Manufacturing industries - coal	39.3	47.4	7.0	63.1
Residential - coal	12.7	5.9	2.3	65.3
Unallocated autoproducers - coal	12.0	8.7	2.1	67.5
Non-specified other sectors - coal	7.9	3.7	1.4	68.9
Manufacturing industries - oil	7.0	6.7	1.2	70.1
Non-specified other - oil	6.4	2.9	1.1	71.2
<i>Memo: total CO₂ from fuel combustion</i>	<i>414.4</i>	<i>243.8</i>	<i>73.4</i>	<i>73.4</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

South Sudan ¹

Figure 1. CO₂ emissions by fuel

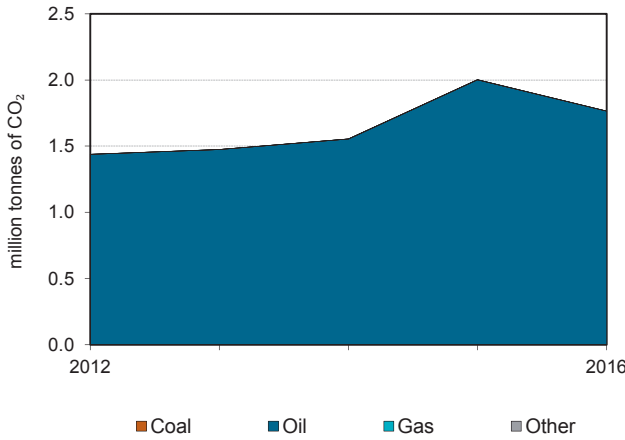


Figure 2. CO₂ emissions by sector

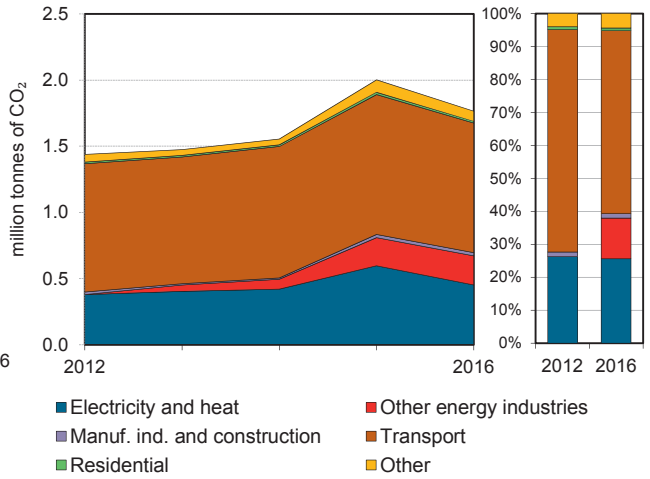


Figure 3. Electricity generation by fuel

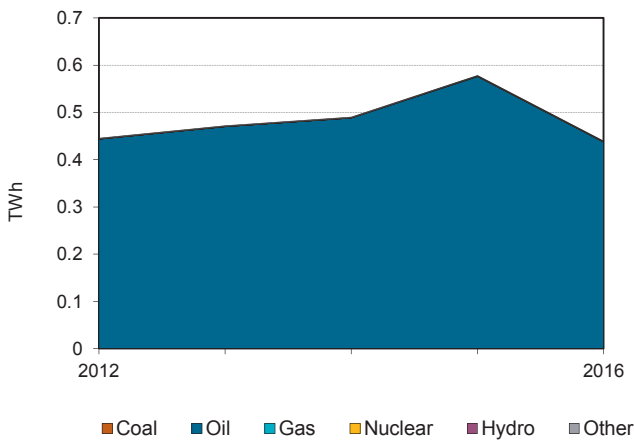


Figure 4. CO₂ from electricity generation: driving factors²

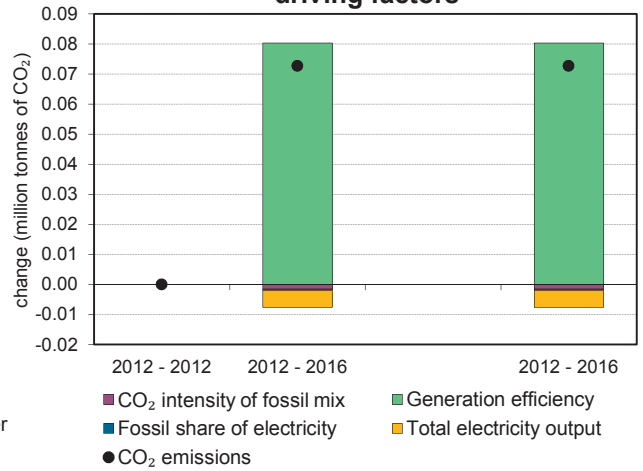


Figure 5. Changes in selected indicators

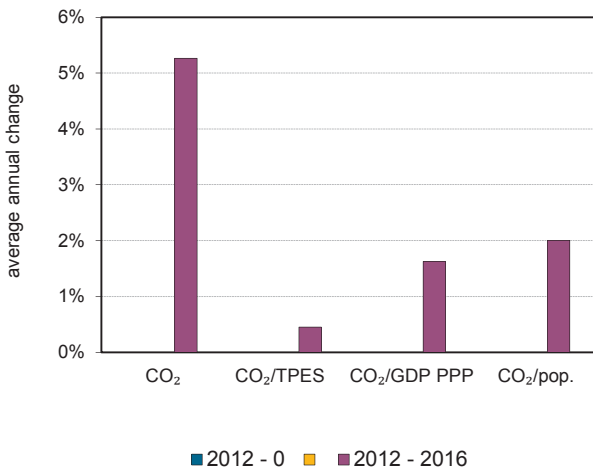
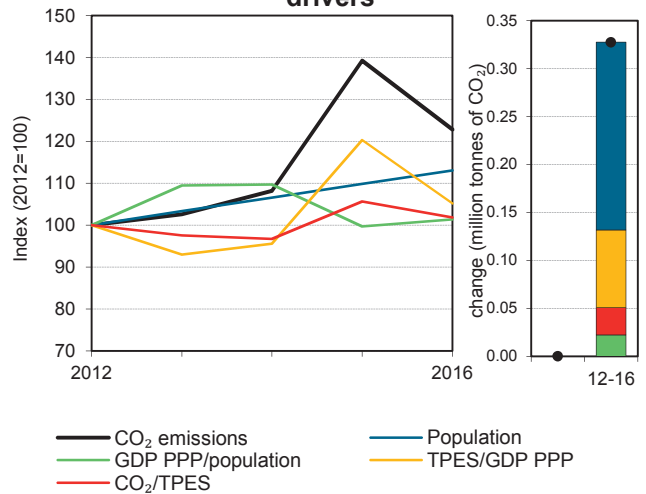


Figure 6. Total CO₂ emissions and drivers³



1. Prior to 2012, data for South Sudan were included in Sudan.

2. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.

3. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

South Sudan ¹

Key indicators

	1990	2000	2005	2010	2012	2015	2016	%change 12-16
CO ₂ fuel combustion (MtCO ₂)	1.4	2.0	1.8	23%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	
TPES (PJ)	27	36	33	21%
GDP (billion 2010 USD)	8.1	8.9	9.3	15%
GDP PPP (billion 2010 USD)	19.2	21.1	22.0	15%
Population (millions)	10.8	11.9	12.2	13%
CO ₂ / TPES (tCO ₂ per TJ)	53.3	56.3	54.3	2%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.2	0.2	0.2	7%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.1	0.1	0.1	7%
CO ₂ / population (tCO ₂ per capita)	0.1	0.2	0.1	8%
Share of electricity output from fossil fuels	100%	100%	100%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	851	1032	1030	21%
CO₂ emissions and drivers - Kaya decomposition (2012=100) ²								
CO ₂ emissions index	100	139	123	23%
Population index	100	110	113	13%
GDP PPP per population index	100	100	101	1%
Energy intensity index - TPES / GDP PPP	100	120	105	5%
Carbon intensity index - CO ₂ / TPES	100	106	102	2%

1. Prior to 2012, data for South Sudan were included in Sudan. 2. Please see the chapter *Indicator sources and methods* in Part I for methodological notes.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ³	Total	%change 12-16
CO₂ fuel combustion	-	1.8	-	-	1.8	23%
Electricity and heat generation	-	0.5	-	-	0.5	19%
Other energy industry own use	-	0.2	-	-	0.2	x
Manufacturing industries and construction	-	0.0	-	-	0.0	34%
Transport	-	1.0	-	-	1.0	1%
<i>of which: road</i>	-	0.9	-	-	0.9	-1%
Other	-	0.1	-	-	0.1	28%
<i>of which: residential</i>	-	0.0	-	-	0.0	-
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.2	-	-	0.2	97%

3. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ⁴ (%)	Cumulative total (%)
Road - oil	0.9	0.9	..	..
Unallocated autoproducers - oil	0.3	0.2	..	..
Other energy industry own use - oil	0.2	-	..	..
Main activity prod. elec. and heat - oil	0.2	0.2	..	..
Non-specified other - oil	0.1	0.1	..	..
Other transport - oil	0.0	0.0	..	..
Manufacturing industries - oil	0.0	0.0	..	..
Residential - oil	0.0	0.0	..	..
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	1.8	..	..	..

4. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Spain

Figure 1. CO₂ emissions by fuel

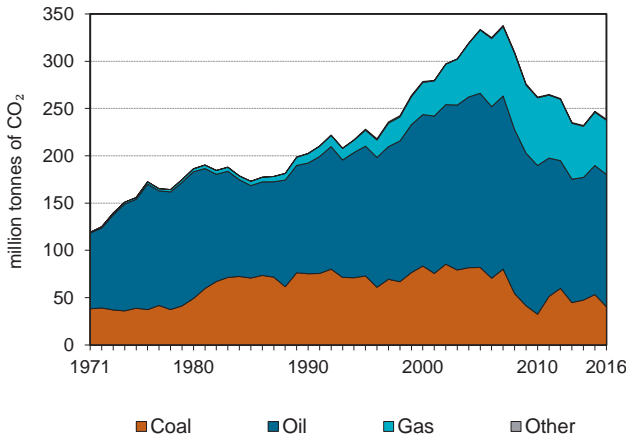


Figure 2. CO₂ emissions by sector

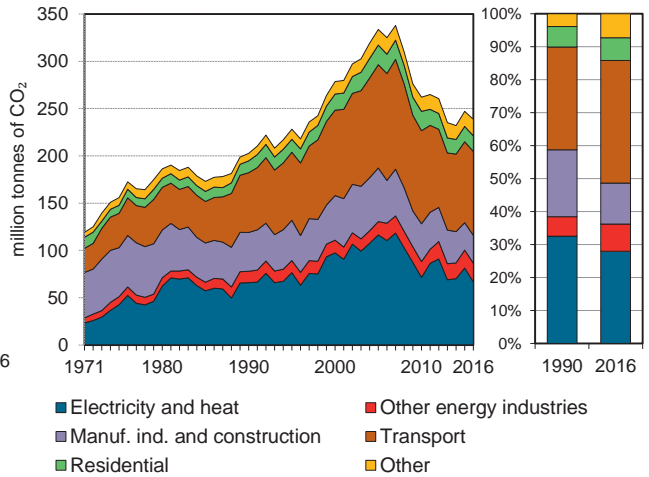


Figure 3. Electricity generation by fuel

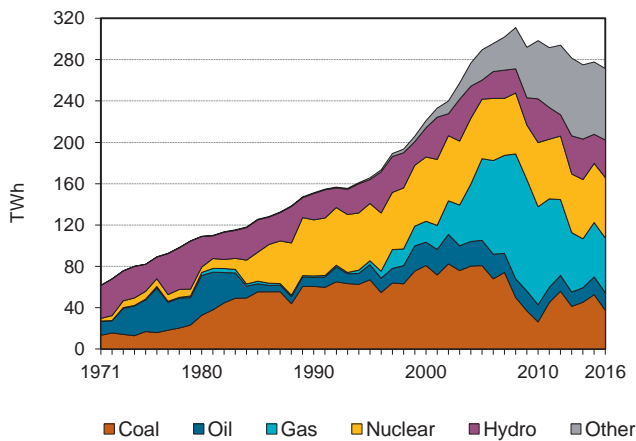


Figure 4. CO₂ from electricity generation: driving factors¹

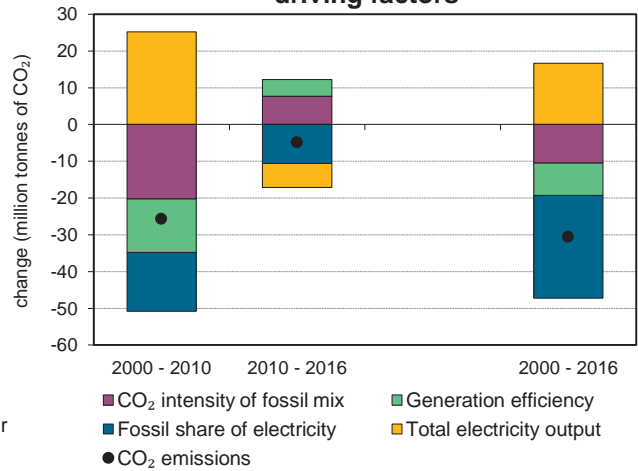


Figure 5. Changes in selected indicators

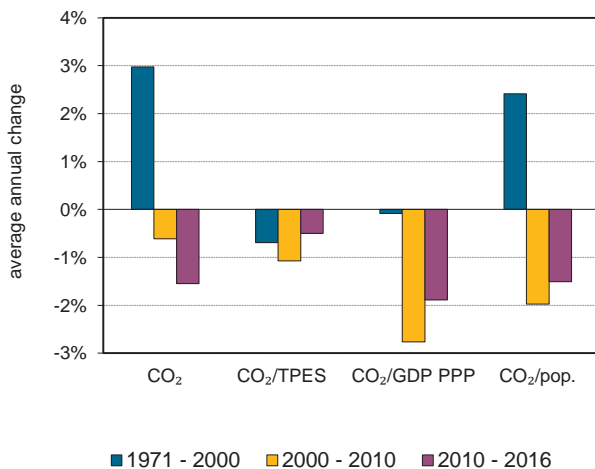
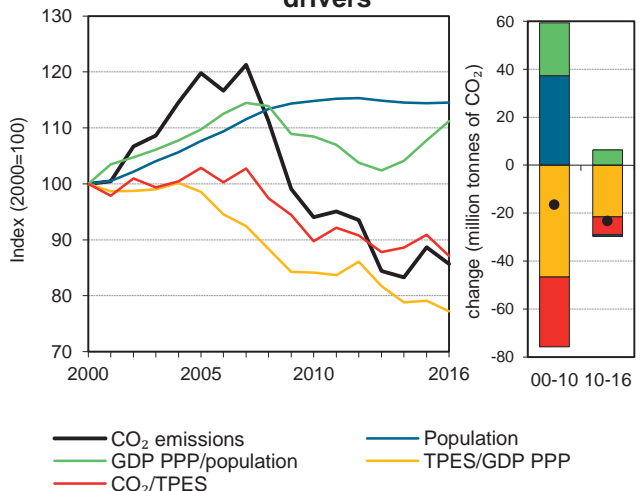


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Spain

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	202.6	228.2	278.6	333.7	262.1	247.1	238.6	18%
Share of World CO ₂ from fuel combustion	1.0%	1.1%	1.2%	1.2%	0.9%	0.8%	0.7%	
TPES (PJ)	3771	4 220	5 102	5 943	5 346	4 978	5 018	33%
GDP (billion 2010 USD)	873.1	940.9	1 149.5	1 358.1	1 431.6	1 418.1	1 464.5	68%
GDP PPP (billion 2010 USD)	908.6	979.1	1 196.2	1 413.2	1 489.8	1 475.7	1 524.0	68%
Population (millions)	39.3	39.7	40.6	43.7	46.6	46.4	46.5	18%
CO ₂ / TPES (tCO ₂ per TJ)	53.7	54.1	54.6	56.2	49.0	49.6	47.6	-11%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.23	0.2	0.2	0.2	0.2	0.2	0.2	-30%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.22	0.2	0.2	0.2	0.2	0.2	0.2	-30%
CO ₂ / population (tCO ₂ per capita)	5.2	5.7	6.9	7.6	5.6	5.3	5.1	0%
Share of electricity output from fossil fuels	47%	52%	56%	64%	46%	44%	40%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	436	462	441	402	240	293	246	-44%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	113	137	165	129	122	118	18%
Population index	100	101	103	111	118	118	118	18%
GDP PPP per population index	100	107	128	140	139	138	142	42%
Energy intensity index - TPES / GDP PPP	100	104	103	101	86	81	79	-21%
Carbon intensity index - CO ₂ / TPES	100	101	102	105	91	92	89	-11%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	40.4	139.8	57.5	0.9	238.6	18%
Electricity and heat generation	35.4	11.4	19.0	0.9	66.7	1%
Other energy industry own use	0.3	12.6	6.9	-	19.8	64%
Manufacturing industries and construction	4.2	9.9	15.3	-	29.5	-28%
Transport	-	88.0	0.8	-	88.8	40%
<i>of which: road</i>	-	79.7	0.7	-	80.4	51%
Other	0.5	18.0	15.4	0.0	33.9	66%
<i>of which: residential</i>	0.3	8.0	8.2	-	16.5	32%
<i>of which: services</i>	0.0	3.8	7.1	0.0	10.9	194%
<i>Memo: international marine bunkers</i>	-	23.9	-	-	23.9	107%
<i>Memo: international aviation bunkers</i>	-	12.2	-	-	12.2	265%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	79.7	53.3	24.6	24.6
Main activity prod. elec. and heat - coal	35.1	57.4	10.8	35.4
Manufacturing industries - gas	15.3	8.0	4.7	40.2
Other energy industry own use - oil	12.6	10.1	3.9	44.1
Main activity prod. elec. and heat - gas	11.6	0.4	3.6	47.6
Non-specified other - oil	10.0	7.4	3.1	50.7
Manufacturing industries - oil	9.9	19.5	3.1	53.8
Main activity prod. elec. and heat - oil	9.6	6.0	3.0	56.7
Other transport - oil	8.3	9.9	2.6	59.3
<i>Memo: total CO₂ from fuel combustion</i>	<i>238.6</i>	<i>202.6</i>	<i>73.7</i>	<i>73.7</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Sri Lanka

Figure 1. CO₂ emissions by fuel

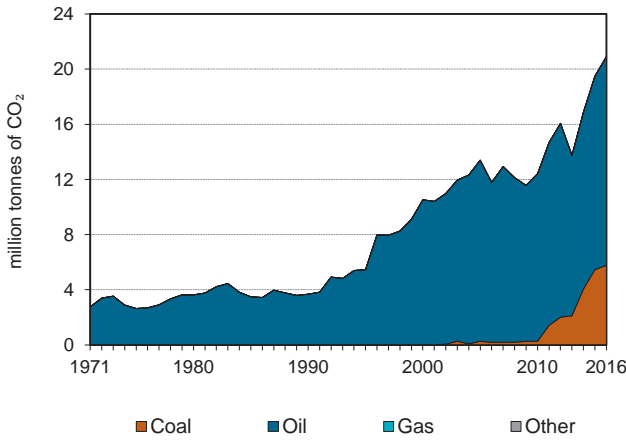


Figure 2. CO₂ emissions by sector

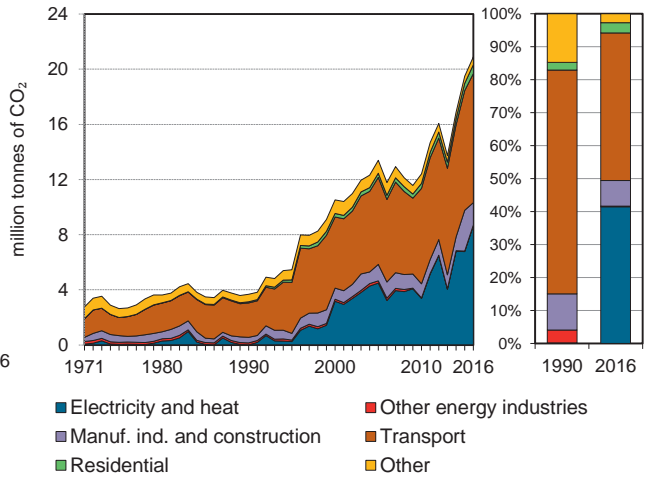


Figure 3. Electricity generation by fuel

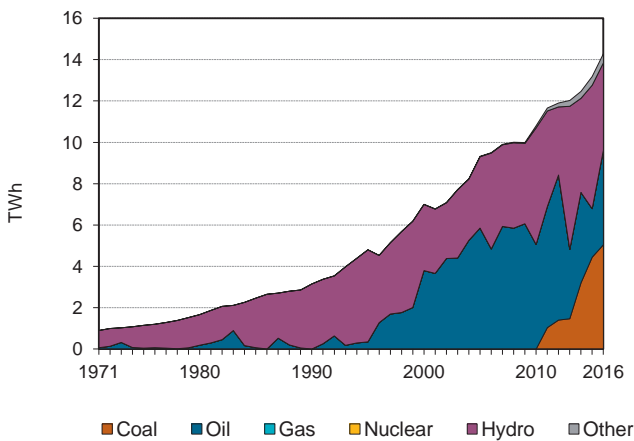


Figure 4. CO₂ from electricity generation: driving factors¹

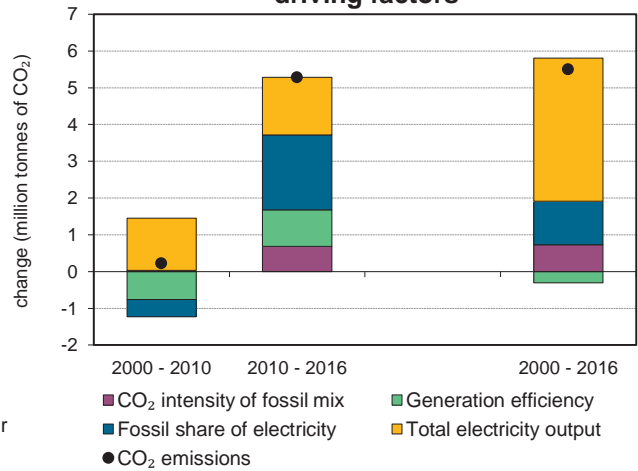


Figure 5. Changes in selected indicators

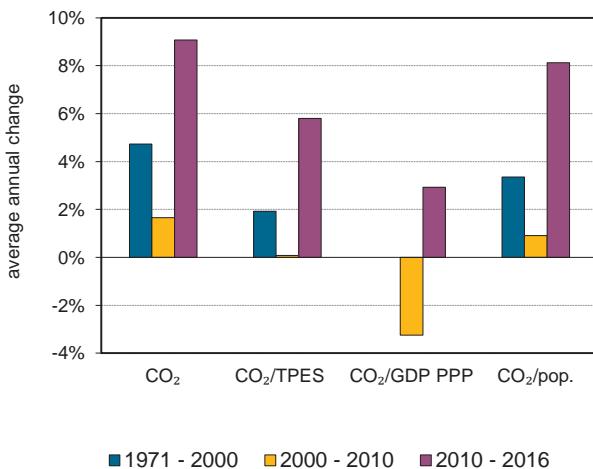
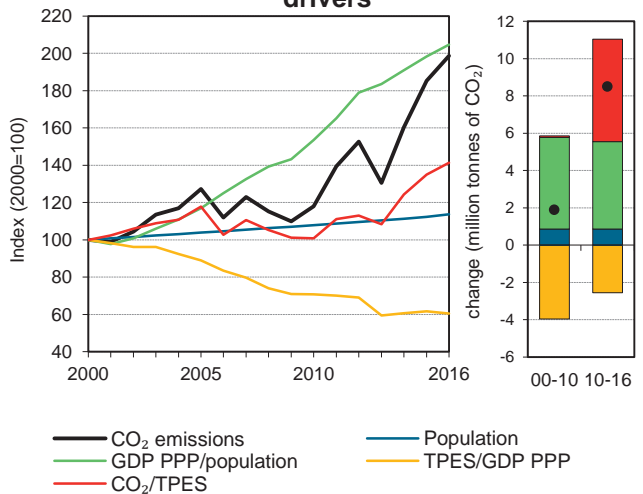


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Sri Lanka

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	3.7	5.5	10.5	13.4	12.4	19.5	20.9	468%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.1%	0.1%	0.0%	0.1%	0.1%	
TPES (PJ)	231	251	349	377	408	479	490	112%
GDP (billion 2010 USD)	20.6	26.8	34.3	41.6	56.7	76.4	79.7	287%
GDP PPP (billion 2010 USD)	61.3	79.8	102.0	123.9	168.8	227.2	237.2	287%
Population (millions)	17.1	18.1	18.7	19.4	20.1	21.0	21.2	24%
CO ₂ / TPES (tCO ₂ per TJ)	15.9	21.7	30.2	35.5	30.4	40.7	42.7	168%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.18	0.2	0.3	0.3	0.2	0.3	0.3	47%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.06	0.1	0.1	0.1	0.1	0.1	0.1	47%
CO ₂ / population (tCO ₂ per capita)	0.2	0.3	0.6	0.7	0.6	0.9	1.0	359%
Share of electricity output from fossil fuels	0%	7%	54%	63%	47%	52%	67%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	2	51	450	481	312	514	607	30624%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	148	286	364	338	530	568	468%
Population index	100	106	109	113	118	123	124	24%
GDP PPP per population index	100	123	152	178	234	302	311	211%
Energy intensity index - TPES / GDP PPP	100	84	91	81	64	56	55	-45%
Carbon intensity index - CO ₂ / TPES	100	136	190	223	191	256	268	168%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	5.8	15.1	-	-	20.9	468%
Electricity and heat generation	5.6	3.1	-	-	8.7	+
Other energy industry own use	-	0.0	-	-	0.0	-73%
Manufacturing industries and construction	0.2	1.4	-	-	1.6	302%
Transport	-	9.4	-	-	9.4	275%
<i>of which: road</i>	-	9.0	-	-	9.0	305%
Other	-	1.2	-	-	1.2	93%
<i>of which: residential</i>	-	0.6	-	-	0.6	667%
<i>of which: services</i>	-	0.2	-	-	0.2	776%
<i>Memo: international marine bunkers</i>	-	1.9	-	-	1.9	58%
<i>Memo: international aviation bunkers</i>	-	1.6	-	-	1.6	x

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	9.0	2.2	23.5	23.5
Main activity prod. elec. and heat - coal	5.6	-	14.5	38.0
Main activity prod. elec. and heat - oil	3.1	0.0	8.1	46.1
Manufacturing industries - oil	1.4	0.4	3.7	49.7
Residential - oil	0.6	0.1	1.7	51.4
Non-specified other - oil	0.6	0.5	1.5	52.9
Other transport - oil	0.3	0.3	0.9	53.8
Manufacturing industries - coal	0.2	0.0	0.6	54.3
Other energy industry own use - oil	0.0	0.1	0.1	54.4
<i>Memo: total CO₂ from fuel combustion</i>	<i>20.9</i>	<i>3.7</i>	<i>54.4</i>	<i>54.4</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Sudan¹

Figure 1. CO₂ emissions by fuel

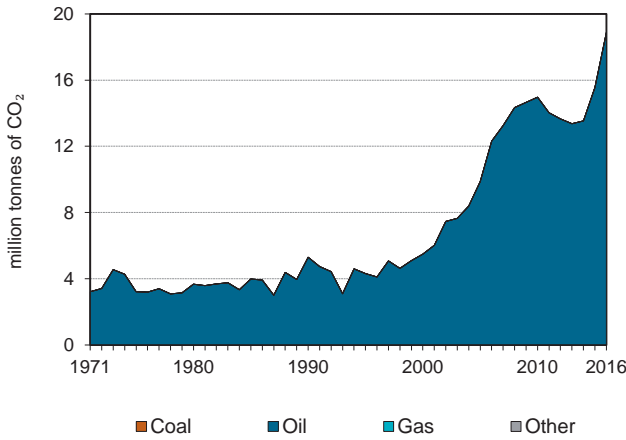


Figure 2. CO₂ emissions by sector

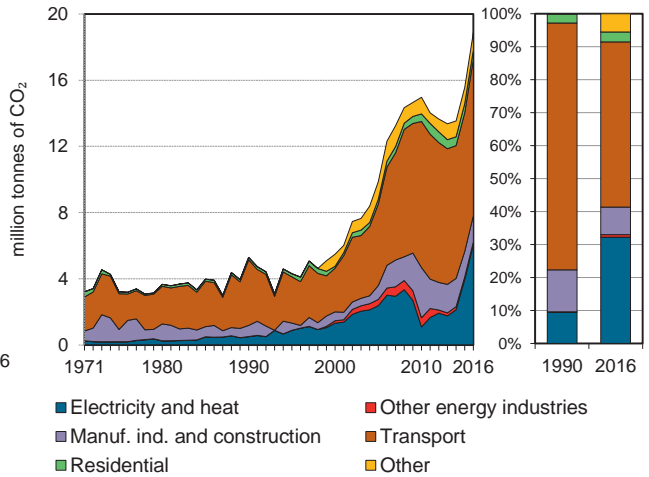


Figure 3. Electricity generation by fuel

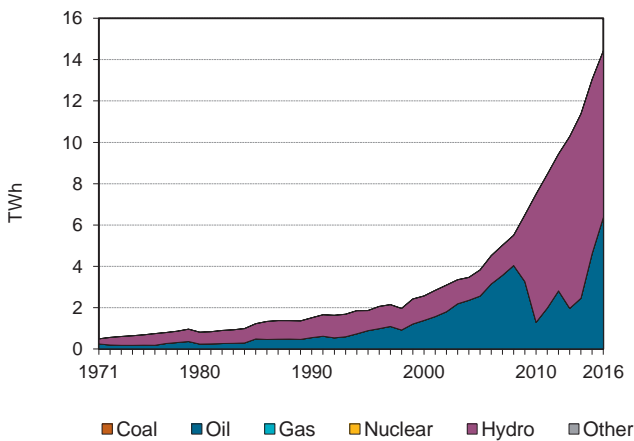


Figure 4. CO₂ from electricity generation: driving factors²

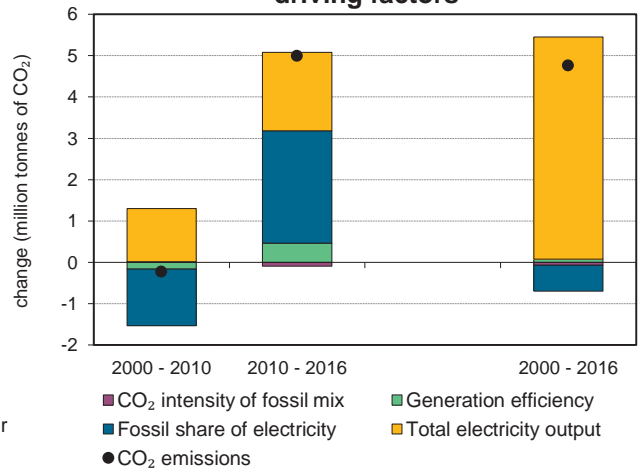


Figure 5. Changes in selected indicators

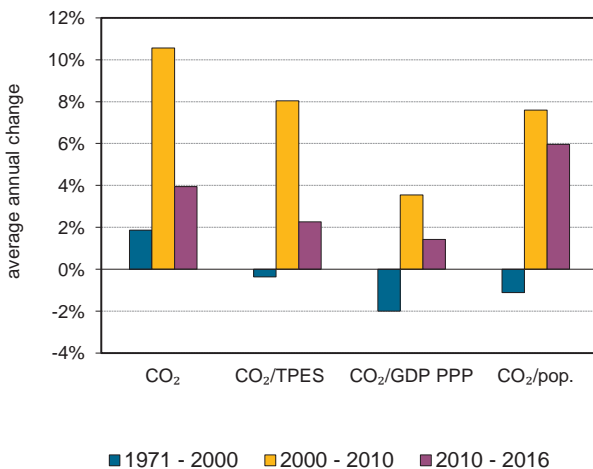
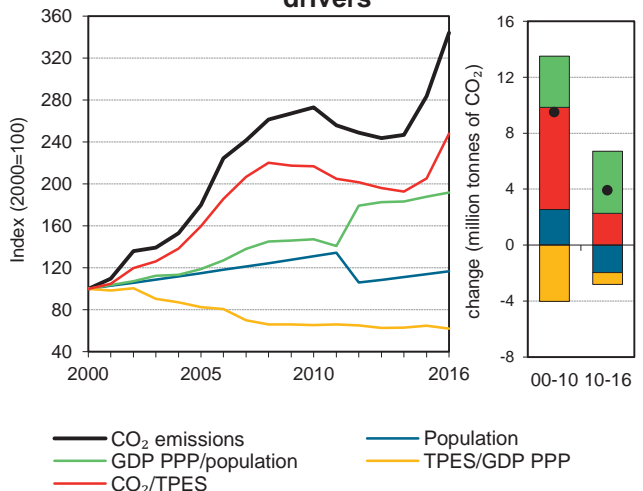


Figure 6. Total CO₂ emissions and drivers³



1. Data for Sudan include South Sudan until 2011.

2. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.

3. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Sudan ¹

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	5.3	4.3	5.5	9.9	15.0	15.6	18.9	256%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	
TPES (PJ)	445	502	557	627	702	770	774	74%
GDP (billion 2010 USD)	19.8	25.4	34.1	46.4	65.6	72.7	76.1	284%
GDP PPP (billion 2010 USD)	44.3	56.8	76.1	103.7	146.6	162.5	170.1	284%
Population (millions)	25.9	29.6	34.0	39.0	44.5	38.6	39.6	53%
CO ₂ / TPES (tCO ₂ per TJ)	11.9	8.6	9.8	15.7	21.3	20.2	24.4	105%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.27	0.2	0.2	0.2	0.2	0.2	0.2	-7%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.12	0.1	0.1	0.1	0.1	0.1	0.1	-8%
CO ₂ / population (tCO ₂ per capita)	0.2	0.1	0.2	0.3	0.3	0.4	0.5	134%
Share of electricity output from fossil fuels	37%	48%	54%	67%	17%	36%	44%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	329	470	514	621	145	303	421	28%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ²								
CO ₂ emissions index	100	81	104	186	283	294	356	256%
Population index	100	114	131	151	172	149	153	53%
GDP PPP per population index	100	112	131	156	193	246	252	152%
Energy intensity index - TPES / GDP PPP	100	88	73	60	48	47	45	-55%
Carbon intensity index - CO ₂ / TPES	100	72	83	132	179	170	205	105%

1. Data for Sudan include South Sudan until 2011. 2. Please see the chapter *Indicator sources and methods* in Part I for methodological notes.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ³	Total	%change 90-16
CO₂ fuel combustion	-	18.9	-	-	18.9	256%
Electricity and heat generation	-	6.1	-	-	6.1	+
Other energy industry own use	-	0.2	-	-	0.2	+
Manufacturing industries and construction	-	1.6	-	-	1.6	134%
Transport	-	9.5	-	-	9.5	139%
<i>of which: road</i>	-	9.4	-	-	9.4	137%
Other	-	1.6	-	-	1.6	982%
<i>of which: residential</i>	-	0.6	-	-	0.6	293%
<i>of which: services</i>	-	0.4	-	-	0.4	x
<i>Memo: international marine bunkers</i>	-	0.1	-	-	0.1	229%
<i>Memo: international aviation bunkers</i>	-	0.9	-	-	0.9	841%

3. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ⁴ (%)	Cumulative total (%)
Road - oil	9.4	4.0	5.7	5.7
Main activity prod. elec. and heat - oil	6.1	0.5	3.7	9.4
Manufacturing industries - oil	1.6	0.7	1.0	10.4
Non-specified other - oil	1.1	0.0	0.6	11.0
Residential - oil	0.6	0.1	0.3	11.3
Other energy industry own use - oil	0.2	0.0	0.1	11.4
Other transport - oil	0.1	-	0.0	11.5
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	18.9	5.3	11.5	11.5

4. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Suriname ¹

Figure 1. CO₂ emissions by fuel

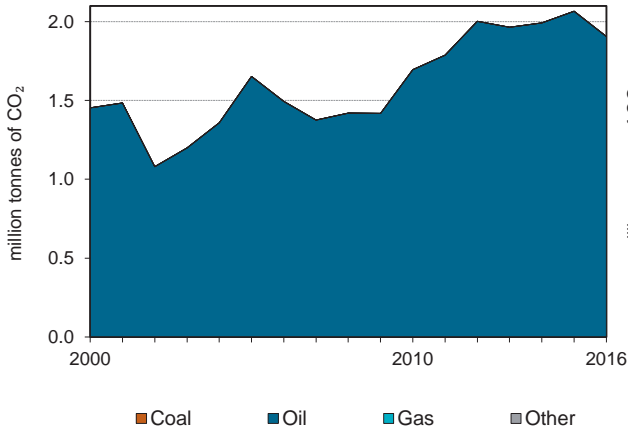


Figure 2. CO₂ emissions by sector

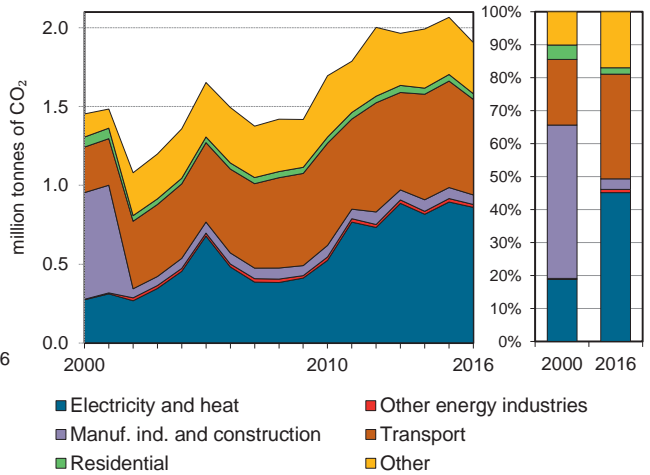


Figure 3. Electricity generation by fuel

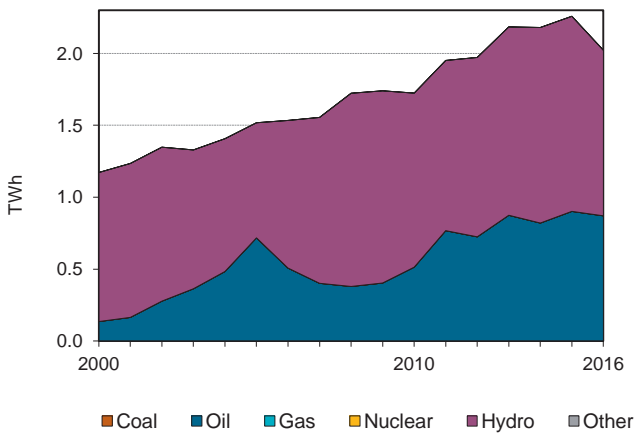


Figure 4. CO₂ from electricity generation: driving factors²

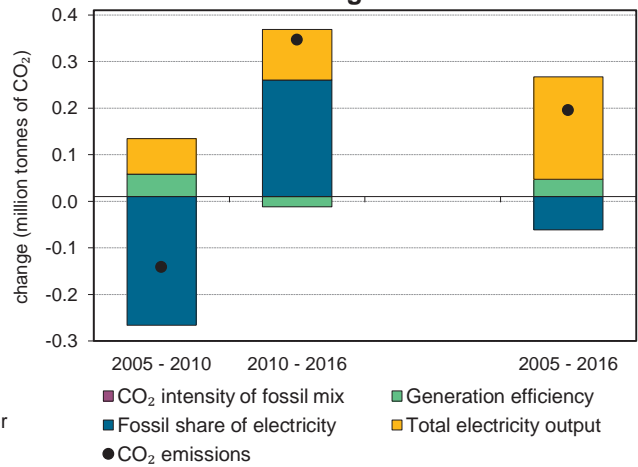


Figure 5. Changes in selected indicators

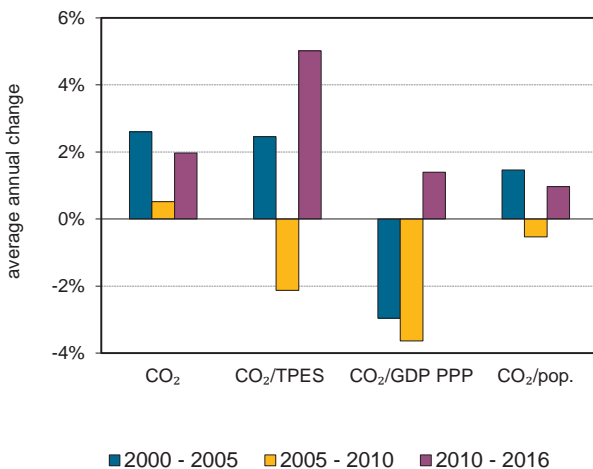
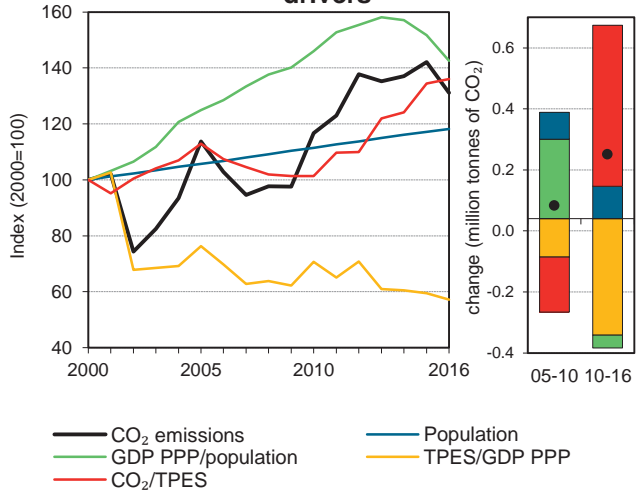


Figure 6. Total CO₂ emissions and drivers³



1. Prior to 2000, data for Suriname were included in Other non-OECD Americas.

2. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.

3. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Suriname ¹

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 00-16
CO ₂ fuel combustion (MtCO ₂)	1.5	1.7	1.7	2.1	1.9	..
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	..
TPES (PJ)	26	26	29	27	25	..
GDP (billion 2010 USD)	2.7	3.5	4.4	4.8	4.3	..
GDP PPP (billion 2010 USD)	4.5	5.9	7.3	8.0	7.6	..
Population (millions)	0.5	0.5	0.5	0.6	0.6	..
CO ₂ / TPES (tCO ₂ per TJ)	56.9	64.3	57.7	76.5	77.4	..
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.5	0.5	0.4	0.4	0.4	..
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.3	0.3	0.2	0.3	0.3	..
CO ₂ / population (tCO ₂ per capita)	3.1	3.3	3.2	3.7	3.4	..
Share of electricity output from fossil fuels	12%	47%	30%	40%	43%	..
CO ₂ / kWh of electricity (gCO ₂ /kWh)	234	447	304	396	425	..
CO₂ emissions and drivers - Kaya decomposition (2000=100) ²								
CO ₂ emissions index	100	114	117	142	131	..
Population index	100	106	111	117	118	..
GDP PPP per population index	100	125	146	152	143	..
Energy intensity index - TPES / GDP PPP	100	76	71	60	57	..
Carbon intensity index - CO ₂ / TPES	100	113	101	134	136	..

1. Prior to 2000, data for Suriname were included in Other non-OECD Americas. 2. Please see Part I for methodological notes.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ³	Total	%change 00-16
CO₂ fuel combustion	-	1.9	-	-	1.9	..
Electricity and heat generation	-	0.9	-	-	0.9	..
Other energy industry own use	-	0.0	-	-	0.0	..
Manufacturing industries and construction	-	0.1	-	-	0.1	..
Transport	-	0.6	-	-	0.6	..
<i>of which: road</i>	-	0.4	-	-	0.4	..
Other	-	0.4	-	-	0.4	..
<i>of which: residential</i>	-	0.0	-	-	0.0	..
<i>of which: services</i>	-	0.0	-	-	0.0	..
<i>Memo: international marine bunkers</i>	-	0.1	-	-	0.1	..
<i>Memo: international aviation bunkers</i>	-	-	-	-	-	..

3. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ⁴ (%)	Cumulative total (%)
Main activity prod. elec. and heat - oil	0.6	..	..	..
Road - oil	0.4	..	..	..
Non-specified other - oil	0.3	..	..	..
Unallocated autoproducers - oil	0.3	..	..	..
Other transport - oil	0.2	..	..	..
Manufacturing industries - oil	0.1	..	..	..
Residential - oil	0.0	..	..	..
Other energy industry own use - oil	0.0	..	..	..
-	-	..	-	-
<i>Memo: total CO₂ from fuel combustion</i>	1.9	..	..	..

4. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Sweden

Figure 1. CO₂ emissions by fuel

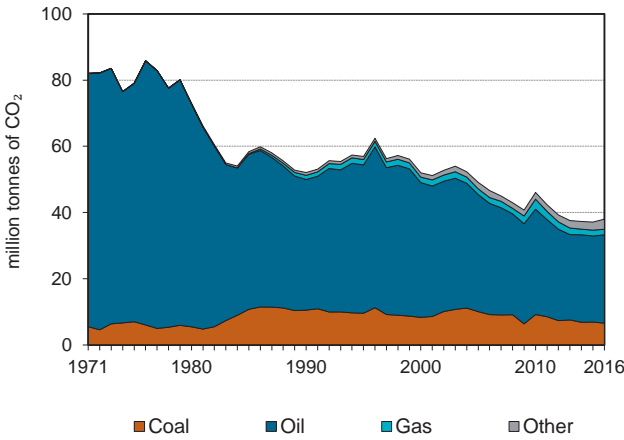


Figure 2. CO₂ emissions by sector

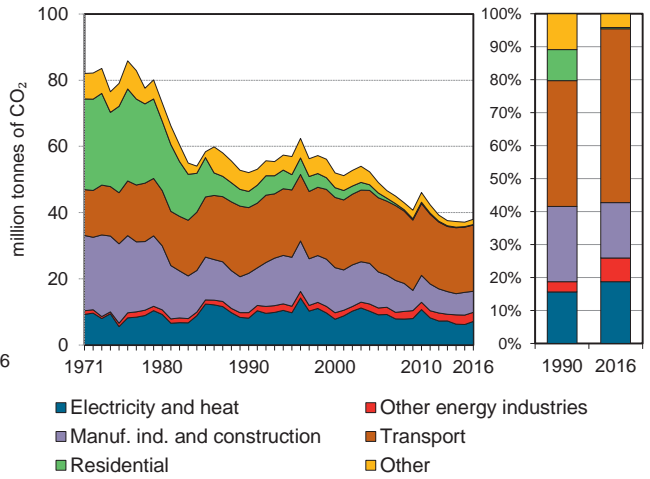


Figure 3. Electricity generation by fuel

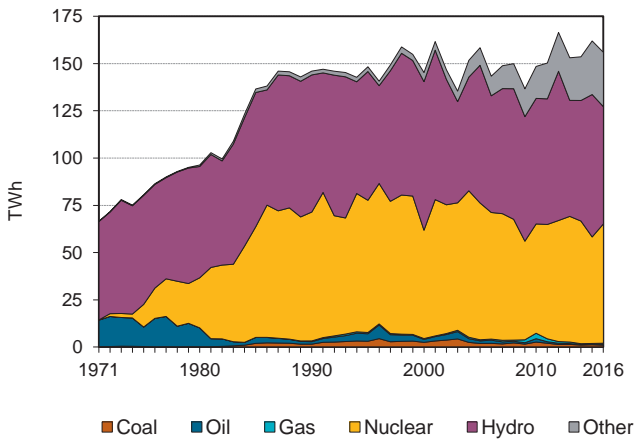


Figure 4. CO₂ from electricity generation: driving factors¹

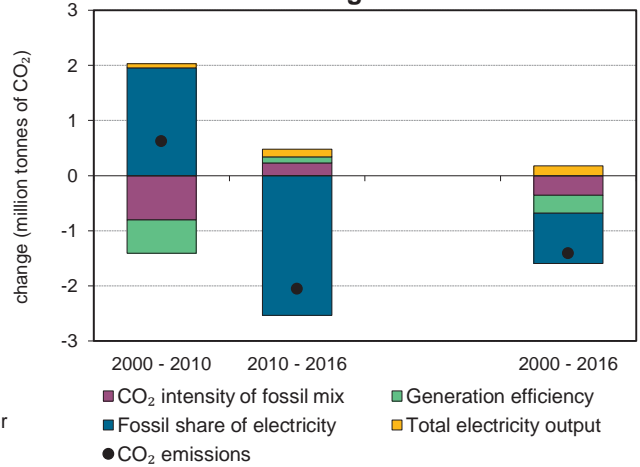


Figure 5. Changes in selected indicators

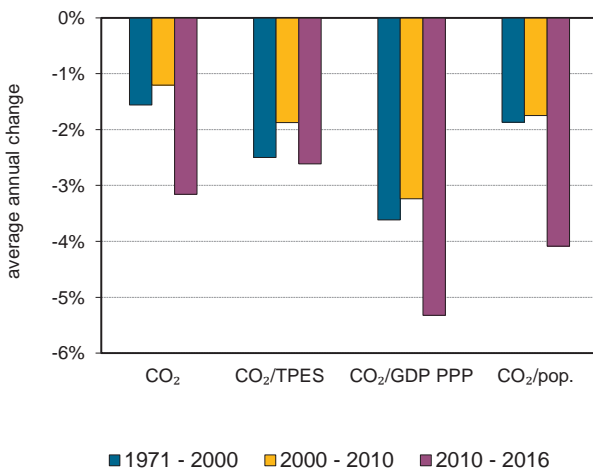
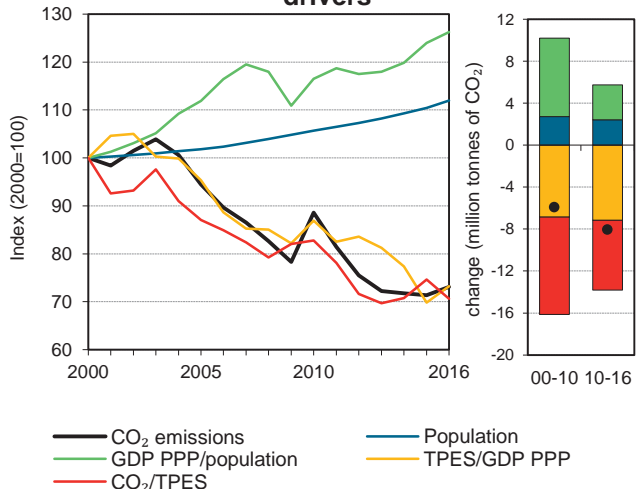


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Sweden

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	52.1	56.9	52.0	49.1	46.1	37.1	38.0	-27%
Share of World CO ₂ from fuel combustion	0.3%	0.3%	0.2%	0.2%	0.2%	0.1%	0.1%	
TPES (PJ)	1976	2 107	1 991	2 160	2 131	1 904	2 061	4%
GDP (billion 2010 USD)	321.1	332.7	396.5	451.4	488.4	542.8	560.4	75%
GDP PPP (billion 2010 USD)	256.9	266.2	317.3	361.2	390.8	434.3	448.4	75%
Population (millions)	8.6	8.8	8.9	9.0	9.4	9.8	9.9	16%
CO ₂ / TPES (tCO ₂ per TJ)	26.4	27.0	26.1	22.7	21.6	19.5	18.4	-30%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.16	0.2	0.1	0.1	0.1	0.1	0.1	-58%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.2	0.2	0.2	0.1	0.1	0.1	0.1	-58%
CO ₂ / population (tCO ₂ per capita)	6.1	6.5	5.9	5.4	4.9	3.8	3.8	-37%
Share of electricity output from fossil fuels	2%	5%	3%	3%	6%	2%	2%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	12	22	22	20	26	11	12	2%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	109	100	94	88	71	73	-27%
Population index	100	103	104	106	110	114	116	16%
GDP PPP per population index	100	100	119	133	139	148	150	50%
Energy intensity index - TPES / GDP PPP	100	103	82	78	71	57	60	-40%
Carbon intensity index - CO ₂ / TPES	100	103	99	86	82	74	70	-30%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16	
CO₂ fuel combustion	6.6		26.7	1.7	3.1	38.0	-27%
Electricity and heat generation	2.9		0.5	0.6	3.1	7.1	-12%
Other energy industry own use	0.3		2.4	0.0	-	2.8	67%
Manufacturing industries and construction	3.3		2.4	0.7	-	6.4	-46%
Transport	-		19.9	0.1	-	20.0	1%
<i>of which: road</i>	-		19.3	0.1	-	19.3	7%
Other	0.0		1.4	0.3	-	1.7	-83%
<i>of which: residential</i>	0.0		0.1	0.1	-	0.1	-97%
<i>of which: services</i>	0.0		1.1	0.2	-	1.3	-69%
<i>Memo: international marine bunkers</i>	-		6.3	-	-	6.3	199%
<i>Memo: international aviation bunkers</i>	-		2.5	-	-	2.5	127%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	19.3	18.0	35.8	35.8
Manufacturing industries - coal	3.3	4.6	6.1	41.9
Main activity prod. elec. and heat - other	3.1	0.8	5.7	47.6
Main activity prod. elec. and heat - coal	2.7	5.4	5.1	52.6
Other energy industry own use - oil	2.4	1.3	4.5	57.1
Manufacturing industries - oil	2.4	6.7	4.5	61.5
Non-specified other - oil	1.4	5.4	2.5	64.1
Other transport - oil	0.7	1.9	1.3	65.3
Manufacturing industries - gas	0.7	0.6	1.3	66.6
<i>Memo: total CO₂ from fuel combustion</i>	38.0	52.1	70.6	70.6

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Switzerland

Figure 1. CO₂ emissions by fuel

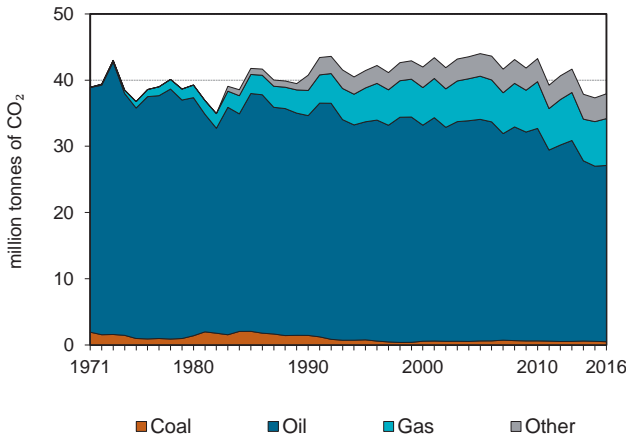


Figure 2. CO₂ emissions by sector

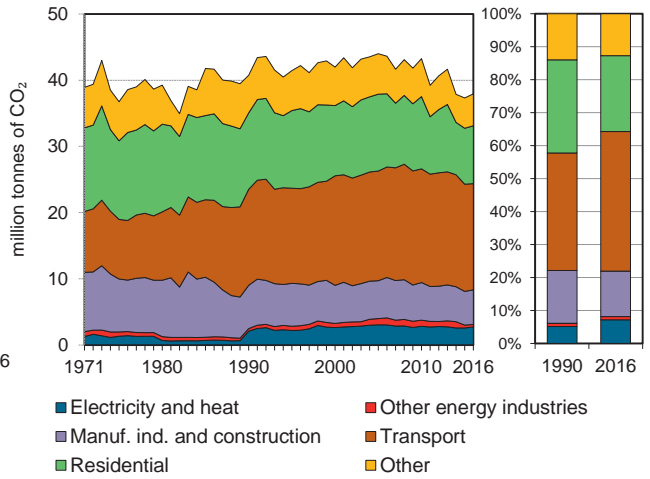


Figure 3. Electricity generation by fuel

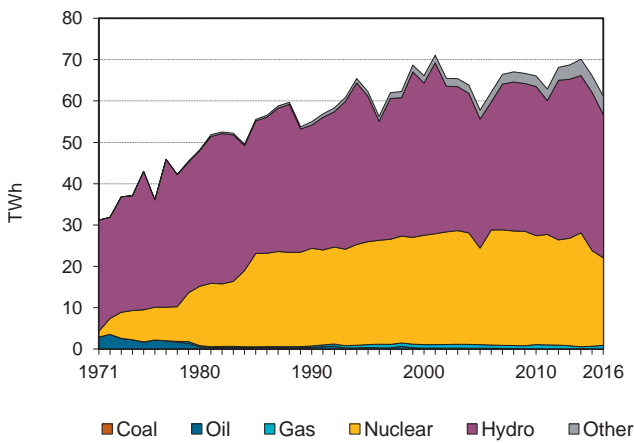


Figure 4. CO₂ from electricity generation: driving factors¹

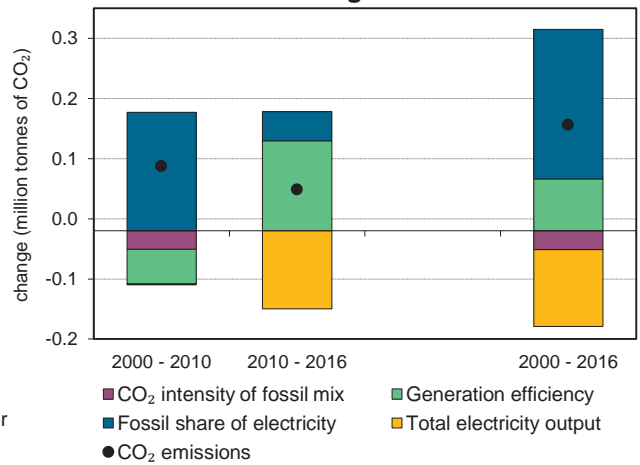


Figure 5. Changes in selected indicators

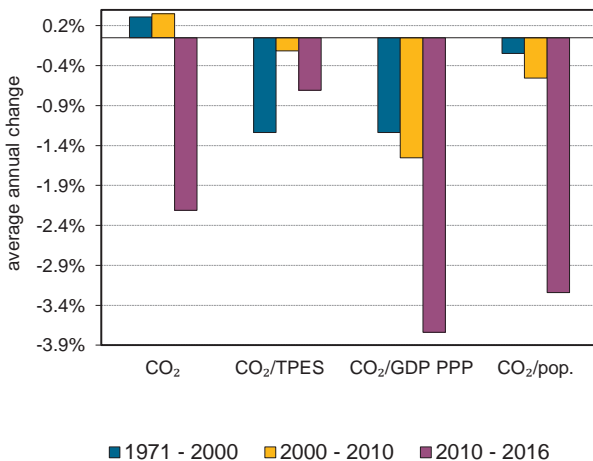
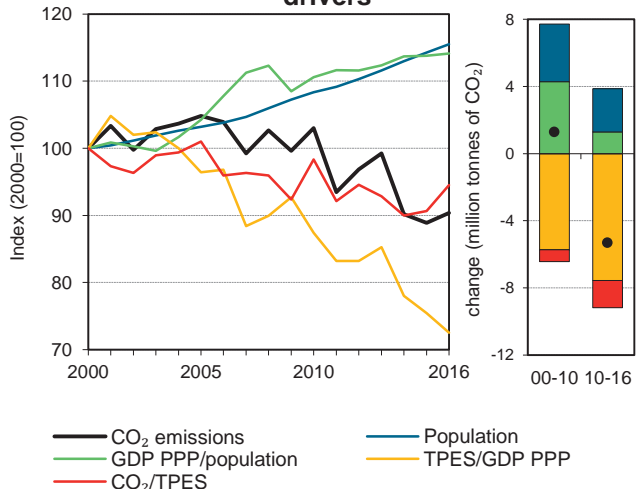


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Switzerland

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	40.8	41.5	42.0	44.0	43.3	37.3	37.9	-7%
Share of World CO ₂ from fuel combustion	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	
TPES (PJ)	1020	1 009	1 047	1 086	1 097	1 027	1 001	-2%
GDP (billion 2010 USD)	432.1	434.9	487.1	524.1	583.8	633.4	642.1	49%
GDP PPP (billion 2010 USD)	308	310.0	347.2	373.5	416.1	451.4	457.6	49%
Population (millions)	6.8	7.1	7.2	7.5	7.9	8.3	8.4	23%
CO ₂ / TPES (tCO ₂ per TJ)	40	41.1	40.1	40.5	39.4	36.3	37.9	-5%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.09	0.1	0.1	0.1	0.1	0.1	0.1	-37%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.13	0.1	0.1	0.1	0.1	0.1	0.1	-37%
CO ₂ / population (tCO ₂ per capita)	6	5.8	5.8	5.9	5.5	4.5	4.5	-24%
Share of electricity output from fossil fuels	2%	3%	3%	4%	3%	3%	4%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	22	21	23	29	25	24	28	27%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	102	103	108	106	92	93	-7%
Population index	100	104	107	110	116	122	123	23%
GDP PPP per population index	100	96	106	110	117	120	121	21%
Energy intensity index - TPES / GDP PPP	100	98	91	88	80	69	66	-34%
Carbon intensity index - CO ₂ / TPES	100	103	100	101	99	91	95	-5%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.5	26.6	7.1	3.8	37.9	-7%
Electricity and heat generation	-	0.0	0.5	2.2	2.7	30%
Other energy industry own use	-	0.4	0.0	-	0.4	1%
Manufacturing industries and construction	0.5	1.1	2.2	1.4	5.2	-20%
Transport	-	16.0	0.1	-	16.0	11%
<i>of which: road</i>	-	15.7	0.0	-	15.8	13%
Other	0.0	9.1	4.3	0.2	13.6	-21%
<i>of which: residential</i>	0.0	6.0	2.7	-	8.7	-24%
<i>of which: services</i>	-	2.6	1.5	0.2	4.3	-16%
<i>Memo: international marine bunkers</i>	-	0.0	-	-	0.0	-72%
<i>Memo: international aviation bunkers</i>	-	5.1	-	-	5.1	68%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	15.7	14.0	32.2	32.2
Residential - oil	6.0	10.2	12.3	44.5
Non-specified other - oil	3.1	4.6	6.4	50.8
Residential - gas	2.7	1.3	5.6	56.4
Manufacturing industries - gas	2.2	1.0	4.6	61.0
Unallocated autoproducers - other	2.2	1.1	4.4	65.4
Non-specified other - gas	1.5	0.9	3.1	68.5
Manufacturing industries - other	1.4	1.2	2.9	71.4
Manufacturing industries - oil	1.1	3.1	2.3	73.7
<i>Memo: total CO₂ from fuel combustion</i>	37.9	40.8	77.6	77.6

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Syrian Arab Republic

Figure 1. CO₂ emissions by fuel

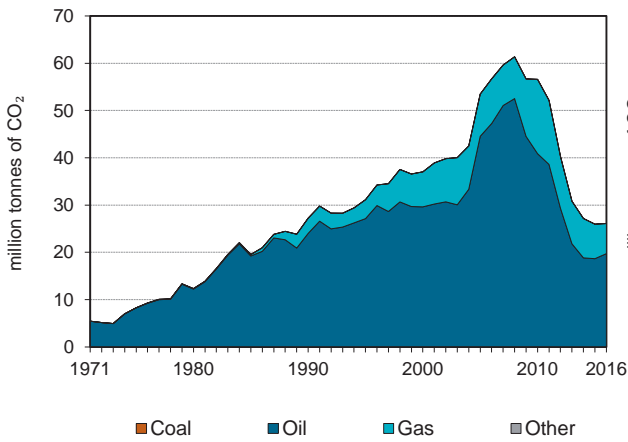


Figure 2. CO₂ emissions by sector

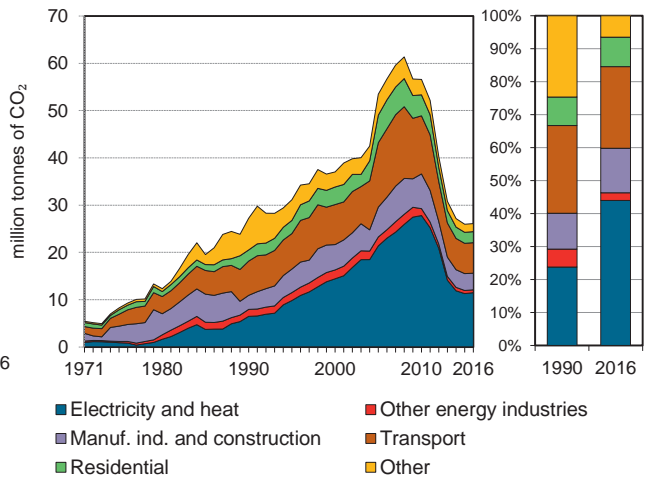


Figure 3. Electricity generation by fuel

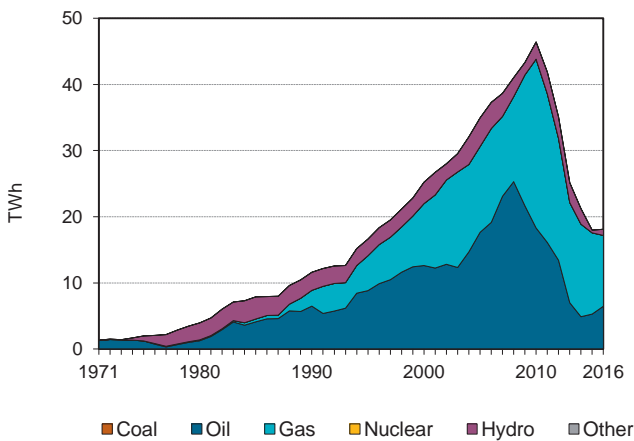


Figure 4. CO₂ from electricity generation: driving factors¹

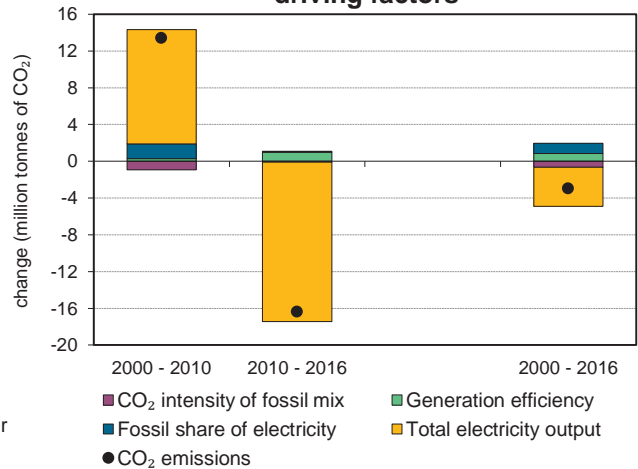


Figure 5. Changes in selected indicators

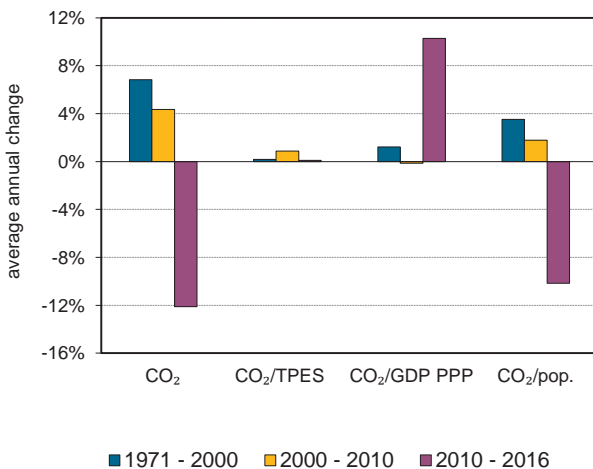
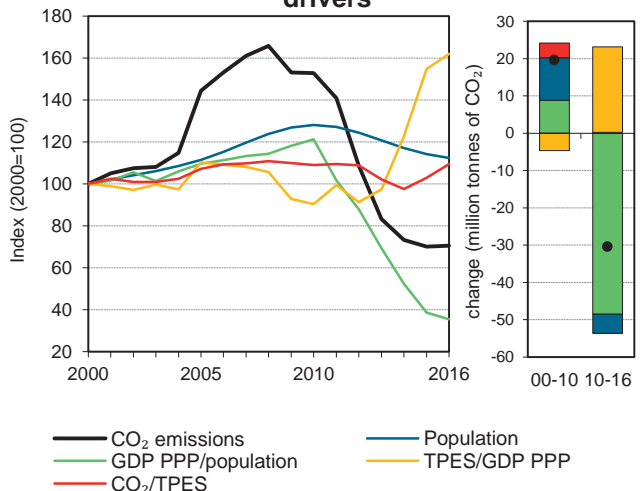


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Syrian Arab Republic

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	27.2	31.1	37.0	53.5	56.6	26.0	26.1	-4%
Share of World CO ₂ from fuel combustion	0.1%	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	
TPES (PJ)	438	507	647	871	907	441	416	-5%
GDP (billion 2010 USD)	24.2	36.2	38.6	47.2	59.9	17.0	15.3	-37%
GDP PPP (billion 2010 USD)	53.4	80.0	85.3	104.1	132.3	37.5	33.9	-37%
Population (millions)	12.5	14.3	16.4	18.3	21.0	18.7	18.4	48%
CO ₂ / TPES (tCO ₂ per TJ)	62.1	61.5	57.3	61.4	62.4	58.9	62.7	1%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.13	0.9	1.0	1.1	0.9	1.5	1.7	51%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.51	0.4	0.4	0.5	0.4	0.7	0.8	51%
CO ₂ / population (tCO ₂ per capita)	2.2	2.2	2.3	2.9	2.7	1.4	1.4	-35%
Share of electricity output from fossil fuels	77%	85%	87%	88%	94%	98%	95%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	558	591	572	612	599	628	634	14%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	114	136	196	208	95	96	-4%
Population index	100	115	132	147	169	151	148	48%
GDP PPP per population index	100	130	121	133	147	47	43	-57%
Energy intensity index - TPES / GDP PPP	100	77	92	102	84	143	150	50%
Carbon intensity index - CO ₂ / TPES	100	99	92	99	100	95	101	1%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.0	19.7	6.4	-	26.1	-4%
Electricity and heat generation	-	5.6	5.8	-	11.5	77%
Other energy industry own use	-	0.5	0.1	-	0.6	-59%
Manufacturing industries and construction	0.0	3.1	0.4	-	3.5	19%
Transport	-	6.4	-	-	6.4	-11%
<i>of which: road</i>	-	6.4	-	-	6.4	-12%
Other	-	4.0	-	-	4.0	-55%
<i>of which: residential</i>	-	2.3	-	-	2.3	-1%
<i>of which: services</i>	-	0.6	-	-	0.6	-2%
<i>Memo: international marine bunkers</i>	-	0.5	-	-	0.5	-83%
<i>Memo: international aviation bunkers</i>	-	0.1	-	-	0.1	-94%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	6.4	7.2	14.4	14.4
Main activity prod. elec. and heat - gas	5.8	1.3	13.3	27.7
Main activity prod. elec. and heat - oil	4.9	4.2	11.1	38.8
Manufacturing industries - oil	3.1	3.0	7.0	45.8
Residential - oil	2.3	2.4	5.3	51.1
Non-specified other - oil	1.7	4.9	3.9	55.0
Unallocated autoproducers - oil	0.7	1.0	1.7	56.7
Other energy industry own use - oil	0.5	1.3	1.1	57.8
Manufacturing industries - gas	0.4	-	1.0	58.8
<i>Memo: total CO₂ from fuel combustion</i>	<i>26.1</i>	<i>27.2</i>	<i>59.2</i>	<i>59.2</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Chinese Taipei

Figure 1. CO₂ emissions by fuel

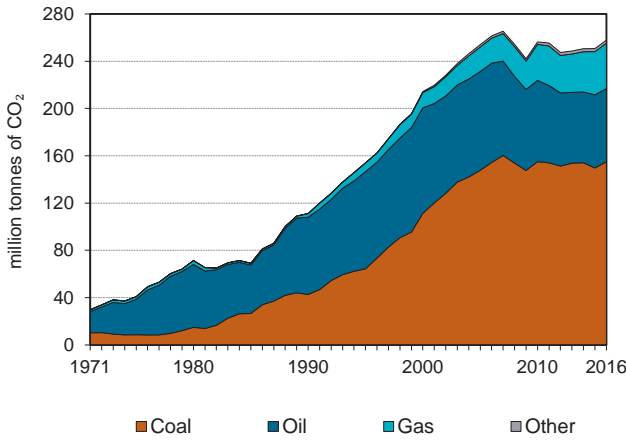


Figure 2. CO₂ emissions by sector

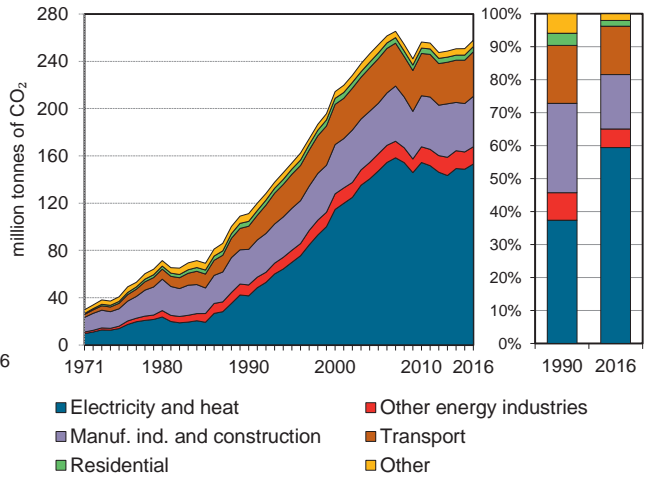


Figure 3. Electricity generation by fuel

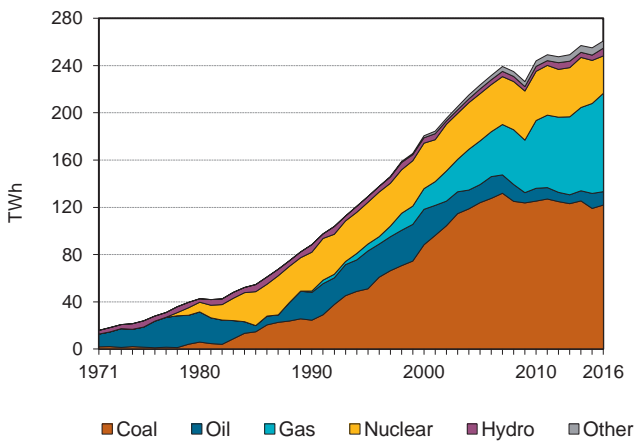


Figure 4. CO₂ from electricity generation: driving factors¹

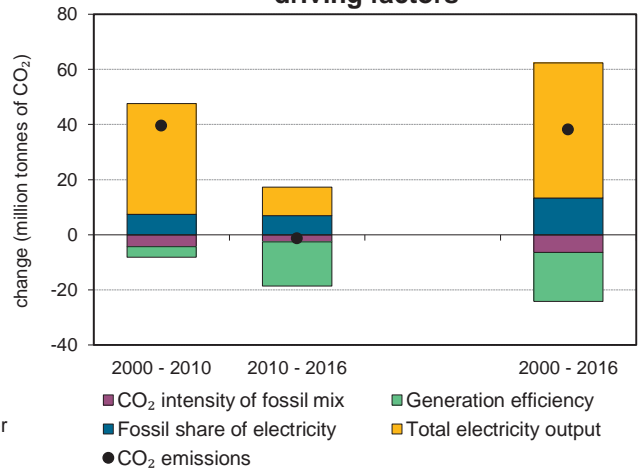


Figure 5. Changes in selected indicators

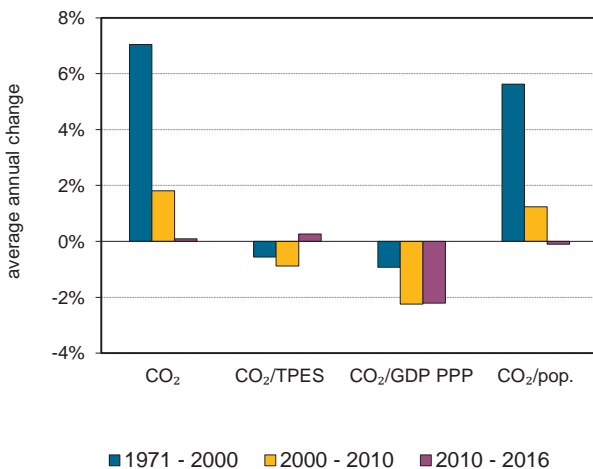
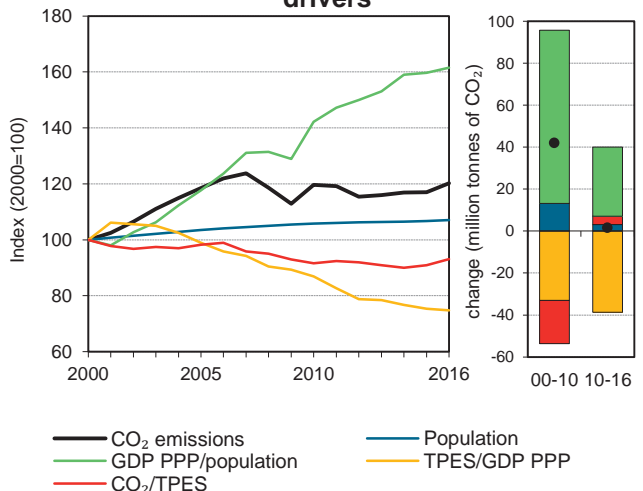


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Chinese Taipei

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	111.1	154.0	214.4	254.0	256.4	250.7	257.8	132%
Share of World CO ₂ from fuel combustion	0.5%	0.7%	0.9%	0.9%	0.8%	0.8%	0.8%	
TPES (PJ)	1999	2 660	3 552	4 282	4 639	4 568	4 592	130%
GDP (billion 2010 USD)	155.1	222.5	296.7	361.6	446.1	506.1	513.2	231%
GDP PPP (billion 2010 USD)	302.4	433.9	578.6	705.1	870.0	986.9	1 000.8	231%
Population (millions)	20.2	21.2	21.9	22.7	23.2	23.4	23.5	16%
CO ₂ / TPES (tCO ₂ per TJ)	55.6	57.9	60.3	59.3	55.3	54.9	56.2	1%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.72	0.7	0.7	0.7	0.6	0.5	0.5	-30%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.37	0.4	0.4	0.4	0.3	0.3	0.3	-30%
CO ₂ / population (tCO ₂ per capita)	5.5	7.3	9.8	11.2	11.1	10.7	11.0	100%
Share of electricity output from fossil fuels	56%	69%	76%	80%	80%	82%	84%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	470	542	635	659	633	583	587	25%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	139	193	229	231	226	232	132%
Population index	100	105	108	112	115	116	116	16%
GDP PPP per population index	100	137	176	208	251	282	285	185%
Energy intensity index - TPES / GDP PPP	100	93	93	92	81	70	69	-31%
Carbon intensity index - CO ₂ / TPES	100	104	109	107	99	99	101	1%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	155.0	62.0	38.3	2.6	257.8	132%
Electricity and heat generation	111.1	8.7	30.9	2.5	153.1	268%
Other energy industry own use	10.5	3.7	0.4	-	14.6	58%
Manufacturing industries and construction	33.4	5.2	4.0	0.0	42.6	42%
Transport	-	37.7	-	-	37.7	93%
<i>of which: road</i>	-	36.9	-	-	36.9	99%
Other	-	6.6	3.1	-	9.7	-9%
<i>of which: residential</i>	-	2.8	1.6	-	4.4	7%
<i>of which: services</i>	-	2.3	1.5	-	3.8	20%
<i>Memo: international marine bunkers</i>	-	4.0	-	-	4.0	-18%
<i>Memo: international aviation bunkers</i>	-	8.8	-	-	8.8	383%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	82.3	20.2	27.7	27.7
Road - oil	36.9	18.5	12.4	40.1
Manufacturing industries - coal	33.4	14.0	11.2	51.3
Main activity prod. elec. and heat - gas	30.7	0.6	10.3	61.7
Unallocated autoproducers - coal	28.8	4.4	9.7	71.4
Other energy industry - coal	10.5	4.1	3.5	74.9
Main activity prod. elec. and heat - oil	7.5	15.6	2.5	77.5
Manufacturing industries - oil	5.2	15.7	1.8	79.2
Manufacturing industries - gas	4.0	0.4	1.3	80.6
<i>Memo: total CO₂ from fuel combustion</i>	<i>257.8</i>	<i>111.1</i>	<i>86.8</i>	<i>86.8</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Tajikistan

Figure 1. CO₂ emissions by fuel

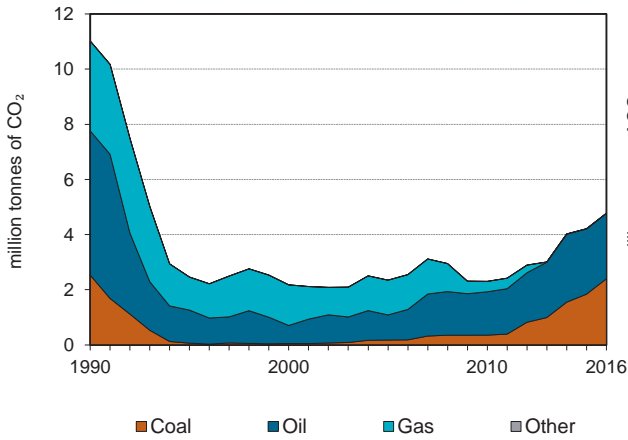


Figure 2. CO₂ emissions by sector

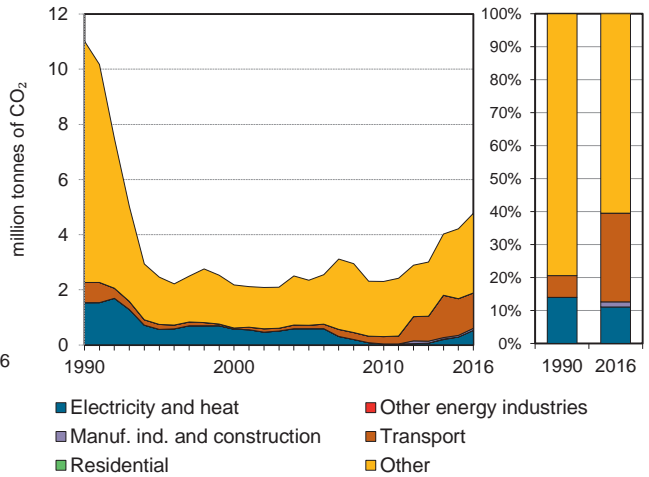


Figure 3. Electricity generation by fuel

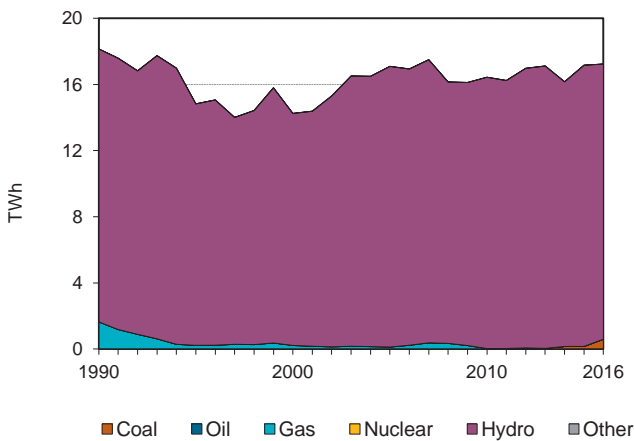


Figure 4. CO₂ from electricity generation: driving factors¹

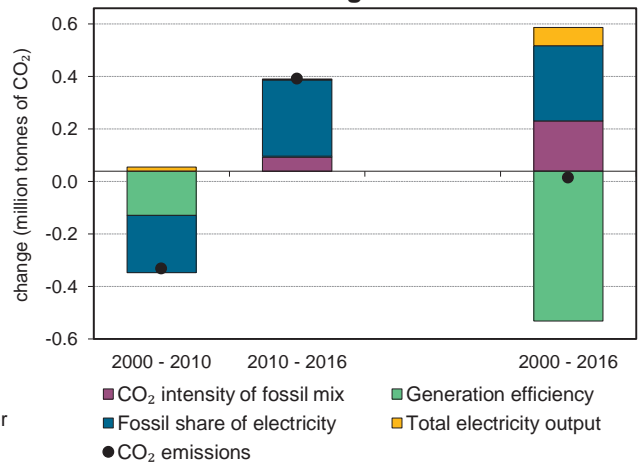


Figure 5. Changes in selected indicators

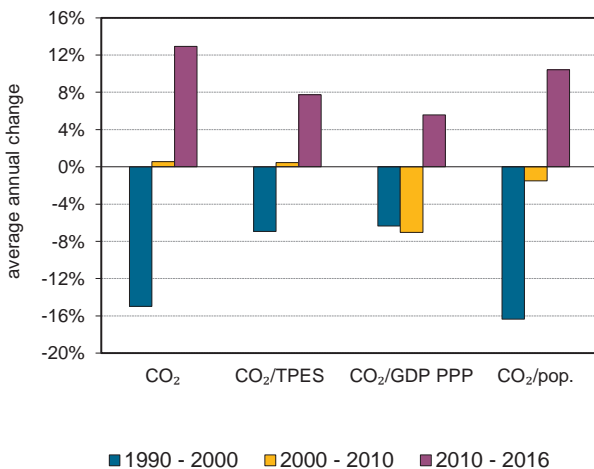
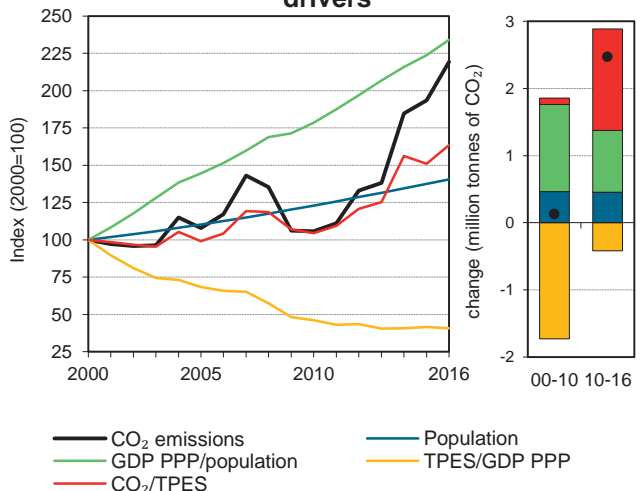


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Tajikistan

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	11	2.5	2.2	2.3	2.3	4.2	4.8	-57%
Share of World CO ₂ from fuel combustion	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	222	93	90	98	91	115	121	-46%
GDP (billion 2010 USD)	6.8	2.6	2.6	4.1	5.6	7.9	8.5	25%
GDP PPP (billion 2010 USD)	18.9	7.2	7.2	11.5	15.8	22.1	23.6	25%
Population (millions)	5.3	5.8	6.2	6.9	7.6	8.5	8.7	65%
CO ₂ / TPES (tCO ₂ per TJ)	49.6	26.4	24.2	24.0	25.3	36.5	39.5	-20%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.63	1.0	0.8	0.6	0.4	0.5	0.6	-65%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.58	0.3	0.3	0.2	0.1	0.2	0.2	-65%
CO ₂ / population (tCO ₂ per capita)	2.1	0.4	0.4	0.3	0.3	0.5	0.5	-74%
Share of electricity output from fossil fuels	9%	2%	2%	1%	0%	1%	4%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	68	25	26	21	1	8	21	-70%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	22	20	21	21	38	43	-57%
Population index	100	109	118	130	145	162	165	65%
GDP PPP per population index	100	35	32	47	58	72	76	-24%
Energy intensity index - TPES / GDP PPP	100	110	106	73	49	44	43	-57%
Carbon intensity index - CO ₂ / TPES	100	53	49	48	51	74	80	-20%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	2.4	2.4	0.0	-	4.8	-57%
Electricity and heat generation	0.5	-	-	-	0.5	-66%
Other energy industry own use	-	-	-	-	-	-
Manufacturing industries and construction	-	0.1	-	-	0.1	x
Transport	-	1.3	-	-	1.3	75%
<i>of which: road</i>	-	1.3	-	-	1.3	75%
Other	1.9	1.0	0.0	-	2.9	-67%
<i>of which: residential</i>	-	-	-	-	-	-
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.1	-	-	0.1	113%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Non-specified other sectors - coal	1.9	2.5	12.8	12.8
Road - oil	1.3	0.7	8.8	21.5
Non-specified other - oil	1.0	4.5	6.9	28.5
Main activity prod. elec. and heat - coal	0.5	-	3.6	32.1
Manufacturing industries - oil	0.1	-	0.5	32.6
Non-specified other - gas	0.0	1.7	0.0	32.6
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	4.8	11	32.6	32.6

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

United Republic of Tanzania

Figure 1. CO₂ emissions by fuel

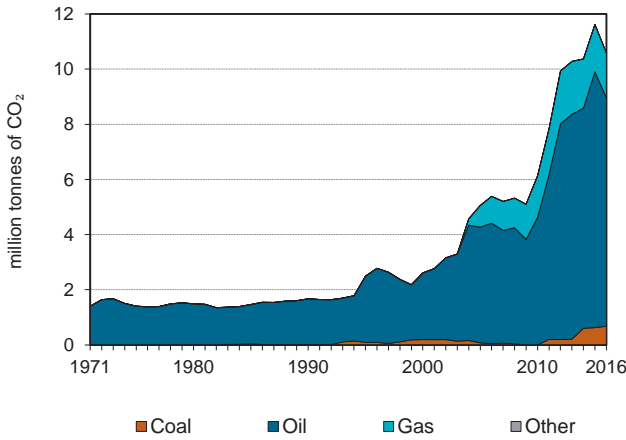


Figure 2. CO₂ emissions by sector

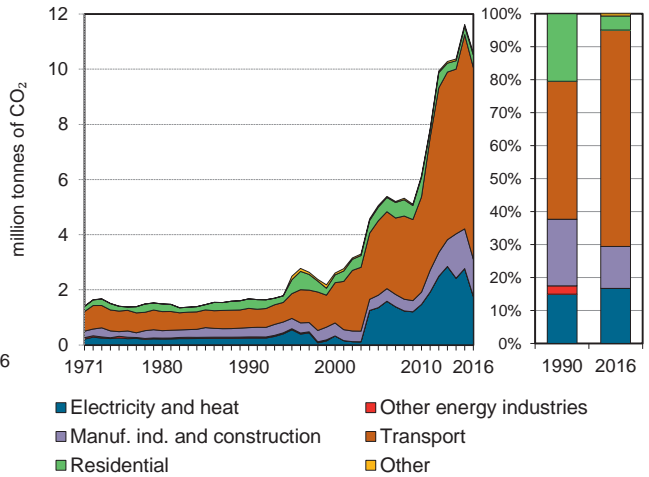


Figure 3. Electricity generation by fuel

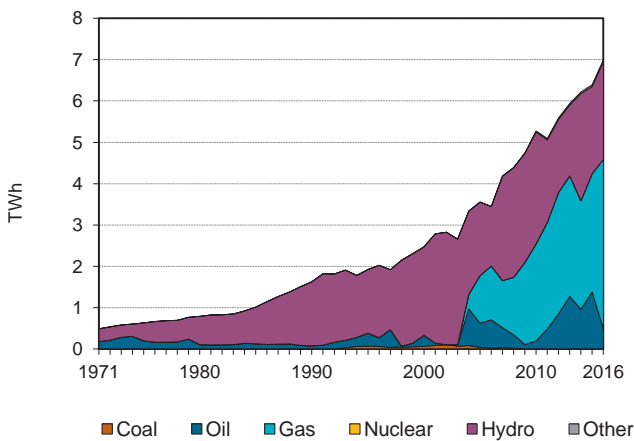


Figure 4. CO₂ from electricity generation: driving factors¹

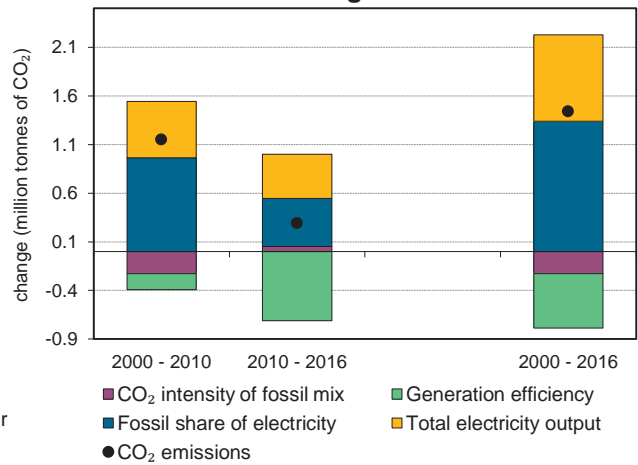


Figure 5. Changes in selected indicators

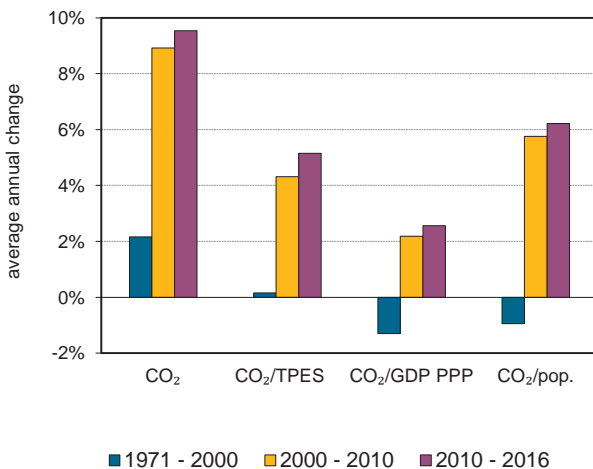
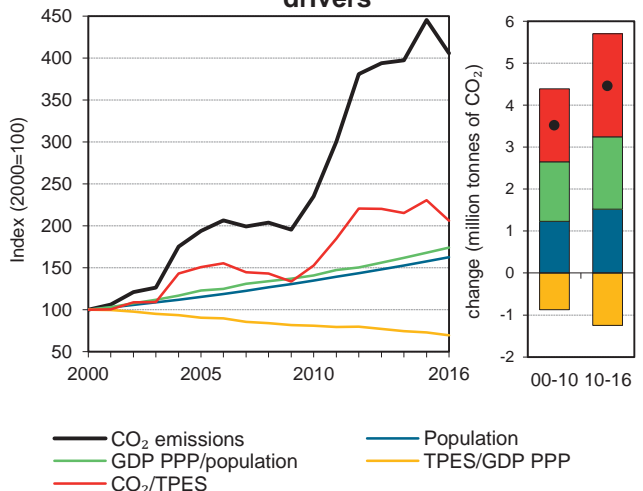


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

United Republic of Tanzania

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	1.7	2.5	2.6	5.1	6.1	11.6	10.6	534%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	408	462	564	724	868	1 089	1 109	172%
GDP (billion 2010 USD)	12.2	13.4	16.5	23.4	31.4	43.7	46.8	282%
GDP PPP (billion 2010 USD)	35.7	39.0	48.2	68.3	91.7	127.7	136.6	282%
Population (millions)	25.5	30.0	34.2	39.4	46.1	53.9	55.6	118%
CO ₂ / TPES (tCO ₂ per TJ)	4.1	5.4	4.6	7.0	7.1	10.7	9.5	133%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.14	0.2	0.2	0.2	0.2	0.3	0.2	65%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.05	0.1	0.1	0.1	0.1	0.1	0.1	66%
CO ₂ / population (tCO ₂ per capita)	0.1	0.1	0.1	0.1	0.1	0.2	0.2	189%
Share of electricity output from fossil fuels	5%	20%	14%	50%	48%	66%	66%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	154	286	132	381	279	433	252	64%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	149	156	303	367	696	634	534%
Population index	100	118	134	155	181	212	218	118%
GDP PPP per population index	100	93	101	123	142	169	175	75%
Energy intensity index - TPES / GDP PPP	100	104	102	93	83	75	71	-29%
Carbon intensity index - CO ₂ / TPES	100	132	113	170	172	260	233	133%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.7	8.3	1.6	-	10.6	534%
Electricity and heat generation	-	0.5	1.3	-	1.8	604%
Other energy industry own use	-	-	-	-	-	-100%
Manufacturing industries and construction	0.7	0.3	0.3	-	1.3	300%
Transport	-	7.0	-	-	7.0	894%
<i>of which: road</i>	-	7.0	-	-	7.0	894%
Other	-	0.5	-	-	0.5	54%
<i>of which: residential</i>	-	0.5	-	-	0.5	34%
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	0.2	-	-	0.2	169%
<i>Memo: international aviation bunkers</i>	-	0.5	-	-	0.5	126%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	7.0	0.7	7.5	7.5
Main activity prod. elec. and heat - gas	1.3	-	1.4	8.9
Manufacturing industries - coal	0.7	0.0	0.7	9.6
Main activity prod. elec. and heat - oil	0.5	0.3	0.5	10.1
Residential - oil	0.5	0.3	0.5	10.6
Manufacturing industries - gas	0.3	-	0.4	11.0
Manufacturing industries - oil	0.3	0.3	0.4	11.3
Non-specified other - oil	0.1	-	0.1	11.4
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	<i>10.6</i>	<i>1.7</i>	<i>11.4</i>	<i>11.4</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Thailand

Figure 1. CO₂ emissions by fuel

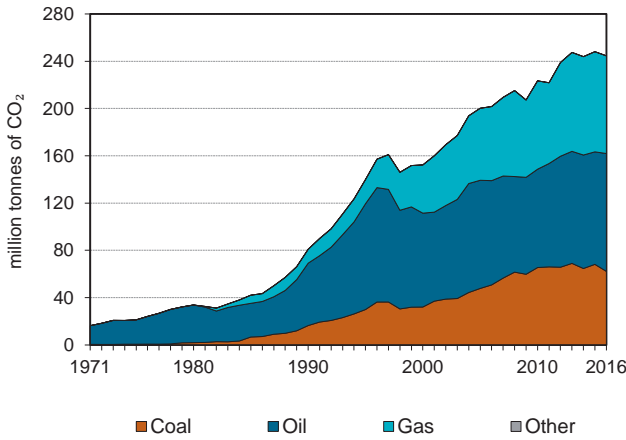


Figure 2. CO₂ emissions by sector

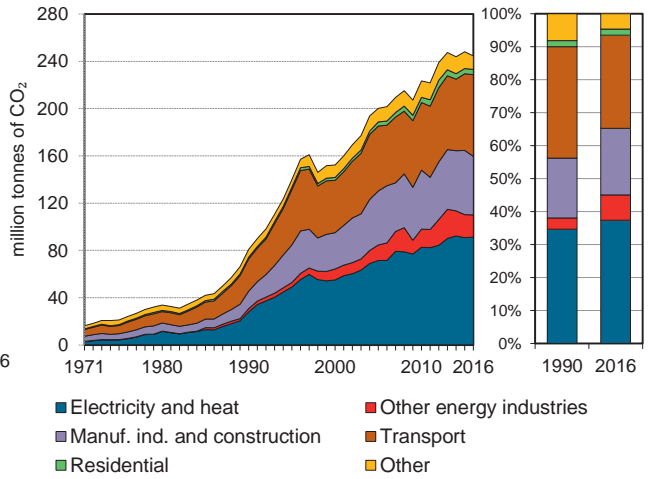


Figure 3. Electricity generation by fuel

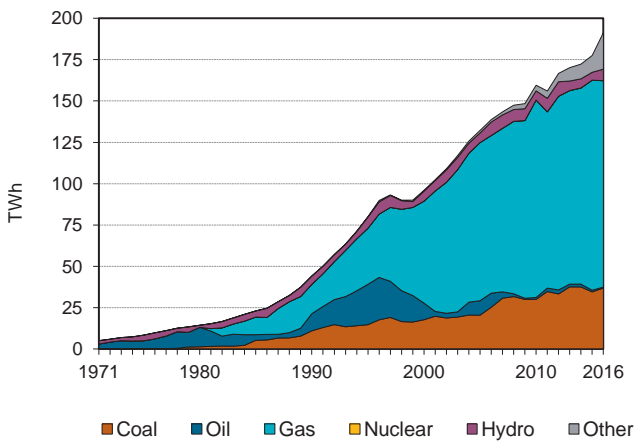


Figure 4. CO₂ from electricity generation: driving factors¹

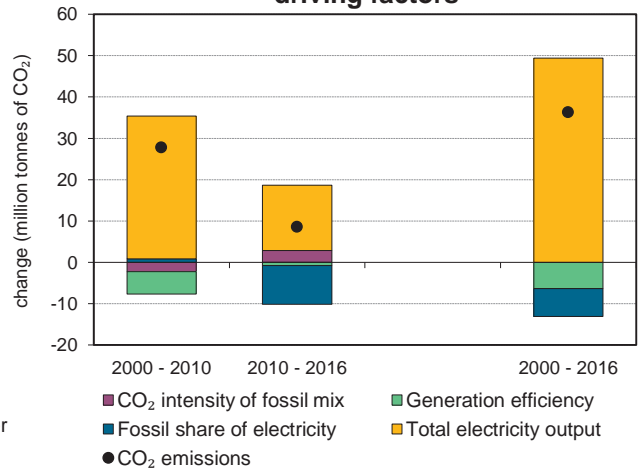


Figure 5. Changes in selected indicators

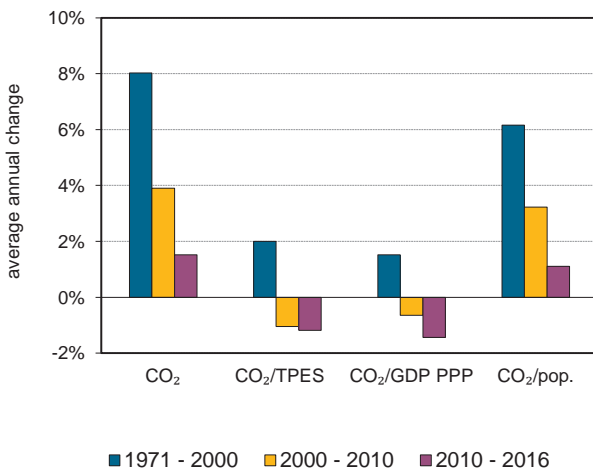
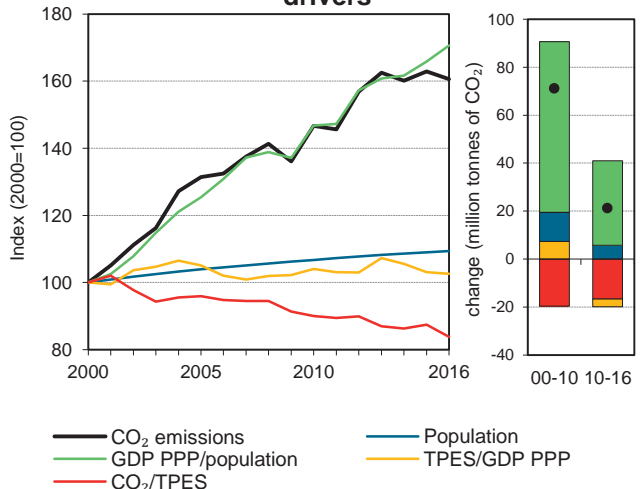


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Thailand

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	80.9	139.9	152.3	200.2	223.4	248.1	244.6	202%
Share of World CO ₂ from fuel combustion	0.4%	0.7%	0.7%	0.7%	0.7%	0.8%	0.8%	
TPES (PJ)	1756	2 593	3 027	4 146	4 934	5 641	5 800	230%
GDP (billion 2010 USD)	141.6	210.0	217.7	283.8	341.1	393.7	406.4	187%
GDP PPP (billion 2010 USD)	368.7	546.8	566.8	738.8	888.1	1 025.0	1 058.1	187%
Population (millions)	56.6	59.5	63.0	65.4	67.2	68.7	68.9	22%
CO ₂ / TPES (tCO ₂ per TJ)	46.1	54.0	50.3	48.3	45.3	44.0	42.2	-8%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.57	0.7	0.7	0.7	0.7	0.6	0.6	5%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.22	0.3	0.3	0.3	0.3	0.2	0.2	5%
CO ₂ / population (tCO ₂ per capita)	1.4	2.4	2.4	3.1	3.3	3.6	3.6	148%
Share of electricity output from fossil fuels	89%	91%	93%	95%	94%	92%	85%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	634	612	573	541	518	512	477	-25%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	173	188	248	276	307	302	202%
Population index	100	105	111	116	119	121	122	22%
GDP PPP per population index	100	141	138	173	203	229	236	136%
Energy intensity index - TPES / GDP PPP	100	100	112	118	117	116	115	15%
Carbon intensity index - CO ₂ / TPES	100	117	109	105	98	96	92	-8%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	62.2	99.7	82.6	-	244.6	202%
Electricity and heat generation	38.1	0.4	52.8	-	91.3	226%
Other energy industry own use	-	1.9	16.8	-	18.8	585%
Manufacturing industries and construction	24.2	17.6	7.7	-	49.5	236%
Transport	-	63.9	5.3	-	69.2	153%
<i>of which: road</i>	-	60.2	5.3	-	65.5	153%
Other	-	15.8	0.0	-	15.8	96%
<i>of which: residential</i>	-	4.4	-	-	4.4	203%
<i>of which: services</i>	-	2.1	0.0	-	2.1	116%
<i>Memo: international marine bunkers</i>	-	4.0	-	-	4.0	132%
<i>Memo: international aviation bunkers</i>	-	12.6	-	-	12.6	123%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	60.2	25.9	15.1	15.1
Main activity prod. elec. and heat - gas	44.1	9.0	11.1	26.2
Main activity prod. elec. and heat - coal	32.2	10.8	8.1	34.3
Manufacturing industries - coal	24.2	5.6	6.1	40.4
Manufacturing industries - oil	17.6	8.8	4.4	44.8
Other energy industry own use - gas	16.8	2.4	4.2	49.0
Non-specified other - oil	11.4	6.6	2.9	51.9
Unallocated autoproducers - gas	8.7	-	2.2	54.0
Manufacturing industries - gas	7.7	0.3	1.9	56.0
<i>Memo: total CO₂ from fuel combustion</i>	<i>244.6</i>	<i>80.9</i>	<i>61.4</i>	<i>61.4</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Togo

Figure 1. CO₂ emissions by fuel

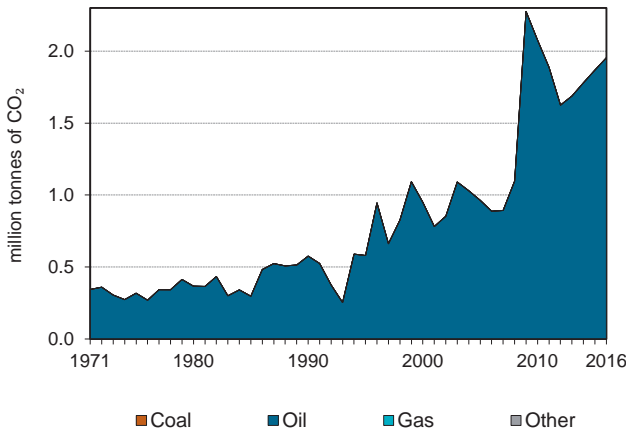


Figure 2. CO₂ emissions by sector

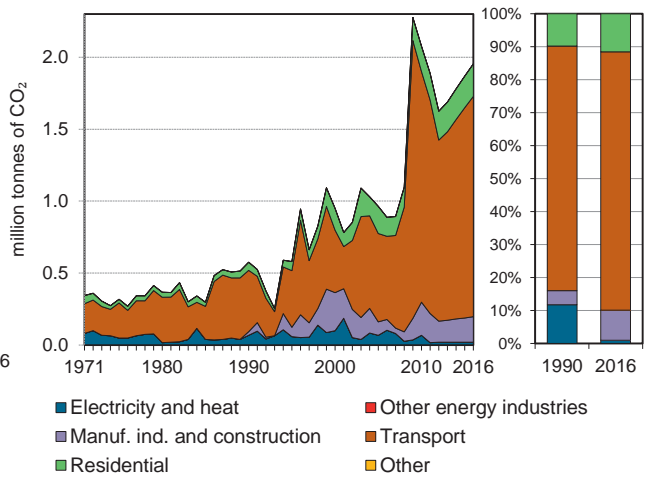


Figure 3. Electricity generation by fuel

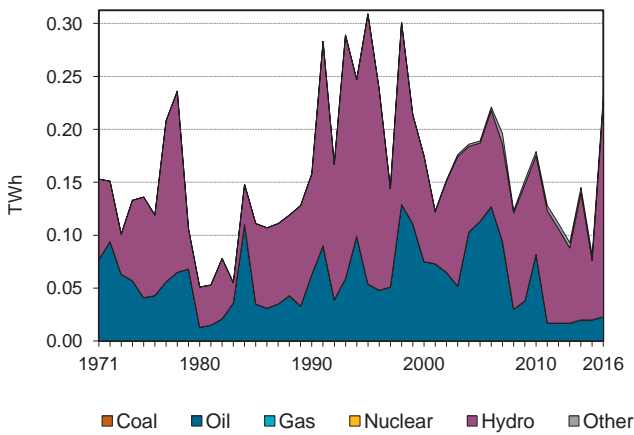


Figure 4. CO₂ from electricity generation: driving factors¹

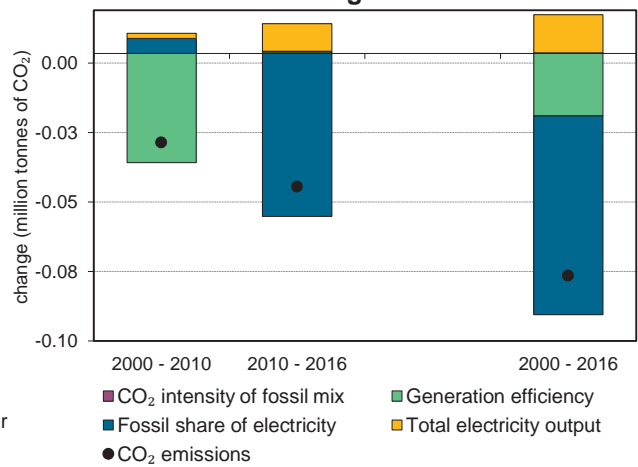


Figure 5. Changes in selected indicators

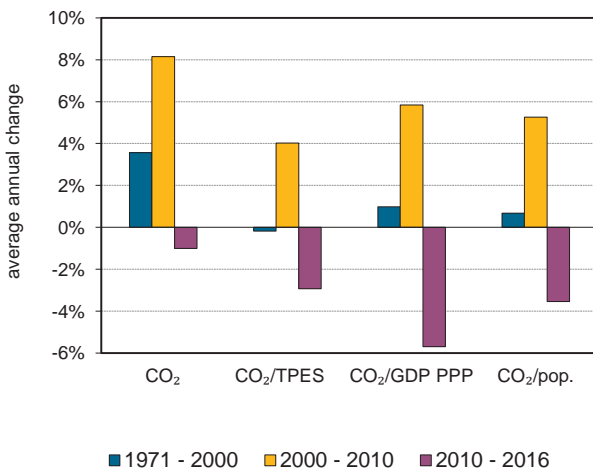
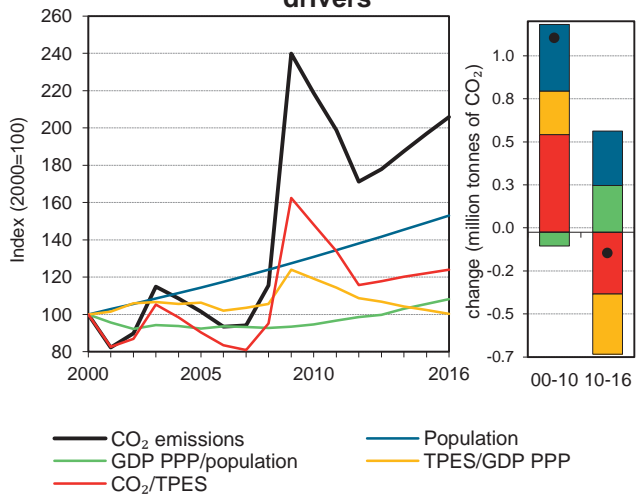


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Togo

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	0.6	0.6	0.9	1.0	2.1	1.9	2.0	240%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	53	66	88	99	130	143	147	177%
GDP (billion 2010 USD)	2.1	2.1	2.6	2.7	3.2	4.0	4.2	106%
GDP PPP (billion 2010 USD)	5	5.0	6.2	6.6	7.7	9.8	10.3	106%
Population (millions)	3.8	4.3	5.0	5.7	6.5	7.4	7.6	101%
CO ₂ / TPES (tCO ₂ per TJ)	10.9	8.8	10.7	9.7	15.9	13.1	13.3	22%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.28	0.3	0.4	0.4	0.7	0.5	0.5	65%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.12	0.1	0.2	0.1	0.3	0.2	0.2	65%
CO ₂ / population (tCO ₂ per capita)	0.2	0.1	0.2	0.2	0.3	0.3	0.3	69%
Share of electricity output from fossil fuels	40%	18%	43%	60%	46%	25%	10%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	426	187	567	356	375	237	83	-81%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	101	165	167	361	325	340	240%
Population index	100	113	131	150	172	196	201	101%
GDP PPP per population index	100	89	95	87	89	100	102	2%
Energy intensity index - TPES / GDP PPP	100	123	135	143	160	138	135	35%
Carbon intensity index - CO ₂ / TPES	100	81	99	89	146	121	122	22%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	2.0	-	-	2.0	240%
Electricity and heat generation	-	0.0	-	-	0.0	-71%
Other energy industry own use	-	-	-	-	-	-
Manufacturing industries and construction	-	0.2	-	-	0.2	613%
Transport	-	1.5	-	-	1.5	259%
<i>of which: road</i>	-	1.5	-	-	1.5	259%
Other	-	0.2	-	-	0.2	299%
<i>of which: residential</i>	-	0.2	-	-	0.2	299%
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	0.1	-	-	0.1	x
<i>Memo: international aviation bunkers</i>	-	0.3	-	-	0.3	158%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	1.5	0.4	16.7	16.7
Residential - oil	0.2	0.1	2.5	19.2
Manufacturing industries - oil	0.2	0.0	1.9	21.1
Main activity prod. elec. and heat - oil	0.0	0.1	0.1	21.3
Unallocated autoproducers - oil	0.0	0.0	0.1	21.3
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
<i>Memo: total CO₂ from fuel combustion</i>	2.0	0.6	21.3	21.3

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Trinidad and Tobago

Figure 1. CO₂ emissions by fuel

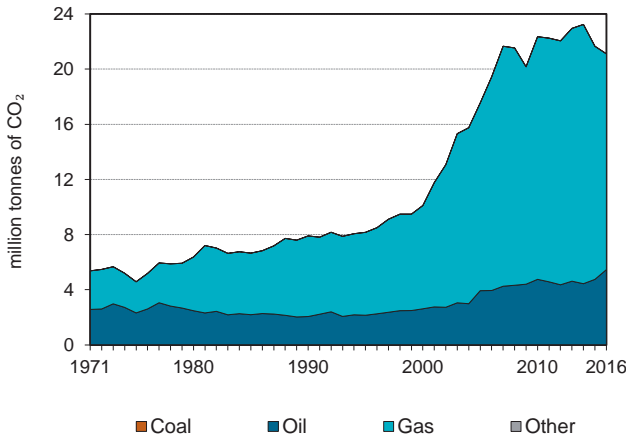


Figure 2. CO₂ emissions by sector

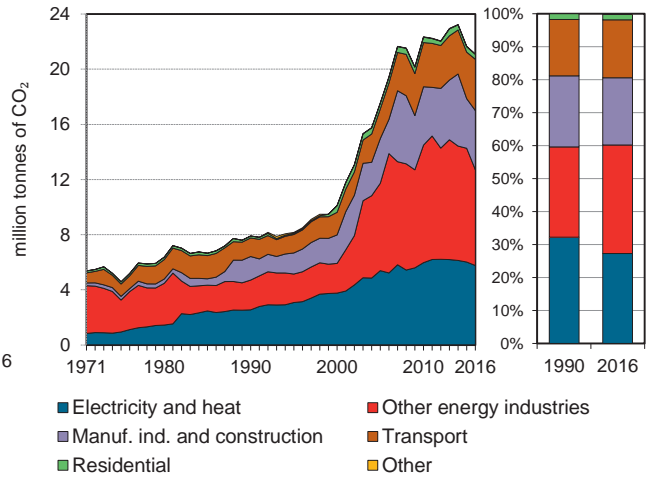


Figure 3. Electricity generation by fuel

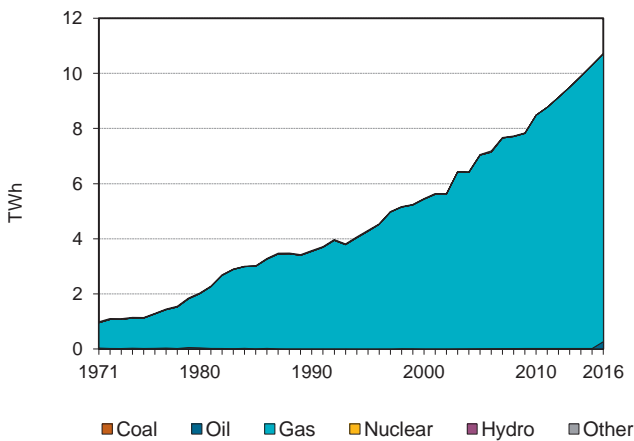


Figure 4. CO₂ from electricity generation: driving factors¹

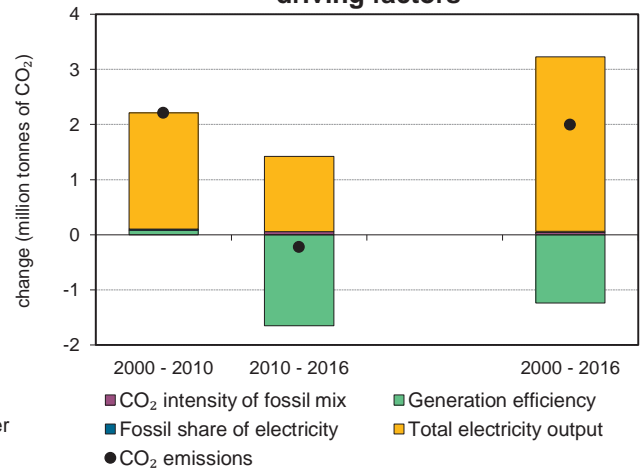


Figure 5. Changes in selected indicators

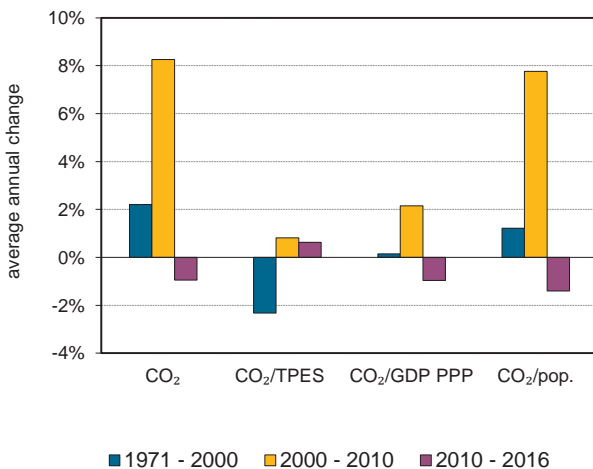
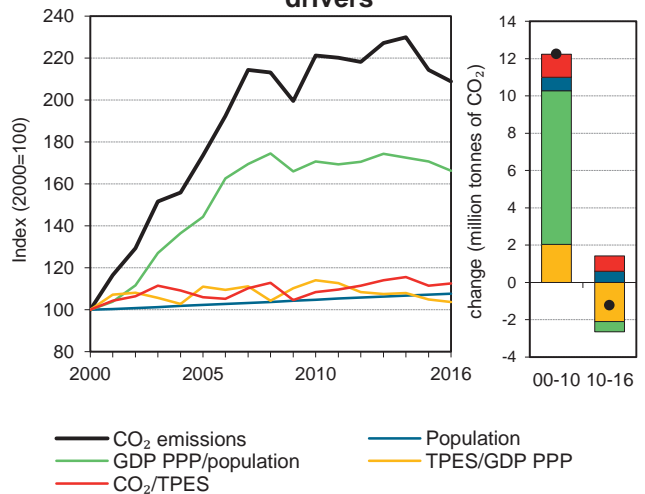


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Trinidad and Tobago

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	7.9	8.2	10.1	17.5	22.4	21.7	21.1	167%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	
TPES (PJ)	251	258	412	675	840	792	764	205%
GDP (billion 2010 USD)	8	8.6	12.4	18.3	22.2	22.7	21.5	170%
GDP PPP (billion 2010 USD)	14.7	15.8	22.8	33.6	40.7	41.7	40.7	178%
Population (millions)	1.2	1.3	1.3	1.3	1.3	1.4	1.4	12%
CO ₂ / TPES (tCO ₂ per TJ)	31.5	31.7	24.5	26.0	26.6	27.3	27.6	-12%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.99	0.9	0.8	1.0	1.0	1.0	1.0	-1%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.54	0.5	0.4	0.5	0.5	0.5	0.5	-4%
CO ₂ / population (tCO ₂ per capita)	6.5	6.5	8.0	13.5	16.8	15.9	15.5	139%
Share of electricity output from fossil fuels	99%	99%	100%	100%	100%	100%	100%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	712	715	689	764	704	584	538	-24%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	103	128	222	283	274	267	167%
Population index	100	103	104	106	109	111	112	12%
GDP PPP per population index	100	105	150	216	255	255	249	149%
Energy intensity index - TPES / GDP PPP	100	95	106	118	121	111	110	10%
Carbon intensity index - CO ₂ / TPES	100	101	78	82	84	87	88	-12%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	5.5	15.7	-	21.1	167%
Electricity and heat generation	-	0.3	5.5	-	5.8	126%
Other energy industry own use	-	0.6	6.3	-	6.9	222%
Manufacturing industries and construction	-	0.7	3.6	-	4.3	151%
Transport	-	3.7	-	-	3.7	176%
<i>of which: road</i>	-	3.4	-	-	3.4	160%
Other	-	0.2	0.2	-	0.4	176%
<i>of which: residential</i>	-	0.2	0.2	-	0.4	154%
<i>of which: services</i>	-	0.0	-	-	0.0	x
<i>Memo: international marine bunkers</i>	-	1.8	-	-	1.8	+
<i>Memo: international aviation bunkers</i>	-	1.0	-	-	1.0	398%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Other energy industry own use - gas	6.3	1.9	10.1	10.1
Main activity prod. elec. and heat - gas	5.5	2.4	8.7	18.9
Manufacturing industries - gas	3.6	1.4	5.8	24.7
Road - oil	3.4	1.3	5.4	30.1
Manufacturing industries - oil	0.7	0.3	1.0	31.2
Other energy industry own use - oil	0.6	0.3	1.0	32.1
Other transport - oil	0.3	0.0	0.6	32.7
Main activity prod. elec. and heat - oil	0.3	0.0	0.4	33.1
Residential - oil	0.2	0.1	0.3	33.4
<i>Memo: total CO₂ from fuel combustion</i>	21.1	7.9	33.8	33.8

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Tunisia

Figure 1. CO₂ emissions by fuel

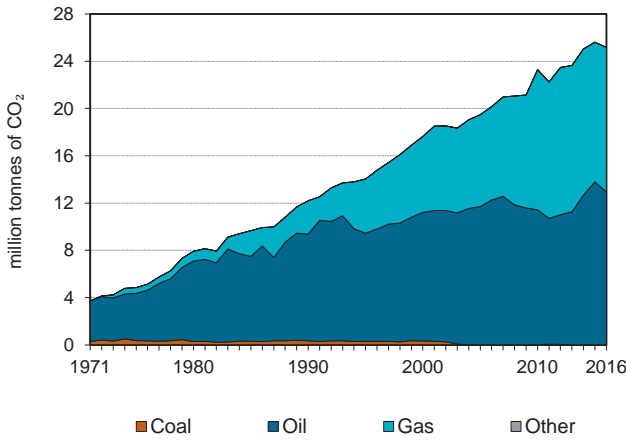


Figure 2. CO₂ emissions by sector

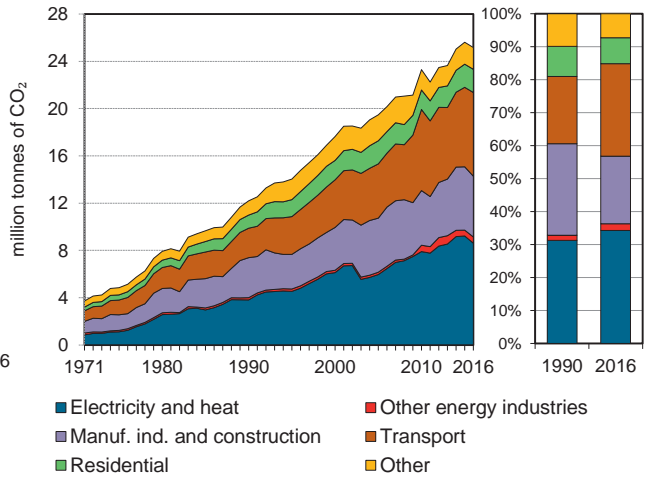


Figure 3. Electricity generation by fuel

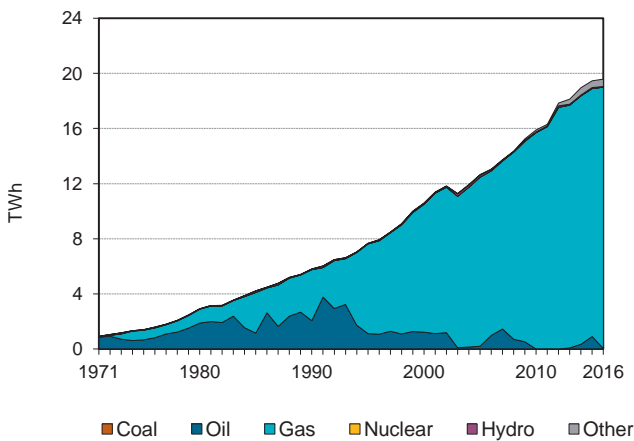


Figure 4. CO₂ from electricity generation: driving factors¹

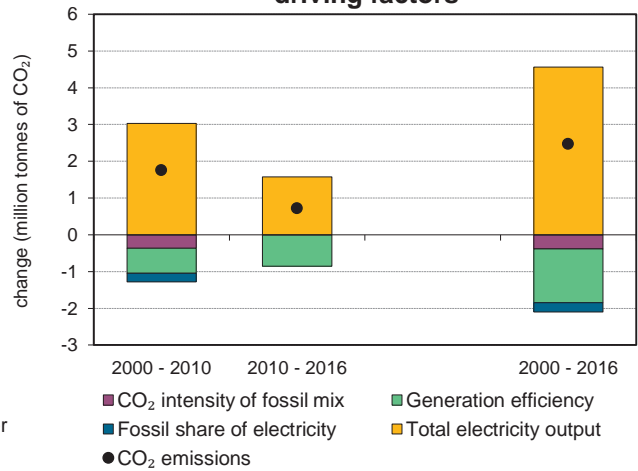


Figure 5. Changes in selected indicators

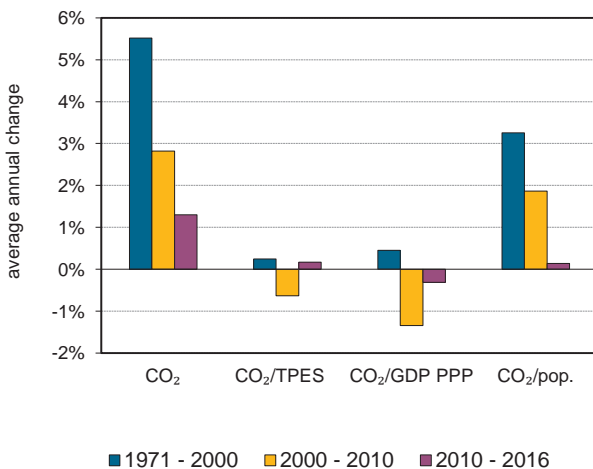
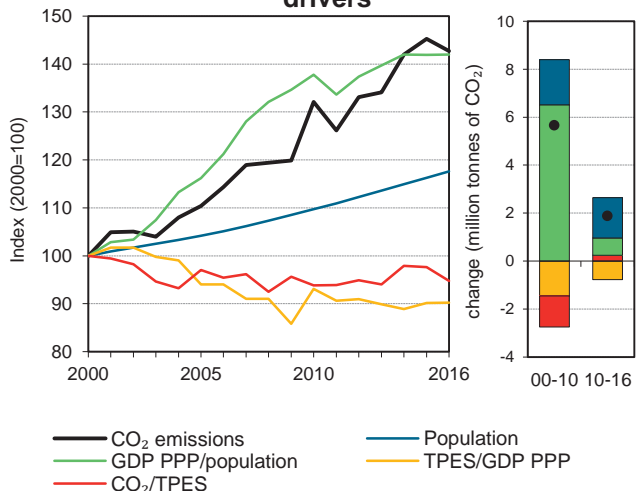


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Tunisia

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	12.2	14.0	17.6	19.5	23.3	25.6	25.2	106%
Share of World CO ₂ from fuel combustion	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	
TPES (PJ)	207	243	306	348	431	455	461	122%
GDP (billion 2010 USD)	18.3	22.2	29.1	35.3	44.1	48.1	48.6	165%
GDP PPP (billion 2010 USD)	45.3	54.8	72.0	87.1	108.8	118.7	120.1	165%
Population (millions)	8.2	9.1	9.7	10.1	10.6	11.3	11.4	39%
CO ₂ / TPES (tCO ₂ per TJ)	58.9	57.8	57.7	55.9	54.1	56.3	54.7	-7%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.67	0.6	0.6	0.6	0.5	0.5	0.5	-22%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.27	0.3	0.2	0.2	0.2	0.2	0.2	-22%
CO ₂ / population (tCO ₂ per capita)	1.5	1.5	1.8	1.9	2.2	2.3	2.2	49%
Share of electricity output from fossil fuels	99%	100%	99%	99%	96%	96%	96%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	656	592	578	471	483	469	435	-34%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	115	145	160	191	210	206	106%
Population index	100	111	118	123	129	137	139	39%
GDP PPP per population index	100	109	135	157	186	191	191	91%
Energy intensity index - TPES / GDP PPP	100	97	93	87	87	84	84	-16%
Carbon intensity index - CO ₂ / TPES	100	98	98	95	92	96	93	-7%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	12.9	12.2	-	25.2	106%
Electricity and heat generation	-	0.1	8.6	-	8.6	126%
Other energy industry own use	-	0.1	0.4	-	0.5	179%
Manufacturing industries and construction	-	3.3	1.8	-	5.1	52%
Transport	-	6.5	0.5	-	7.1	184%
<i>of which: road</i>	-	6.5	-	-	6.5	163%
Other	-	2.9	0.9	-	3.8	64%
<i>of which: residential</i>	-	1.5	0.5	-	2.0	77%
<i>of which: services</i>	-	0.3	0.4	-	0.7	26%
<i>Memo: international marine bunkers</i>	-	0.0	-	-	0.0	-91%
<i>Memo: international aviation bunkers</i>	-	0.7	-	-	0.7	16%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - gas	8.1	2.1	19.6	19.6
Road - oil	6.5	2.5	15.7	35.3
Manufacturing industries - oil	3.3	2.4	8.0	43.3
Manufacturing industries - gas	1.8	0.6	4.5	47.7
Residential - oil	1.5	1.0	3.5	51.3
Non-specified other - oil	1.4	1.2	3.5	54.7
Other transport - gas	0.5	-	1.3	56.1
Residential - gas	0.5	0.1	1.2	57.3
Unallocated autoproducers - gas	0.4	-	1.1	58.3
<i>Memo: total CO₂ from fuel combustion</i>	<i>25.2</i>	<i>12.2</i>	<i>60.9</i>	<i>60.9</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Turkey

Figure 1. CO₂ emissions by fuel

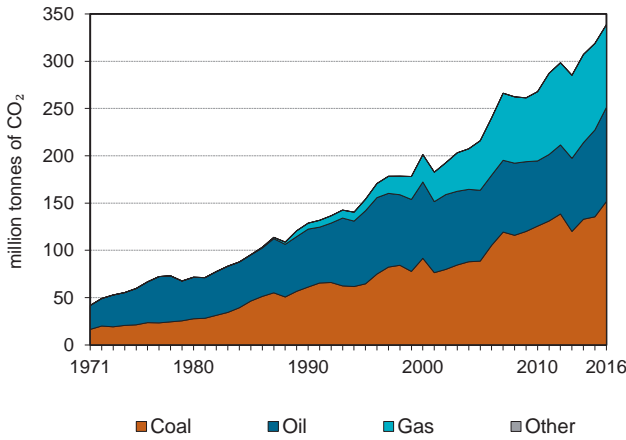


Figure 2. CO₂ emissions by sector

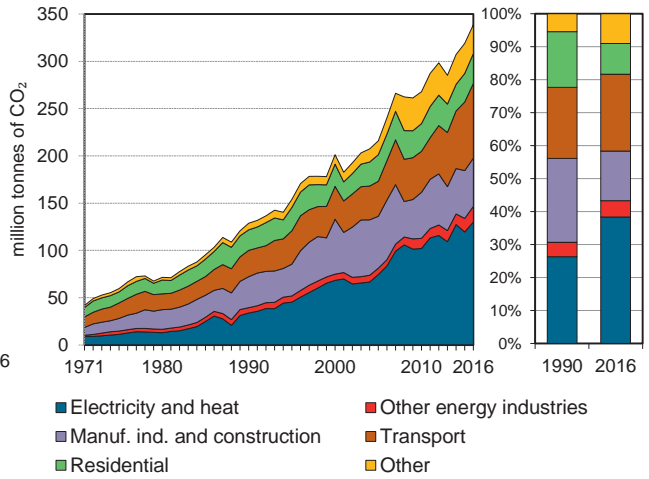


Figure 3. Electricity generation by fuel

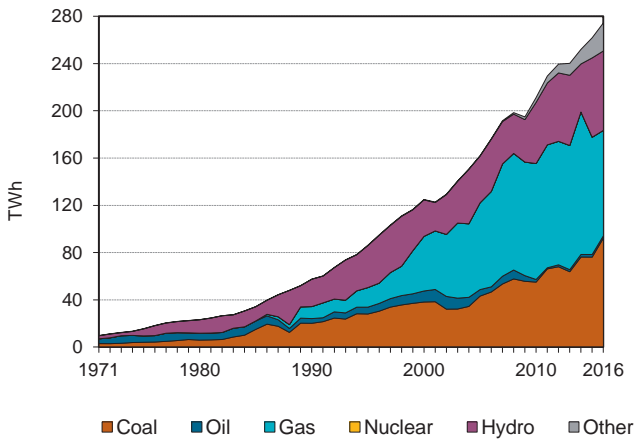


Figure 4. CO₂ from electricity generation: driving factors¹

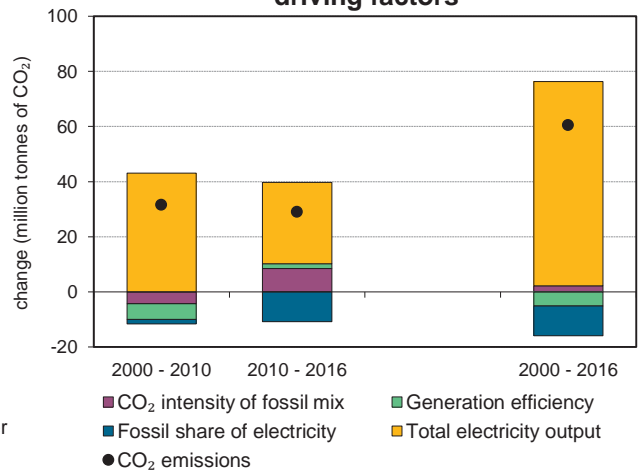


Figure 5. Changes in selected indicators

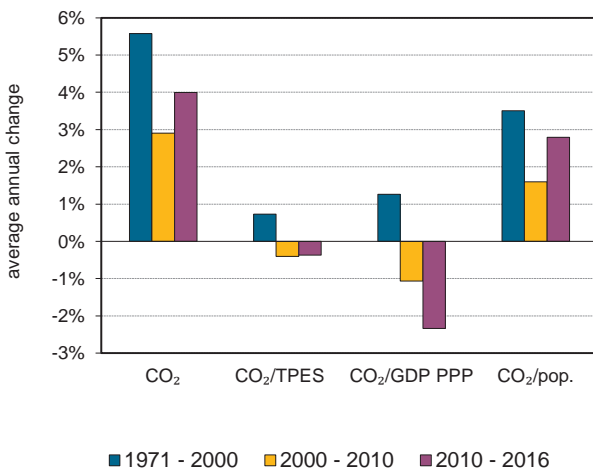
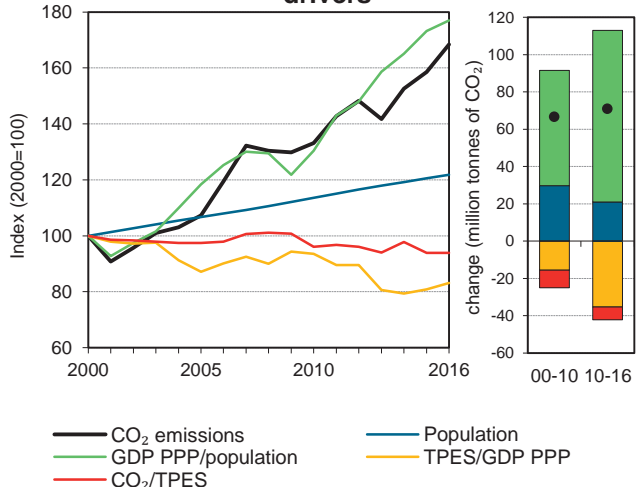


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Turkey

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	128.8	154.0	201.2	215.9	267.8	319.0	338.8	163%
Share of World CO ₂ from fuel combustion	0.6%	0.7%	0.9%	0.8%	0.9%	1.0%	1.1%	
TPES (PJ)	2154	2 550	3 194	3 517	4 426	5 393	5 724	166%
GDP (billion 2010 USD)	364	426.3	520.9	658.1	771.9	1 087.8	1 122.5	208%
GDP PPP (billion 2010 USD)	595.4	697.4	852.2	1 076.7	1 262.8	1 779.7	1 836.4	208%
Population (millions)	55.1	59.8	64.3	68.6	73.0	77.4	78.2	42%
CO ₂ / TPES (tCO ₂ per TJ)	59.8	60.4	63.0	61.4	60.5	59.2	59.2	-1%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.35	0.4	0.4	0.3	0.3	0.3	0.3	-15%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.22	0.2	0.2	0.2	0.2	0.2	0.2	-15%
CO ₂ / population (tCO ₂ per capita)	2.3	2.6	3.1	3.1	3.7	4.1	4.3	85%
Share of electricity output from fossil fuels	60%	58%	75%	75%	74%	68%	67%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	588	525	539	446	468	446	465	-21%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	120	156	168	208	248	263	163%
Population index	100	108	117	124	132	140	142	42%
GDP PPP per population index	100	108	123	145	160	213	217	117%
Energy intensity index - TPES / GDP PPP	100	101	104	90	97	84	86	-14%
Carbon intensity index - CO ₂ / TPES	100	101	105	103	101	99	99	-1%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	151.7	99.5	87.3	0.3	338.8	163%
Electricity and heat generation	93.9	1.3	34.5	0.3	130.0	284%
Other energy industry own use	6.2	7.1	3.2	-	16.5	194%
Manufacturing industries and construction	28.4	2.5	20.1	-	51.1	56%
Transport	-	78.3	0.8	-	79.0	184%
<i>of which: road</i>	-	72.9	0.2	-	73.0	187%
Other	23.2	10.3	28.7	-	62.1	116%
<i>of which: residential</i>	8.4	0.7	22.5	-	31.5	45%
<i>of which: services</i>	14.8	1.8	6.0	-	22.5	+
<i>Memo: international marine bunkers</i>	-	2.8	-	-	2.8	637%
<i>Memo: international aviation bunkers</i>	-	10.3	-	-	10.3	+

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	82.2	21.6	17.0	17.0
Road - oil	72.9	25.4	15.1	32.2
Main activity prod. elec. and heat - gas	29.1	5.0	6.0	38.2
Manufacturing industries - coal	28.4	20.2	5.9	44.1
Residential - gas	22.5	0.1	4.7	48.7
Manufacturing industries - gas	20.1	1.2	4.2	52.9
Non-specified other sectors - coal	14.8	1.1	3.1	56.0
Unallocated autoproducers - coal	11.7	3.7	2.4	58.4
Non-specified other - oil	9.6	5.9	2.0	60.4
<i>Memo: total CO₂ from fuel combustion</i>	<i>338.8</i>	<i>128.8</i>	<i>70.3</i>	<i>70.3</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Turkmenistan

Figure 1. CO₂ emissions by fuel

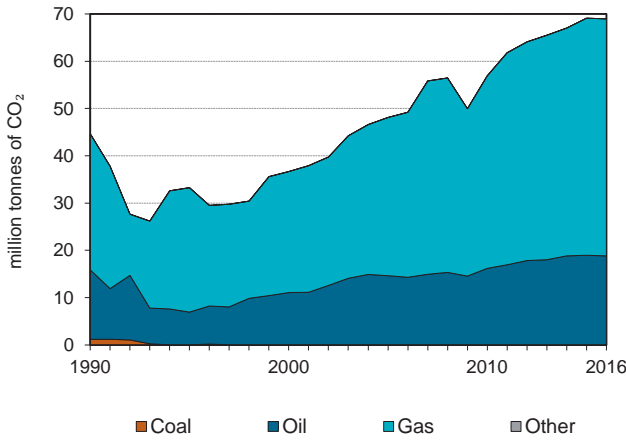


Figure 2. CO₂ emissions by sector

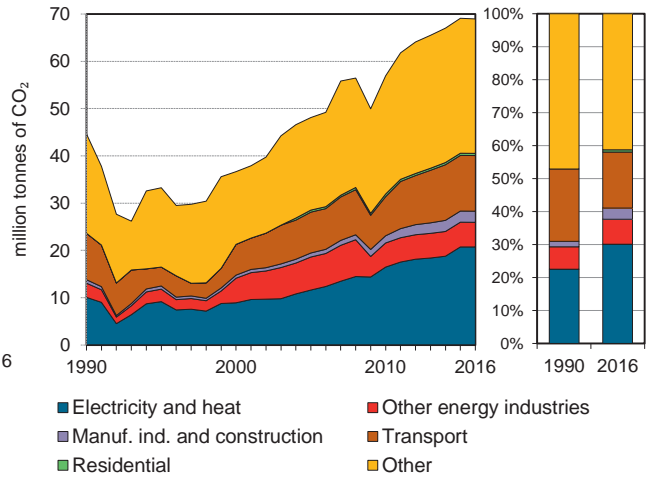


Figure 3. Electricity generation by fuel

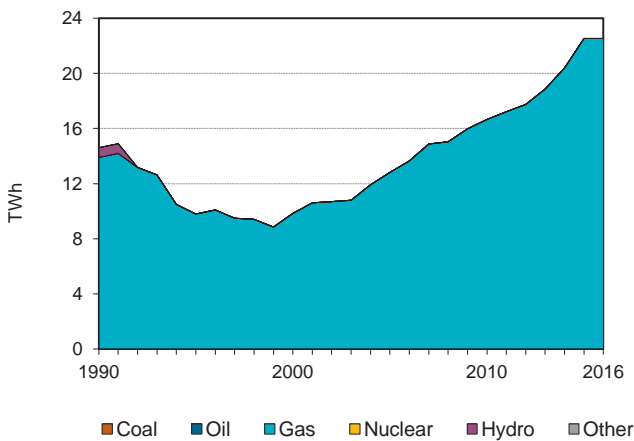


Figure 4. CO₂ from electricity generation: driving factors¹

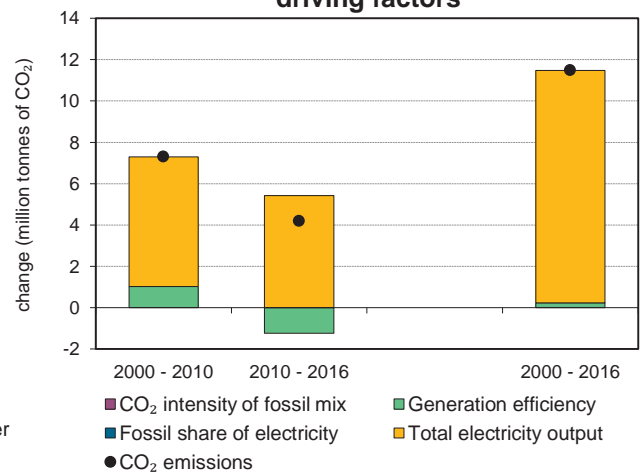


Figure 5. Changes in selected indicators

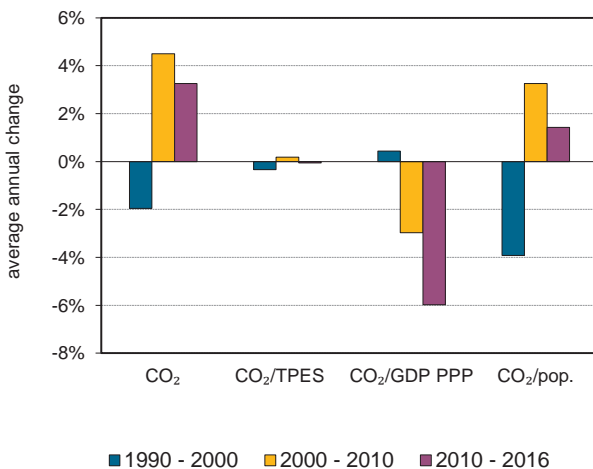
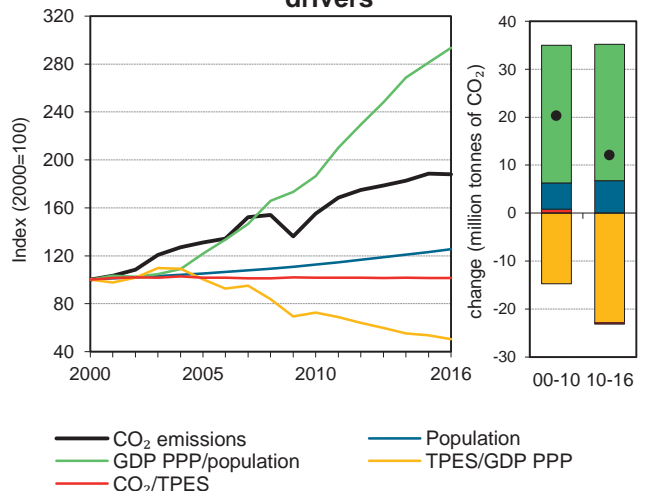


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Turkmenistan

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	44.7	33.3	36.7	48.1	56.9	69.1	69.0	54%
Share of World CO ₂ from fuel combustion	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	
TPES (PJ)	734	573	623	803	950	1 157	1 155	57%
GDP (billion 2010 USD)	13.7	8.6	10.8	13.8	22.6	37.3	39.6	189%
GDP PPP (billion 2010 USD)	30	19.0	23.6	30.3	49.6	81.7	86.8	189%
Population (millions)	3.7	4.2	4.5	4.8	5.1	5.6	5.7	54%
CO ₂ / TPES (tCO ₂ per TJ)	60.9	58.0	58.8	59.9	59.9	59.7	59.7	-2%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	3.26	3.8	3.4	3.5	2.5	1.9	1.7	-47%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	1.49	1.8	1.6	1.6	1.1	0.8	0.8	-47%
CO ₂ / population (tCO ₂ per capita)	12.1	7.9	8.1	10.1	11.2	12.4	12.2	0%
Share of electricity output from fossil fuels	95%	100%	100%	100%	100%	100%	100%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	689	936	876	876	959	893	893	30%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	74	82	108	127	155	154	54%
Population index	100	114	123	129	138	151	154	54%
GDP PPP per population index	100	55	64	78	120	180	188	88%
Energy intensity index - TPES / GDP PPP	100	124	108	109	78	58	54	-46%
Carbon intensity index - CO ₂ / TPES	100	95	97	98	98	98	98	-2%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	18.8	50.1	-	69.0	54%
Electricity and heat generation	-	-	20.7	-	20.7	106%
Other energy industry own use	-	0.3	4.9	-	5.2	74%
Manufacturing industries and construction	-	-	2.4	-	2.4	221%
Transport	-	7.9	3.9	-	11.8	20%
<i>of which: road</i>	-	7.9	-	-	7.9	91%
Other	-	10.6	18.3	-	28.9	38%
<i>of which: residential</i>	-	0.5	-	-	0.5	x
<i>of which: services</i>	-	-	16.8	-	16.8	95%
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	1.4	-	-	1.4	90%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - gas	20.7	10.1	16.7	16.7
Non-specified other - gas	18.3	9.4	14.8	31.5
Non-specified other - oil	10.1	10.4	8.2	39.7
Road - oil	7.9	4.1	6.3	46.0
Other energy industry own use - gas	4.9	2.9	3.9	49.9
Other transport - gas	3.9	5.7	3.1	53.1
Manufacturing industries - gas	2.4	0.7	1.9	55.0
Residential - oil	0.5	-	0.4	55.3
Other energy industry own use - oil	0.3	0.1	0.3	55.6
<i>Memo: total CO₂ from fuel combustion</i>	<i>69.0</i>	<i>44.7</i>	<i>55.6</i>	<i>55.6</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Ukraine

Figure 1. CO₂ emissions by fuel

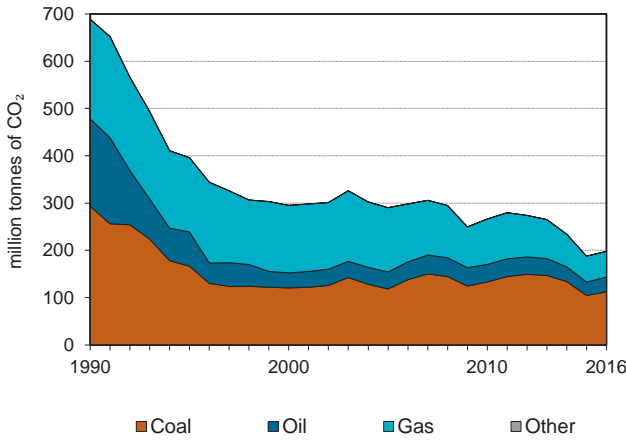


Figure 2. CO₂ emissions by sector

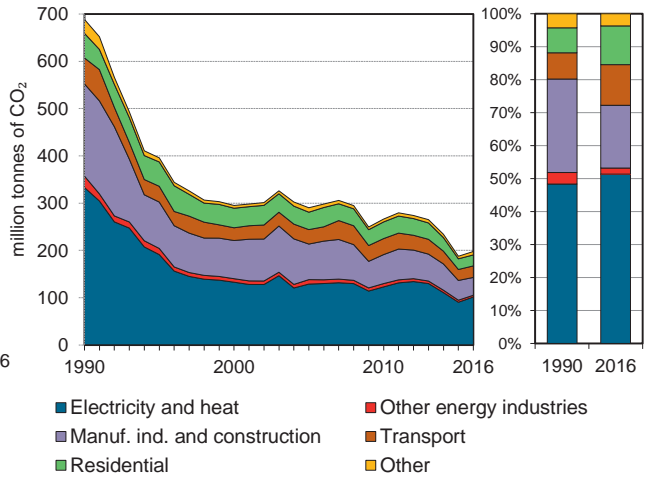


Figure 3. Electricity generation by fuel

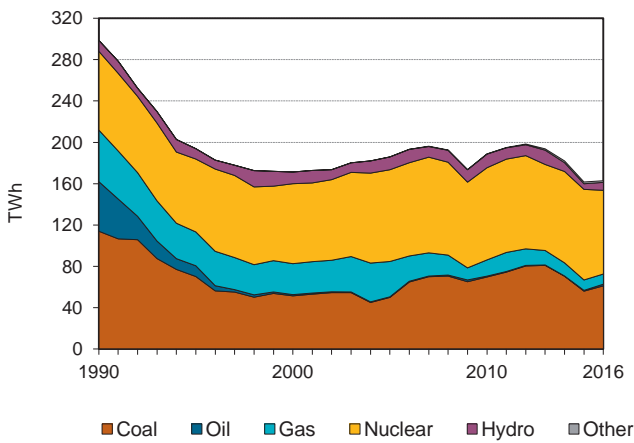


Figure 4. CO₂ from electricity generation: driving factors¹

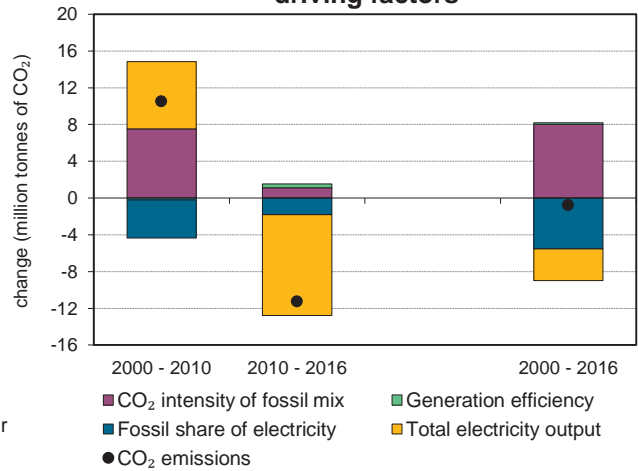


Figure 5. Changes in selected indicators

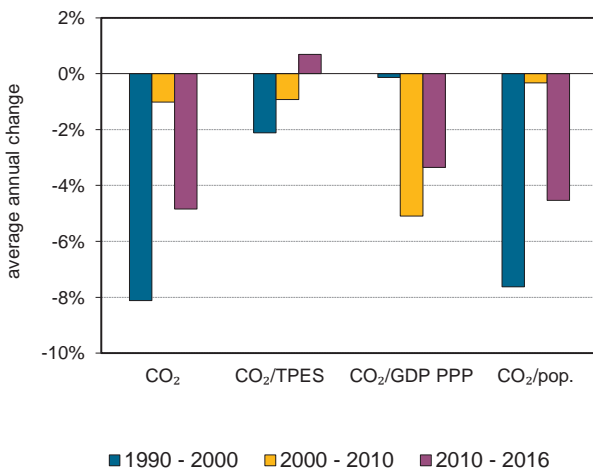
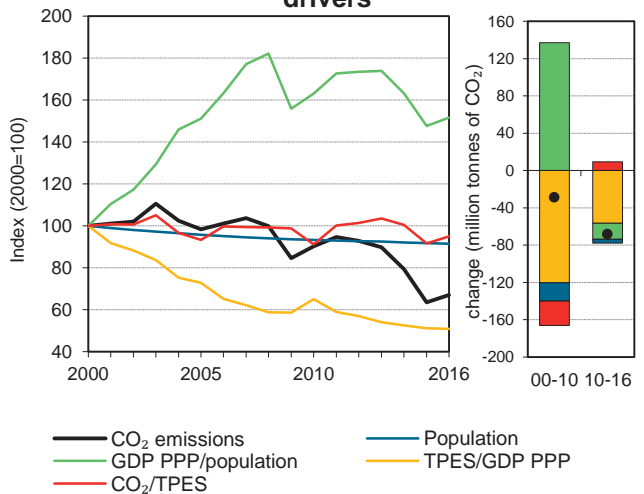


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Ukraine

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	688.6	395.8	295.1	290.2	266.3	187.6	197.7	-71%
Share of World CO ₂ from fuel combustion	3.4%	1.9%	1.3%	1.1%	0.9%	0.6%	0.6%	
TPES (PJ)	10552	6 854	5 602	5 907	5 545	3 889	3 952	-63%
GDP (billion 2010 USD)	205.8	98.8	89.4	129.4	136.0	121.2	124.0	-40%
GDP PPP (billion 2010 USD)	532	255.4	231.1	334.4	351.7	313.4	320.6	-40%
Population (millions)	51.9	51.5	49.2	47.1	45.9	45.2	45.0	-13%
CO ₂ / TPES (tCO ₂ per TJ)	65.3	57.8	52.7	49.1	48.0	48.2	50.0	-23%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	3.35	4.0	3.3	2.2	2.0	1.5	1.6	-52%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	1.29	1.6	1.3	0.9	0.8	0.6	0.6	-52%
CO ₂ / population (tCO ₂ per capita)	13.3	7.7	6.0	6.2	5.8	4.2	4.4	-67%
Share of electricity output from fossil fuels	71%	59%	48%	46%	46%	41%	45%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	664	576	407	409	425	397	423	-36%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	57	43	42	39	27	29	-71%
Population index	100	99	95	91	88	87	87	-13%
GDP PPP per population index	100	48	46	69	75	68	69	-31%
Energy intensity index - TPES / GDP PPP	100	135	122	89	80	63	62	-38%
Carbon intensity index - CO ₂ / TPES	100	88	81	75	74	74	77	-23%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16	
CO₂ fuel combustion	112.2		31.2	54.4		197.7	-71%
Electricity and heat generation	77.5		4.3	19.7		101.4	-70%
Other energy industry own use	1.6		0.1	2.1		3.8	-84%
Manufacturing industries and construction	31.3		0.5	5.8		37.6	-81%
Transport	0.0		21.1	3.3		24.4	-56%
<i>of which: road</i>	-		20.6	0.1		20.6	-56%
Other	1.8		5.1	23.5		30.4	-63%
<i>of which: residential</i>	1.1		0.3	21.8		23.2	-55%
<i>of which: services</i>	0.6		0.3	1.4		2.3	-18%
<i>Memo: international marine bunkers</i>	-		-	-		-	-
<i>Memo: international aviation bunkers</i>	-		0.5	-		0.5	-92%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	69.2	138.8	19.4	19.4
Manufacturing industries - coal	31.3	112.1	8.8	28.2
Residential - gas	21.8	20.5	6.1	34.3
Road - oil	20.6	47.4	5.8	40.1
Main activity prod. elec. and heat - gas	15.3	93.4	4.3	44.4
Unallocated autoproducers - coal	8.3	2.3	2.3	46.7
Manufacturing industries - gas	5.8	54.7	1.6	48.3
Non-specified other - oil	4.8	18.2	1.4	49.7
Unallocated autoproducers - gas	4.4	29.1	1.2	50.9
<i>Memo: total CO₂ from fuel combustion</i>	<i>197.7</i>	<i>688.6</i>	<i>55.5</i>	<i>55.5</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

United Arab Emirates

Figure 1. CO₂ emissions by fuel

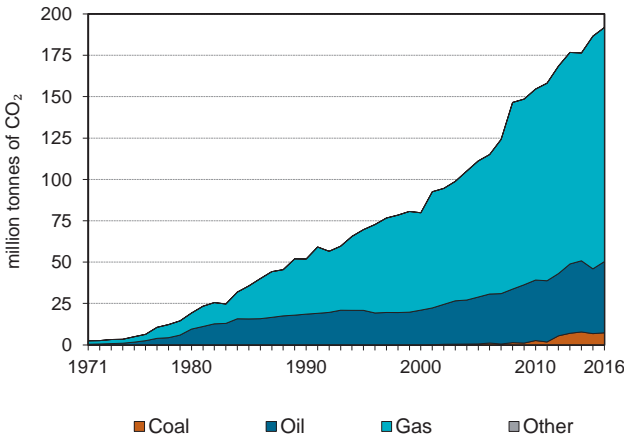


Figure 2. CO₂ emissions by sector

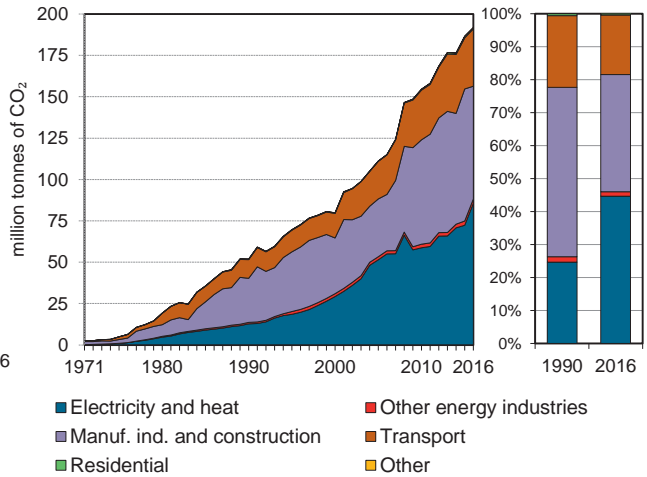


Figure 3. Electricity generation by fuel

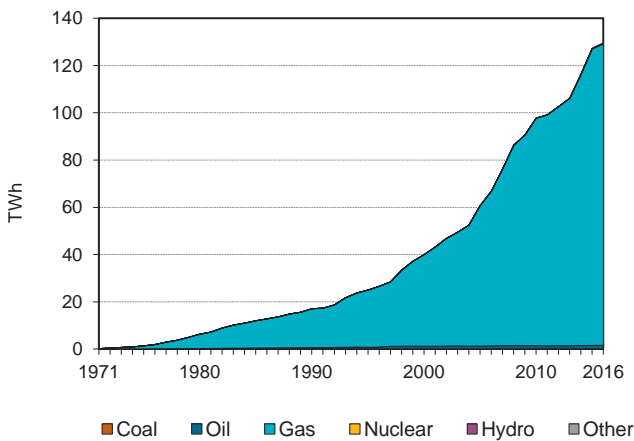


Figure 4. CO₂ from electricity generation: driving factors¹

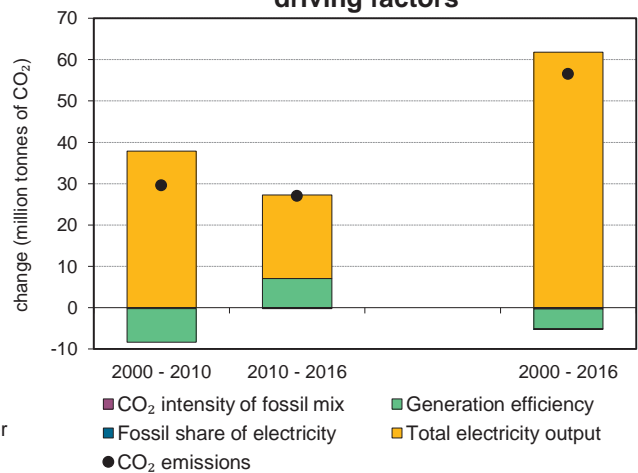


Figure 5. Changes in selected indicators

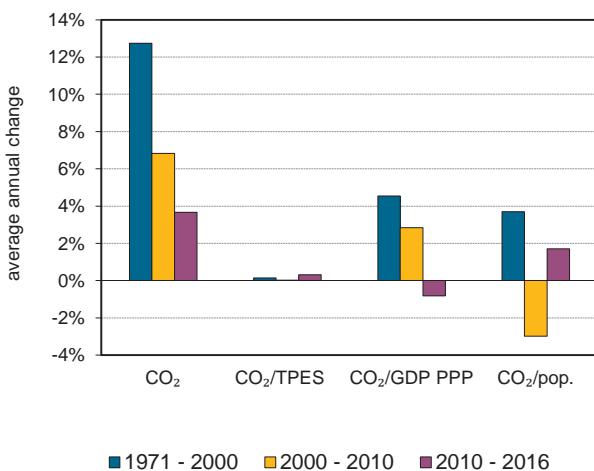
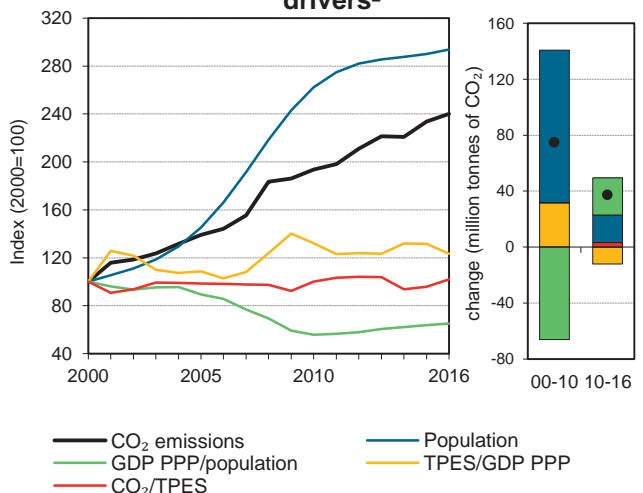


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

United Arab Emirates

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	51.9	69.7	79.9	111.1	154.6	186.6	191.8	270%
Share of World CO ₂ from fuel combustion	0.3%	0.3%	0.3%	0.4%	0.5%	0.6%	0.6%	
TPES (PJ)	855	1 159	1 320	1 863	2 554	3 221	3 110	264%
GDP (billion 2010 USD)	125.8	151.4	198.2	257.4	289.9	367.6	378.8	201%
GDP PPP (billion 2010 USD)	202.4	243.7	319.1	414.3	466.6	591.7	609.7	201%
Population (millions)	1.9	2.4	3.2	4.6	8.3	9.2	9.3	398%
CO ₂ / TPES (tCO ₂ per TJ)	60.7	60.1	60.5	59.6	60.5	57.9	61.7	2%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.41	0.5	0.4	0.4	0.5	0.5	0.5	23%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.26	0.3	0.3	0.3	0.3	0.3	0.3	23%
CO ₂ / population (tCO ₂ per capita)	27.9	28.4	25.3	24.3	18.7	20.4	20.7	-26%
Share of electricity output from fossil fuels	100%	100%	100%	100%	100%	100%	100%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	748	742	732	848	601	568	661	-12%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	134	154	214	298	360	370	270%
Population index	100	132	170	246	445	492	498	398%
GDP PPP per population index	100	91	93	83	52	59	60	-40%
Energy intensity index - TPES / GDP PPP	100	113	98	106	130	129	121	21%
Carbon intensity index - CO ₂ / TPES	100	99	100	98	100	95	102	2%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	7.3	43.1	141.5	-	191.8	270%
Electricity and heat generation	-	1.9	83.7	-	85.6	571%
Other energy industry own use	-	1.2	1.4	-	2.6	195%
Manufacturing industries and construction	7.3	4.6	56.3	-	68.2	156%
Transport	-	34.6	-	-	34.6	207%
<i>of which: road</i>	-	33.6	-	-	33.6	198%
Other	-	0.8	-	-	0.8	153%
<i>of which: residential</i>	-	0.8	-	-	0.8	153%
<i>of which: services</i>	-	-	-	-	-	-
<i>Memo: international marine bunkers</i>	-	52.2	-	-	52.2	172%
<i>Memo: international aviation bunkers</i>	-	26.4	-	-	26.4	167%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - gas	83.7	12.1	34.0	34.0
Manufacturing industries - gas	56.3	20.5	22.9	56.9
Road - oil	33.6	11.3	13.7	70.6
Manufacturing industries - coal	7.3	-	3.0	73.6
Manufacturing industries - oil	4.6	6.1	1.9	75.4
Main activity prod. elec. and heat - oil	1.9	0.6	0.8	76.2
Other energy industry own use - gas	1.4	0.6	0.6	76.8
Other energy industry own use - oil	1.2	0.3	0.5	77.3
Other transport - oil	1.0	-	0.4	77.7
<i>Memo: total CO₂ from fuel combustion</i>	<i>191.8</i>	<i>51.9</i>	<i>78.0</i>	<i>78.0</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

United Kingdom

Figure 1. CO₂ emissions by fuel

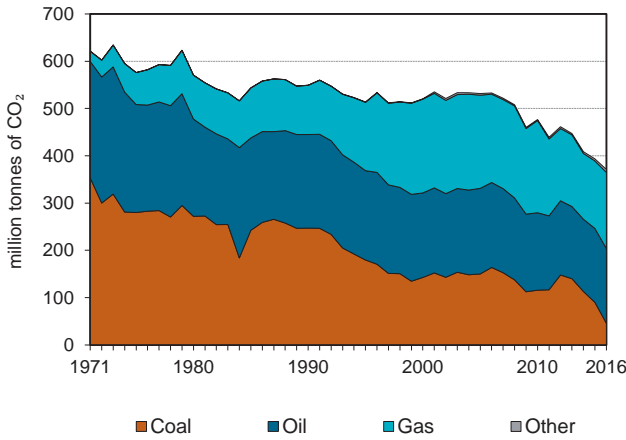


Figure 2. CO₂ emissions by sector

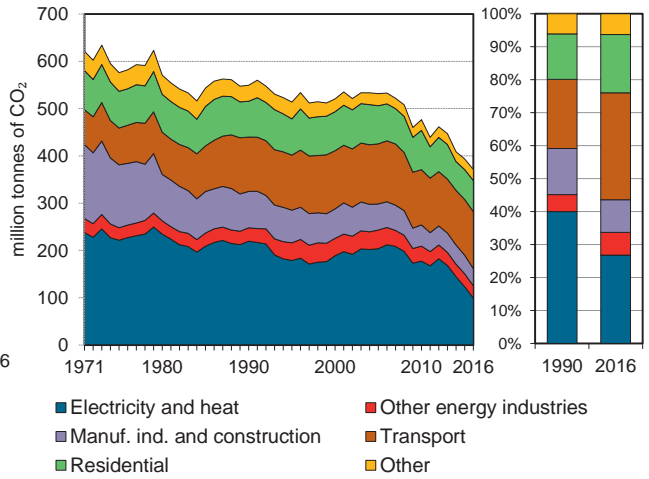


Figure 3. Electricity generation by fuel

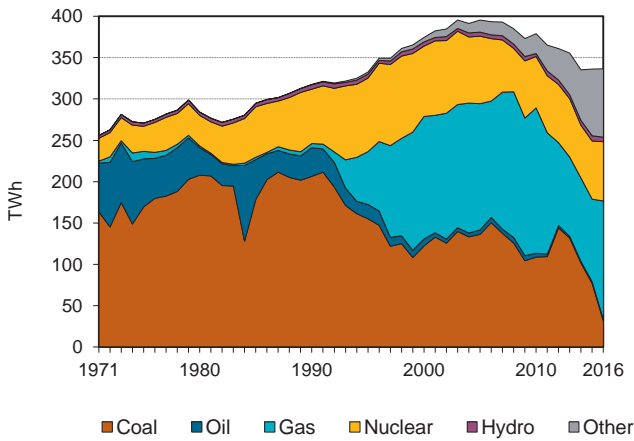


Figure 4. CO₂ from electricity generation: driving factors¹

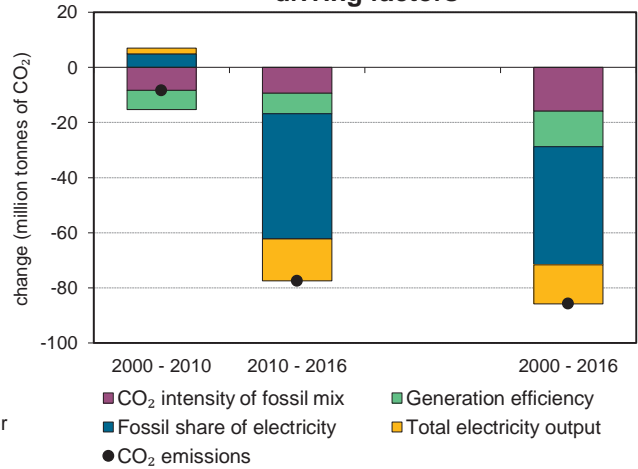


Figure 5. Changes in selected indicators

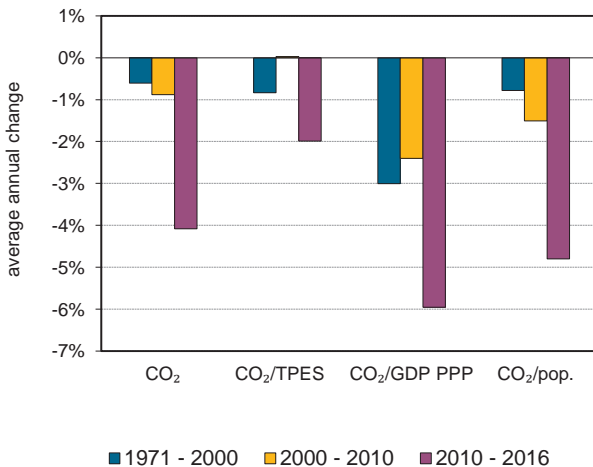
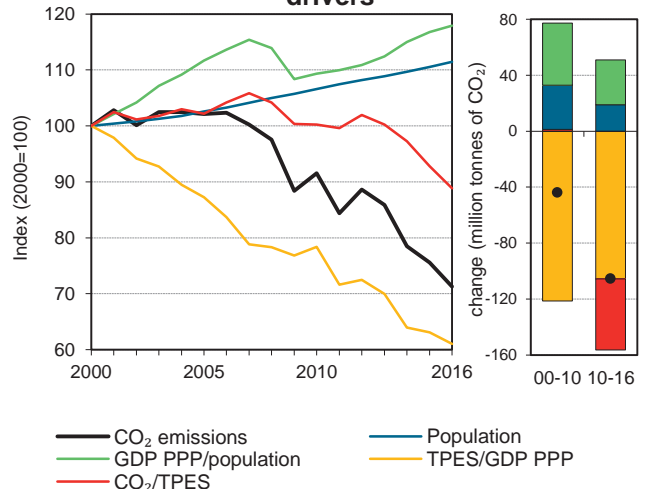


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

United Kingdom

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	549.4	513.8	520.6	531.6	476.6	393.5	371.1	-32%
Share of World CO ₂ from fuel combustion	2.7%	2.4%	2.2%	2.0%	1.6%	1.2%	1.2%	
TPES (PJ)	8622	9 060	9 336	9 330	8 527	7 604	7 490	-13%
GDP (billion 2010 USD)	1642.5	1 779.7	2 095.2	2 400.4	2 441.2	2 705.3	2 757.6	68%
GDP PPP (billion 2010 USD)	1516.5	1 643.2	1 934.5	2 216.3	2 253.9	2 497.8	2 543.7	68%
Population (millions)	57.2	58.0	58.9	60.4	62.8	65.1	65.6	15%
CO ₂ / TPES (tCO ₂ per TJ)	63.7	56.7	55.8	57.0	55.9	51.7	49.6	-22%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.33	0.3	0.2	0.2	0.2	0.1	0.1	-60%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.36	0.3	0.3	0.2	0.2	0.2	0.1	-60%
CO ₂ / population (tCO ₂ per capita)	9.6	8.9	8.8	8.8	7.6	6.0	5.7	-41%
Share of electricity output from fossil fuels	78%	71%	75%	75%	77%	54%	54%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	691	538	480	501	452	350	278	-60%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	94	95	97	87	72	68	-32%
Population index	100	101	103	106	110	114	115	15%
GDP PPP per population index	100	107	124	138	136	145	146	46%
Energy intensity index - TPES / GDP PPP	100	97	85	74	67	54	52	-48%
Carbon intensity index - CO ₂ / TPES	100	89	88	89	88	81	78	-22%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	45.7	158.2	161.1	6.0	371.1	-32%
Electricity and heat generation	33.2	1.7	58.9	5.6	99.4	-55%
Other energy industry own use	3.5	11.8	10.5	-	25.8	-9%
Manufacturing industries and construction	6.7	11.6	17.8	0.3	36.4	-53%
Transport	0.0	120.4	-	-	120.5	5%
<i>of which: road</i>	-	114.5	-	-	114.5	6%
Other	2.3	12.7	73.9	0.1	89.1	-19%
<i>of which: residential</i>	2.2	7.0	56.6	-	65.8	-13%
<i>of which: services</i>	0.1	3.5	15.2	0.1	18.9	-5%
<i>Memo: international marine bunkers</i>	-	8.3	-	-	8.3	5%
<i>Memo: international aviation bunkers</i>	-	32.7	-	-	32.7	72%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	114.5	107.8	24.1	24.1
Residential - gas	56.6	54.6	11.9	36.1
Main activity prod. elec. and heat - gas ***	47.4	-	10.0	46.1
Main activity prod. elec. and heat - coal	27.2	185.5	5.7	51.8
Manufacturing industries - gas	17.8	24.4	3.8	55.6
Non-specified other - gas	17.3	15.5	3.6	59.2
Other energy industry own use - oil	11.8	18.9	2.5	61.7
Manufacturing industries - oil	11.6	19.6	2.4	64.2
Unallocated autoproducers - gas ***	11.5	2.6	2.4	66.6
<i>Memo: total CO₂ from fuel combustion</i>	<i>371.1</i>	<i>549.4</i>	<i>78.3</i>	<i>78.3</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

United States

Figure 1. CO₂ emissions by fuel

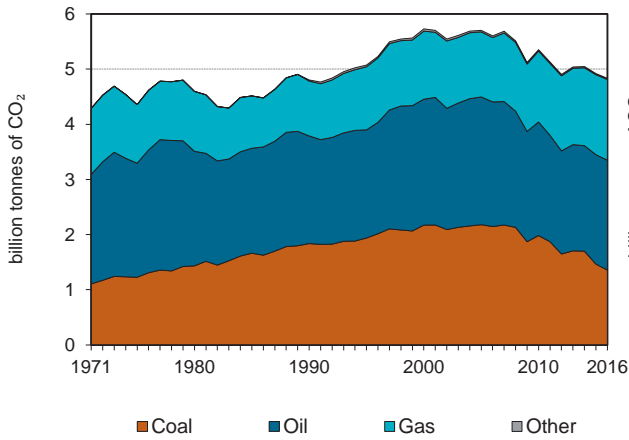


Figure 2. CO₂ emissions by sector

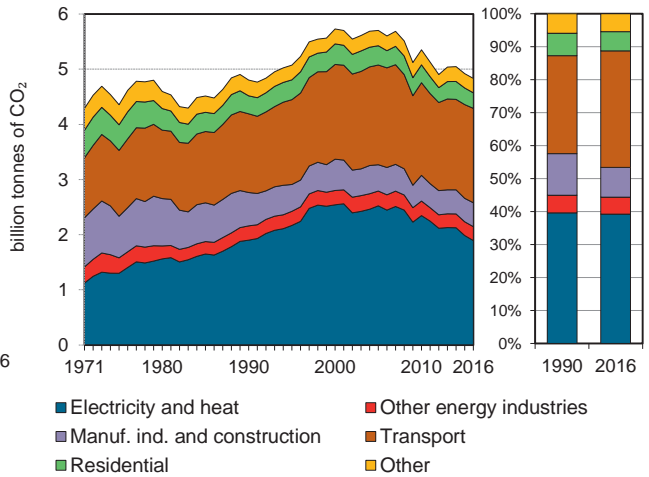


Figure 3. Electricity generation by fuel

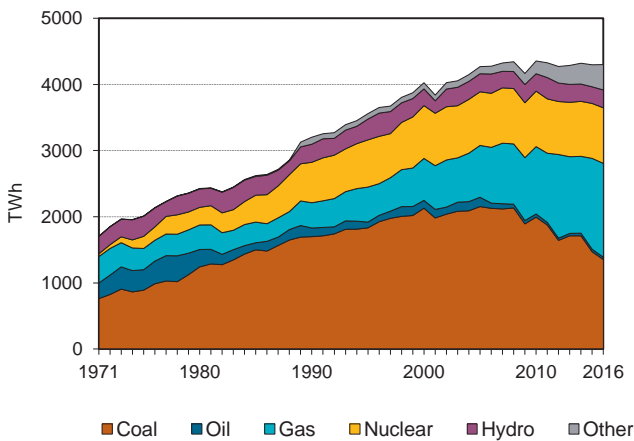


Figure 4. CO₂ from electricity generation: driving factors¹

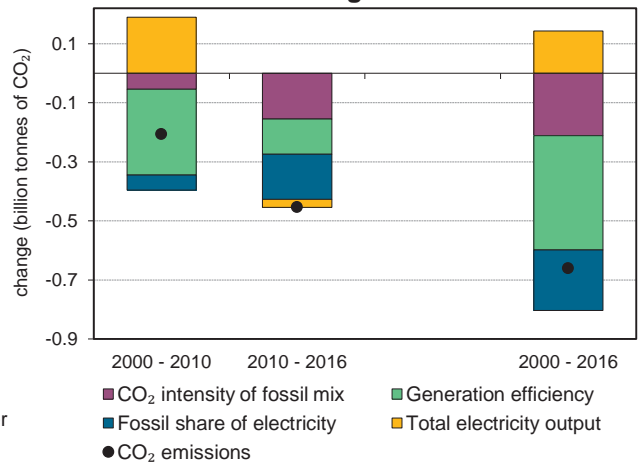


Figure 5. Changes in selected indicators

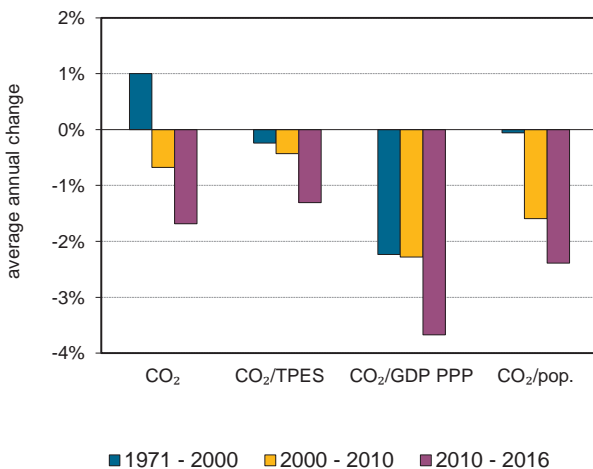
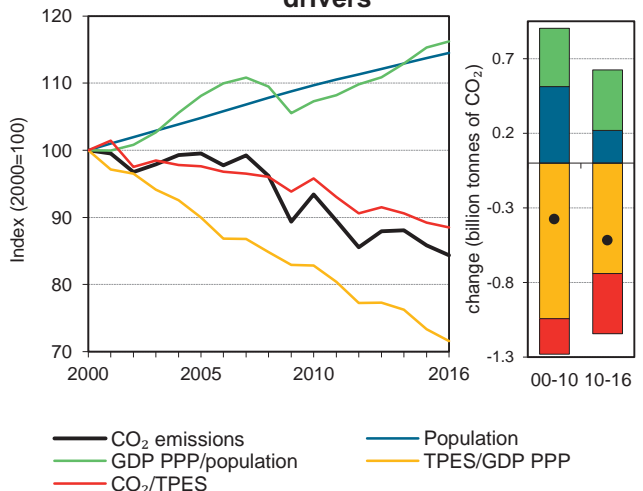


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

United States

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	4803.1	5 073.9	5 729.9	5 703.2	5 352.1	4 919.6	4 833.1	1%
Share of World CO ₂ from fuel combustion	23.4%	23.7%	24.7%	21.1%	17.6%	15.2%	15.0%	
TPES (PJ)	80178	86 554	95 199	97 089	92 817	91 593	90 712	13%
GDP (billion 2010 USD)	9064.4	10 299.0	12 713.1	14 408.1	14 964.4	16 672.7	16 920.3	87%
GDP PPP (billion 2010 USD)	9064.4	10 299.0	12 713.1	14 408.1	14 964.4	16 672.7	16 920.3	87%
Population (millions)	250.2	266.6	282.4	296.0	309.8	321.2	323.4	29%
CO ₂ / TPES (tCO ₂ per TJ)	59.9	58.6	60.2	58.7	57.7	53.7	53.3	-11%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.53	0.5	0.5	0.4	0.4	0.3	0.3	-46%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.53	0.5	0.5	0.4	0.4	0.3	0.3	-46%
CO ₂ / population (tCO ₂ per capita)	19.2	19.0	20.3	19.3	17.3	15.3	14.9	-22%
Share of electricity output from fossil fuels	69%	69%	72%	72%	71%	67%	66%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	593	601	626	586	531	456	433	-27%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	106	119	119	111	102	101	1%
Population index	100	107	113	118	124	128	129	29%
GDP PPP per population index	100	107	124	134	133	143	144	44%
Energy intensity index - TPES / GDP PPP	100	95	85	76	70	62	61	-39%
Carbon intensity index - CO ₂ / TPES	100	98	100	98	96	90	89	-11%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	1 356.1	1 992.4	1 464.5	20.1	4 833.1	1%
Electricity and heat generation	1 269.8	25.5	581.9	16.5	1 893.7	-0%
Other energy industry own use	6.9	107.8	137.1	-	251.9	-3%
Manufacturing industries and construction	77.2	64.1	289.6	2.7	433.6	-28%
Transport	-	1 670.4	40.8	-	1 711.2	20%
<i>of which: road</i>	-	1 444.8	2.3	-	1 447.1	26%
Other	2.1	124.6	415.1	0.9	542.7	-11%
<i>of which: residential</i>	-	41.8	240.0	-	281.8	-14%
<i>of which: services</i>	2.1	40.1	171.6	0.9	214.7	-2%
<i>Memo: international marine bunkers</i>	-	53.9	-	-	53.9	-41%
<i>Memo: international aviation bunkers</i>	-	73.7	-	-	73.7	88%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	1444.8	1149.4	23.3	23.3
Main activity prod. elec. and heat - coal	1260.2	1564.5	20.3	43.6
Main activity prod. elec. and heat - gas	550.0	153.5	8.9	52.4
Manufacturing industries - gas	289.6	258.2	4.7	57.1
Residential - gas	240.0	241.0	3.9	61.0
Other transport - oil	225.5	241.4	3.6	64.6
Non-specified other - gas	175.1	143.9	2.8	67.4
Other energy industry own use - gas	137.1	104.8	2.2	69.6
Other energy industry own use - oil	107.8	151.9	1.7	71.4
<i>Memo: total CO₂ from fuel combustion</i>	<i>4833.1</i>	<i>4803.1</i>	<i>77.9</i>	<i>77.9</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Uruguay

Figure 1. CO₂ emissions by fuel

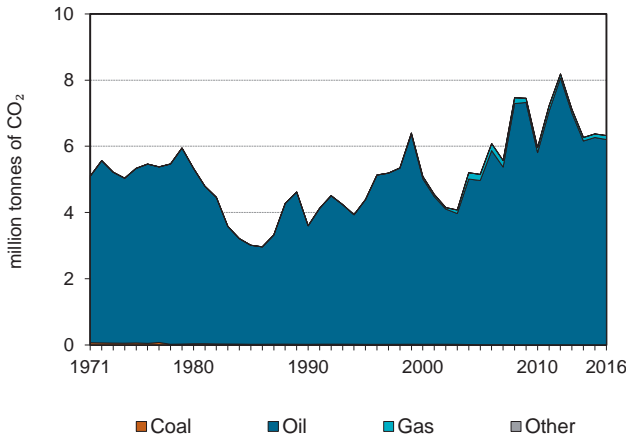


Figure 2. CO₂ emissions by sector

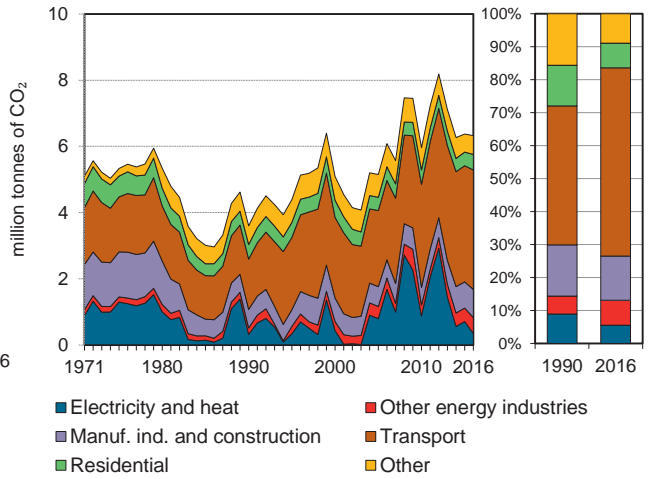


Figure 3. Electricity generation by fuel

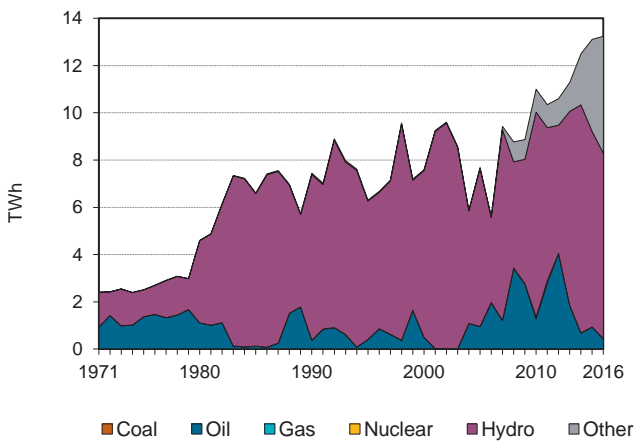


Figure 4. CO₂ from electricity generation: driving factors¹

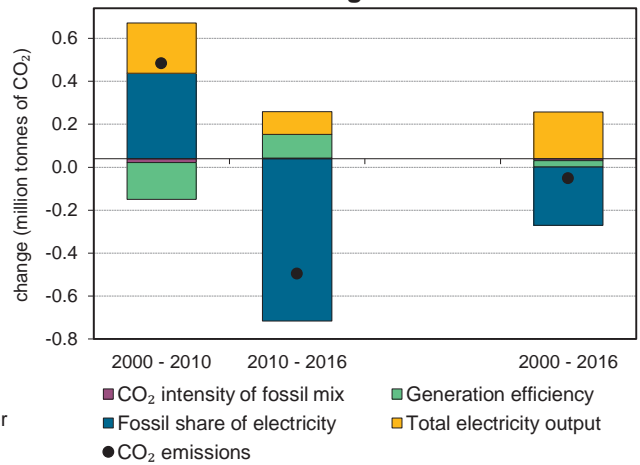


Figure 5. Changes in selected indicators

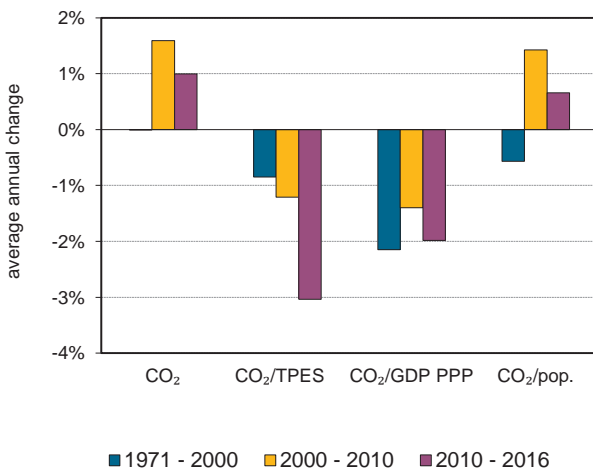
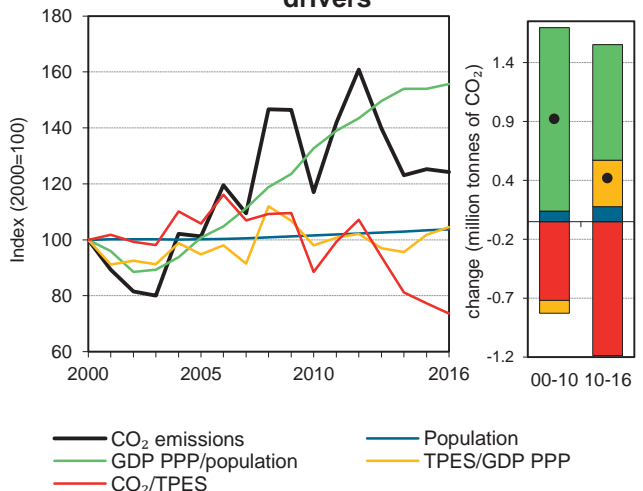


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Uruguay

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	3.6	4.4	5.1	5.2	6.0	6.4	6.3	76%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	94	108	129	124	171	210	219	132%
GDP (billion 2010 USD)	21.4	25.9	29.9	30.2	40.3	47.6	48.3	126%
GDP PPP (billion 2010 USD)	30	36.4	41.9	42.3	56.5	66.7	67.6	126%
Population (millions)	3.1	3.2	3.3	3.3	3.4	3.4	3.4	11%
CO ₂ / TPES (tCO ₂ per TJ)	38.2	40.8	39.3	41.6	34.8	30.4	28.9	-24%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.17	0.2	0.2	0.2	0.1	0.1	0.1	-22%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.12	0.1	0.1	0.1	0.1	0.1	0.1	-22%
CO ₂ / population (tCO ₂ per capita)	1.2	1.4	1.5	1.5	1.8	1.9	1.8	59%
Share of electricity output from fossil fuels	5%	7%	7%	13%	12%	7%	3%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	43	54	57	104	80	54	26	-39%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	122	141	143	166	177	176	76%
Population index	100	104	107	107	108	110	111	11%
GDP PPP per population index	100	117	131	132	174	202	204	104%
Energy intensity index - TPES / GDP PPP	100	94	98	93	96	100	103	3%
Carbon intensity index - CO ₂ / TPES	100	107	103	109	91	80	76	-24%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	-	6.2	0.1	-	6.3	76%
Electricity and heat generation	-	0.3	-	-	0.3	8%
Other energy industry own use	-	0.5	0.0	-	0.5	147%
Manufacturing industries and construction	-	0.8	0.0	-	0.8	52%
Transport	-	3.6	-	-	3.6	138%
<i>of which: road</i>	-	3.6	-	-	3.6	148%
Other	-	1.0	0.1	-	1.0	3%
<i>of which: residential</i>	-	0.4	0.1	-	0.5	6%
<i>of which: services</i>	-	0.1	0.0	-	0.1	-33%
<i>Memo: international marine bunkers</i>	-	0.5	-	-	0.5	23%
<i>Memo: international aviation bunkers</i>	-	0.3	-	-	0.3	x

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	3.6	1.4	7.3	7.3
Manufacturing industries - oil	0.8	0.6	1.7	9.0
Non-specified other - oil	0.5	0.6	1.1	10.1
Other energy industry own use - oil	0.5	0.2	1.0	11.0
Residential - oil	0.4	0.4	0.8	11.9
Main activity prod. elec. and heat - oil	0.3	0.3	0.7	12.6
Residential - gas	0.1	-	0.1	12.7
Manufacturing industries - gas	0.0	-	0.1	12.7
Non-specified other - gas	0.0	-	0.1	12.8
<i>Memo: total CO₂ from fuel combustion</i>	6.3	3.6	12.9	12.9

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Uzbekistan

Figure 1. CO₂ emissions by fuel

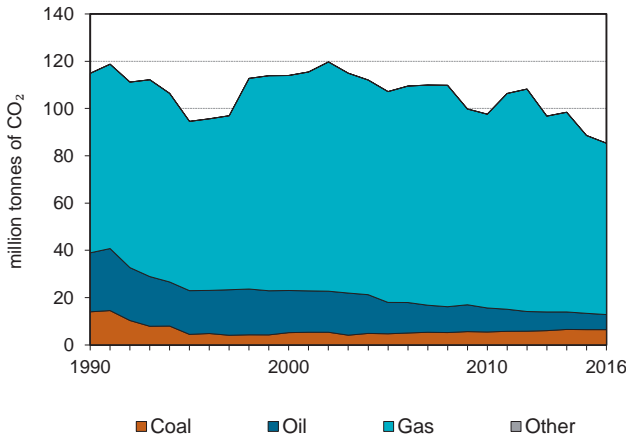


Figure 2. CO₂ emissions by sector

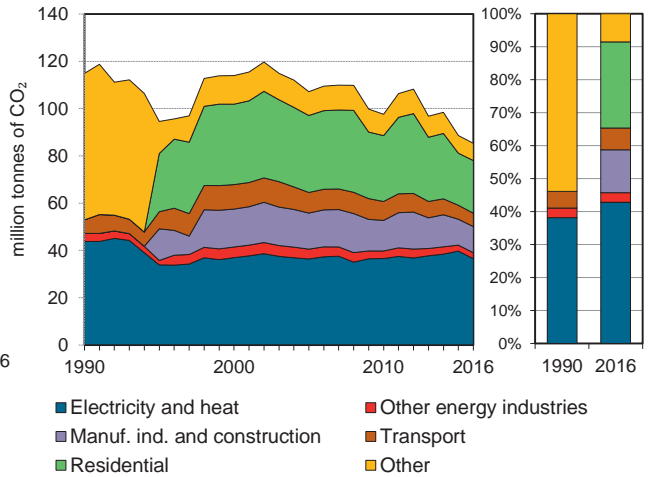


Figure 3. Electricity generation by fuel

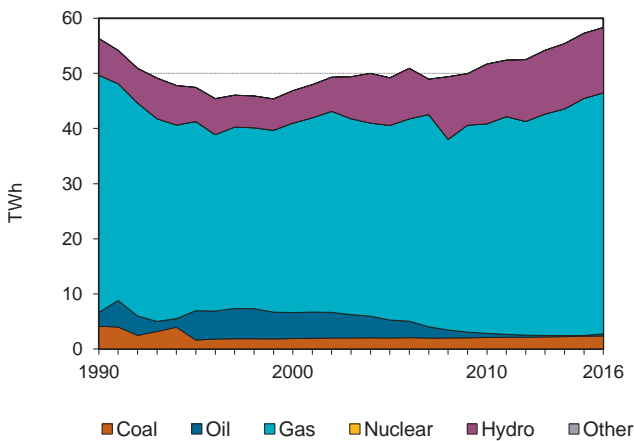


Figure 4. CO₂ from electricity generation: driving factors¹

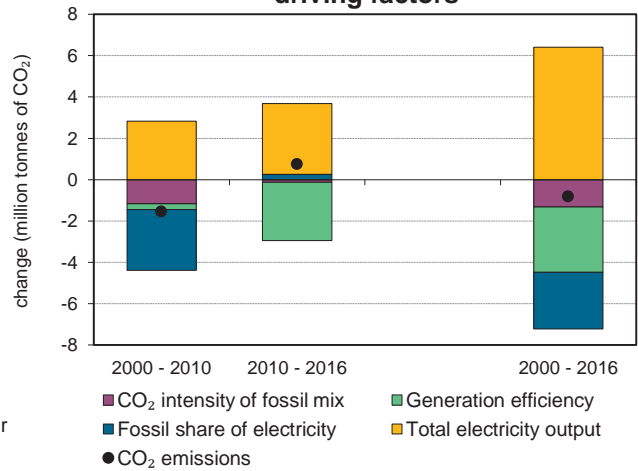


Figure 5. Changes in selected indicators

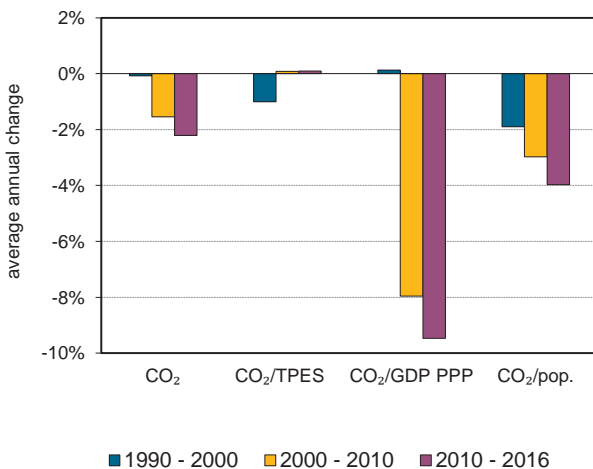
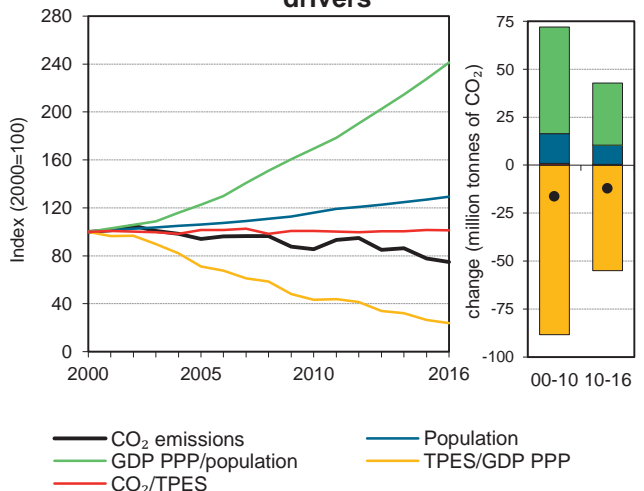


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Uzbekistan

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	114.9	94.6	114.0	107.2	97.6	88.6	85.3	-26%
Share of World CO ₂ from fuel combustion	0.6%	0.4%	0.5%	0.4%	0.3%	0.3%	0.3%	
TPES (PJ)	1942	1 790	2 130	1 972	1 810	1 631	1 574	-19%
GDP (billion 2010 USD)	20.5	16.6	20.0	26.1	39.3	57.9	62.5	205%
GDP PPP (billion 2010 USD)	61.7	50.1	60.5	78.7	118.6	174.8	188.4	205%
Population (millions)	20.5	22.8	24.7	26.2	28.6	31.3	31.8	55%
CO ₂ / TPES (tCO ₂ per TJ)	59.2	52.8	53.5	54.3	53.9	54.3	54.2	-8%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	5.62	5.7	5.7	4.1	2.5	1.5	1.4	-76%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	1.86	1.9	1.9	1.4	0.8	0.5	0.5	-76%
CO ₂ / population (tCO ₂ per capita)	5.6	4.2	4.6	4.1	3.4	2.8	2.7	-52%
Share of electricity output from fossil fuels	88%	87%	88%	83%	79%	79%	80%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	630	575	633	591	544	553	495	-21%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	82	99	93	85	77	74	-26%
Population index	100	111	120	128	139	153	155	55%
GDP PPP per population index	100	73	82	100	138	186	197	97%
Energy intensity index - TPES / GDP PPP	100	114	112	80	48	30	27	-73%
Carbon intensity index - CO ₂ / TPES	100	89	90	92	91	92	92	-8%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	6.4	6.4	72.5	-	85.3	-26%
Electricity and heat generation	4.4	0.3	31.8	-	36.5	-17%
Other energy industry own use	-	0.2	2.3	-	2.5	-26%
Manufacturing industries and construction	0.9	0.4	9.7	-	11.1	x
Transport	-	3.5	2.1	-	5.7	-1%
<i>of which: road</i>	-	3.1	0.1	-	3.2	-42%
Other	1.1	1.9	26.6	-	29.6	-52%
<i>of which: residential</i>	0.1	0.2	22.0	-	22.3	x
<i>of which: services</i>	-	-	4.4	-	4.4	x
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	-	-	-	-	-

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - gas	31.7	27.3	19.4	19.4
Residential - gas	22.0	-	13.4	32.9
Manufacturing industries - gas	9.7	-	5.9	38.8
Non-specified other - gas	4.6	46.2	2.8	41.7
Main activity prod. elec. and heat - coal	4.4	9.0	2.7	44.3
Road - oil	3.1	5.5	1.9	46.2
Other energy industry own use - gas	2.3	2.4	1.4	47.6
Other transport - gas	2.0	-	1.2	48.9
Non-specified other - oil	1.6	10.7	1.0	49.9
<i>Memo: total CO₂ from fuel combustion</i>	<i>85.3</i>	<i>114.9</i>	<i>52.3</i>	<i>52.3</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Bolivarian Republic of Venezuela

Figure 1. CO₂ emissions by fuel

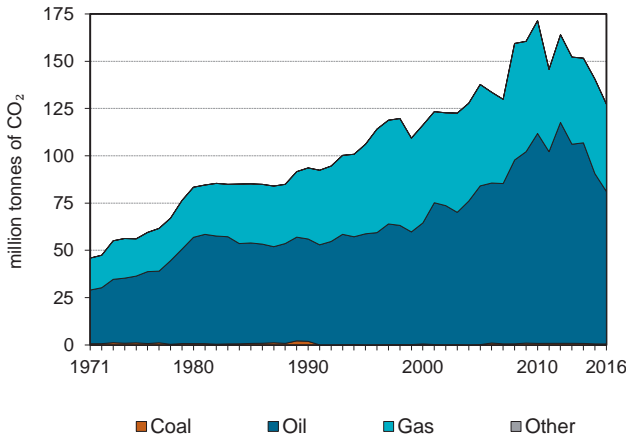


Figure 2. CO₂ emissions by sector

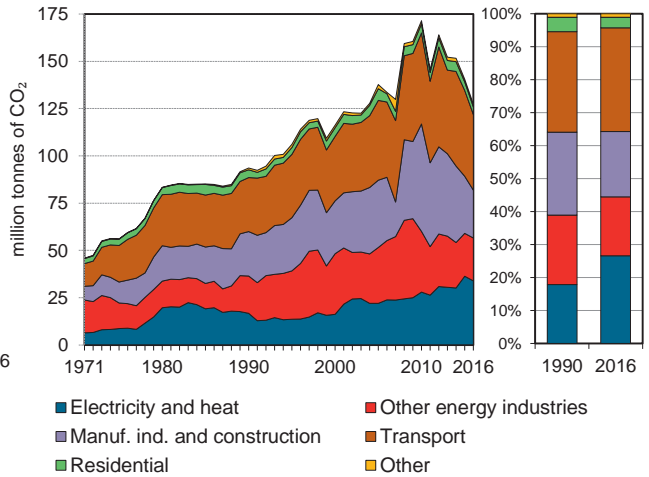


Figure 3. Electricity generation by fuel

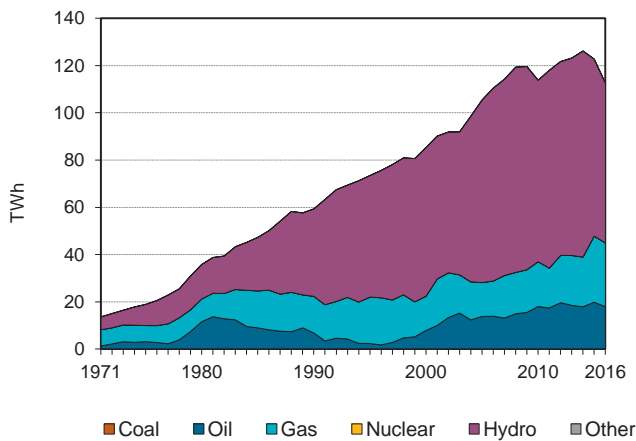


Figure 4. CO₂ from electricity generation: driving factors¹

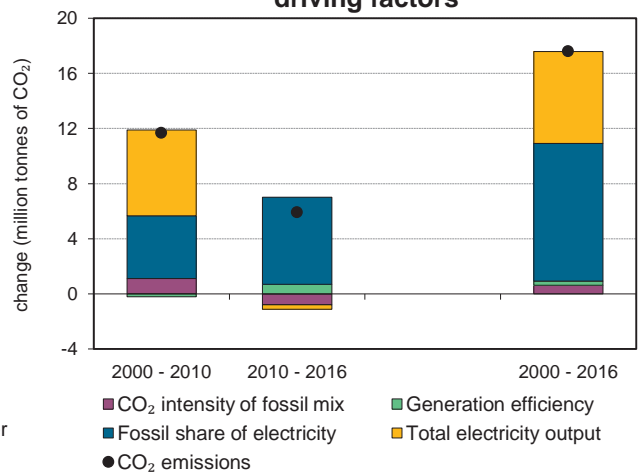


Figure 5. Changes in selected indicators

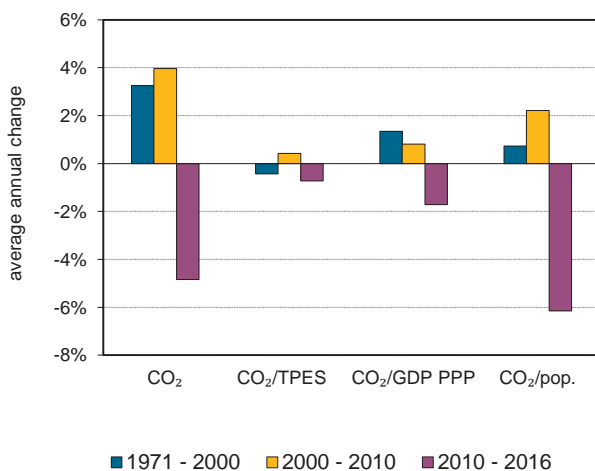
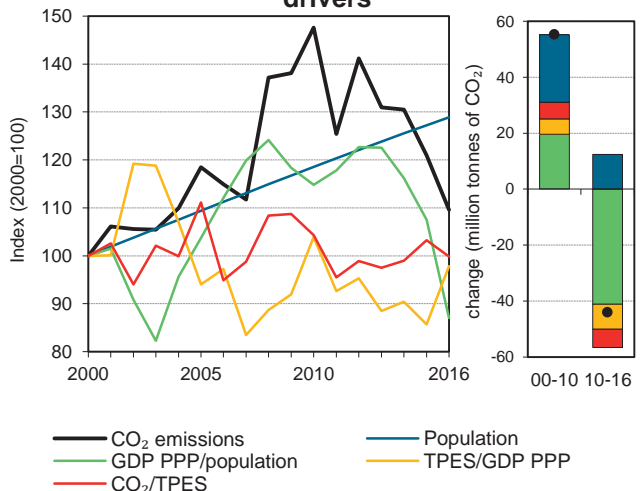


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Bolivarian Republic of Venezuela

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	93.6	106.1	116.2	137.7	171.5	140.5	127.4	36%
Share of World CO ₂ from fuel combustion	0.5%	0.5%	0.5%	0.5%	0.6%	0.4%	0.4%	
TPES (PJ)	1655	1 958	2 143	2 285	3 030	2 511	2 352	42%
GDP (billion 2010 USD)	235	278.4	289.0	327.8	393.2	395.2	324.0	38%
GDP PPP (billion 2010 USD)	281.2	333.1	345.8	392.3	470.6	472.9	387.8	38%
Population (millions)	19.9	22.2	24.5	26.8	29.0	31.2	31.6	59%
CO ₂ / TPES (tCO ₂ per TJ)	56.6	54.2	54.2	60.3	56.6	56.0	54.2	-4%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	-1%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.33	0.3	0.3	0.4	0.4	0.3	0.3	-2%
CO ₂ / population (tCO ₂ per capita)	4.7	4.8	4.7	5.1	5.9	4.5	4.0	-14%
Share of electricity output from fossil fuels	38%	30%	26%	27%	33%	39%	40%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	282	185	190	209	246	296	301	7%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	113	124	147	183	150	136	36%
Population index	100	112	123	135	146	157	159	59%
GDP PPP per population index	100	106	100	103	114	107	87	-13%
Energy intensity index - TPES / GDP PPP	100	100	105	99	109	90	103	3%
Carbon intensity index - CO ₂ / TPES	100	96	96	107	100	99	96	-4%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.5	80.7	46.2	-	127.4	36%
Electricity and heat generation	-	17.4	16.5	-	33.9	102%
Other energy industry own use	-	7.5	15.2	-	22.7	15%
Manufacturing industries and construction	0.5	12.7	12.1	-	25.3	8%
Transport	-	40.0	0.0	-	40.0	40%
<i>of which: road</i>	-	40.0	-	-	40.0	40%
Other	-	3.0	2.4	-	5.5	8%
<i>of which: residential</i>	-	2.2	1.8	-	4.0	-1%
<i>of which: services</i>	-	0.8	0.6	-	1.4	51%
<i>Memo: international marine bunkers</i>	-	2.3	-	-	2.3	-8%
<i>Memo: international aviation bunkers</i>	-	1.5	-	-	1.5	49%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	40.0	28.5	16.3	16.3
Main activity prod. elec. and heat - oil	17.4	5.7	7.1	23.4
Main activity prod. elec. and heat - gas	15.2	7.8	6.2	29.6
Other energy industry own use - gas	15.2	11.2	6.2	35.7
Manufacturing industries - oil	12.7	7.0	5.2	40.9
Manufacturing industries - gas	12.1	14.7	4.9	45.9
Other energy industry own use - oil	7.5	8.5	3.1	48.9
Residential - oil	2.2	3.7	0.9	49.8
Residential - gas	1.8	0.4	0.7	50.6
<i>Memo: total CO₂ from fuel combustion</i>	<i>127.4</i>	<i>93.6</i>	<i>51.9</i>	<i>51.9</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Viet Nam

Figure 1. CO₂ emissions by fuel

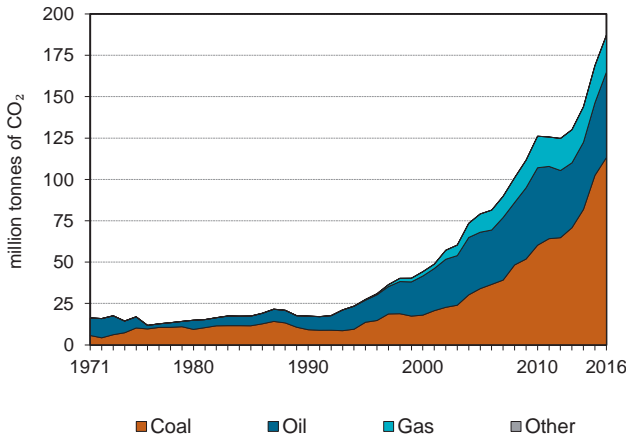


Figure 2. CO₂ emissions by sector

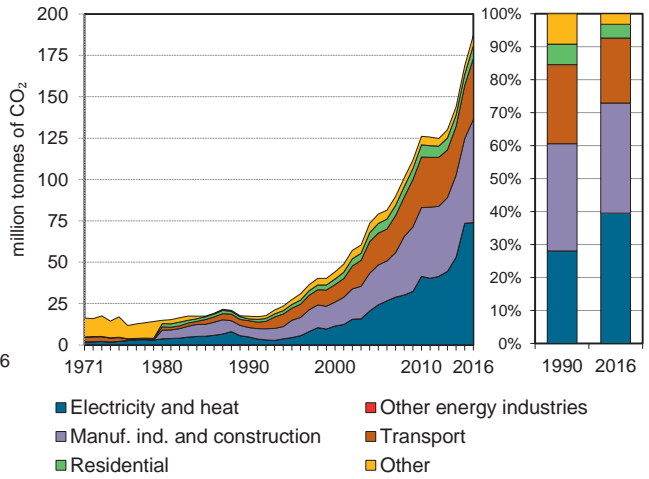


Figure 3. Electricity generation by fuel

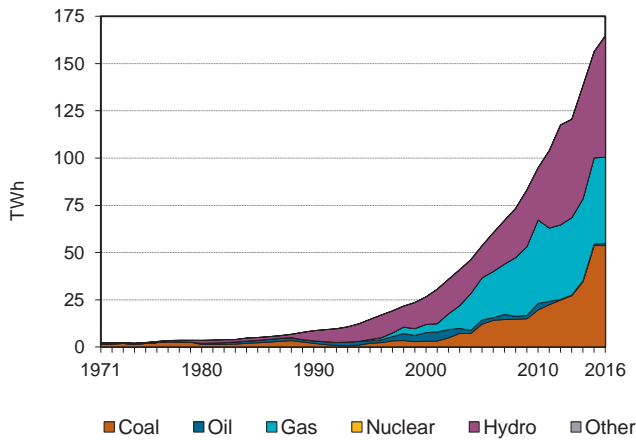


Figure 4. CO₂ from electricity generation: driving factors¹

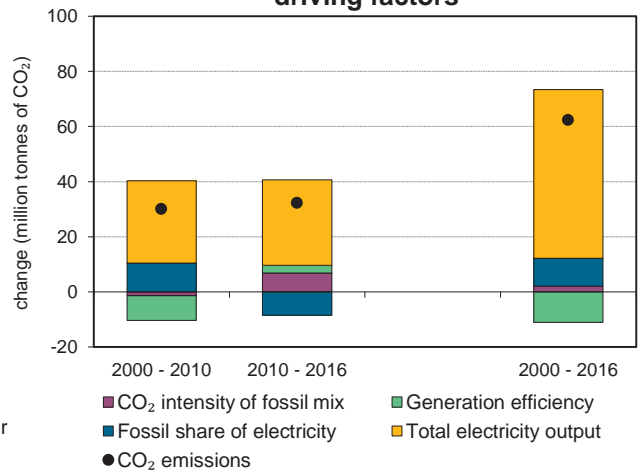


Figure 5. Changes in selected indicators

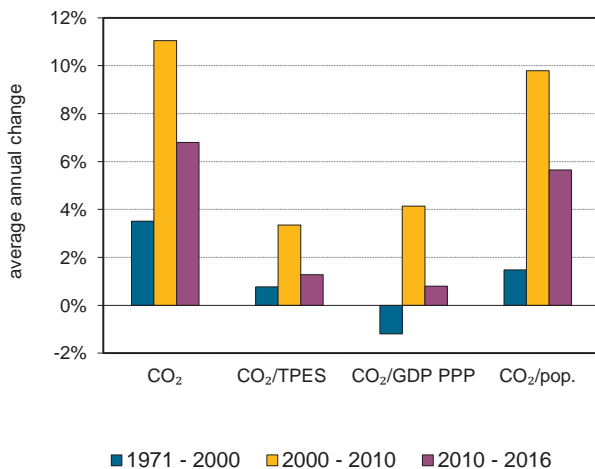
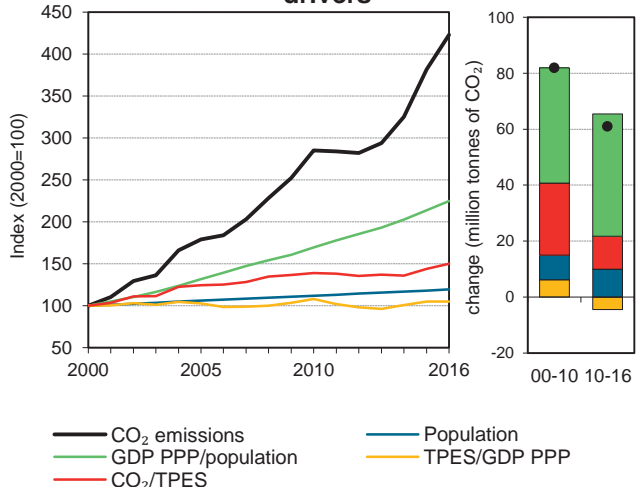


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Viet Nam

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	17.4	27.5	44.2	79.1	126.1	168.7	187.1	976%
Share of World CO ₂ from fuel combustion	0.1%	0.1%	0.2%	0.3%	0.4%	0.5%	0.6%	
TPES (PJ)	748	916	1 203	1 727	2 467	3 189	3 391	353%
GDP (billion 2010 USD)	29.5	43.7	61.1	85.4	115.9	154.5	164.1	457%
GDP PPP (billion 2010 USD)	97.1	144.0	201.5	281.3	382.1	509.3	540.9	457%
Population (millions)	66	72.0	77.6	82.4	86.9	91.7	92.7	40%
CO ₂ / TPES (tCO ₂ per TJ)	23.2	30.0	36.8	45.8	51.1	52.9	55.2	137%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.59	0.6	0.7	0.9	1.1	1.1	1.1	93%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.18	0.2	0.2	0.3	0.3	0.3	0.3	93%
CO ₂ / population (tCO ₂ per capita)	0.3	0.4	0.6	1.0	1.5	1.8	2.0	667%
Share of electricity output from fossil fuels	38%	28%	45%	68%	71%	64%	61%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	562	306	433	453	437	470	449	-20%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	158	254	455	725	970	1076	976%
Population index	100	109	118	125	132	139	140	40%
GDP PPP per population index	100	136	177	232	299	378	397	297%
Energy intensity index - TPES / GDP PPP	100	83	77	80	84	81	81	-19%
Carbon intensity index - CO ₂ / TPES	100	129	158	197	220	228	237	137%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	113.2	51.6	22.3	-	187.1	976%
Electricity and heat generation	54.2	1.2	18.5	-	73.9	+
Other energy industry own use	-	-	-	-	-	-
Manufacturing industries and construction	52.4	6.2	3.8	-	62.4	+
Transport	-	36.9	-	-	36.9	786%
<i>of which: road</i>	-	35.7	-	-	35.7	842%
Other	6.5	7.3	-	-	13.9	417%
<i>of which: residential</i>	4.8	3.0	-	-	7.8	622%
<i>of which: services</i>	1.6	2.9	-	-	4.5	406%
<i>Memo: international marine bunkers</i>	-	0.7	-	-	0.7	667%
<i>Memo: international aviation bunkers</i>	-	4.3	-	-	4.3	x

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Manufacturing industries - coal	52.4	4.2	14.6	14.6
Main activity prod. elec. and heat - coal	52.1	3.7	14.6	29.2
Road - oil	35.7	3.8	10.0	39.2
Main activity prod. elec. and heat - gas	17.9	0.0	5.0	44.2
Manufacturing industries - oil	6.2	1.4	1.7	45.9
Residential - coal	4.8	0.9	1.4	47.2
Non-specified other - oil	4.3	1.3	1.2	48.5
Manufacturing industries - gas	3.8	-	1.0	49.5
Residential - oil	3.0	0.2	0.8	50.3
<i>Memo: total CO₂ from fuel combustion</i>	<i>187.1</i>	<i>17.4</i>	<i>52.2</i>	<i>52.2</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Yemen

Figure 1. CO₂ emissions by fuel

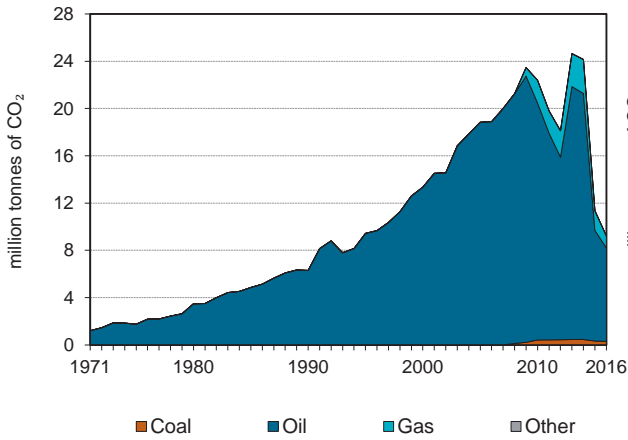


Figure 2. CO₂ emissions by sector

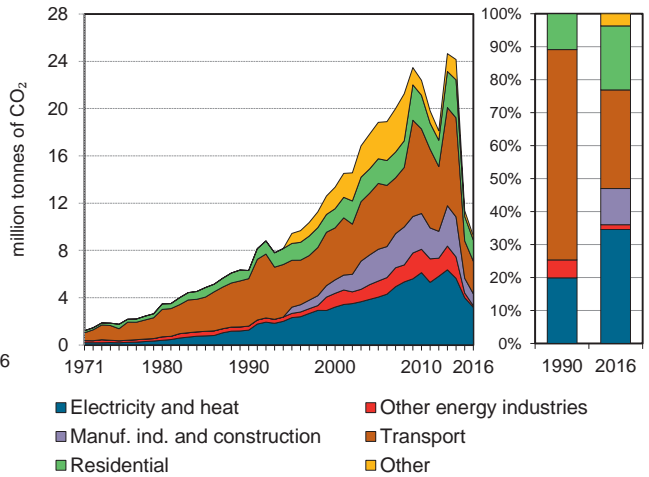


Figure 3. Electricity generation by fuel

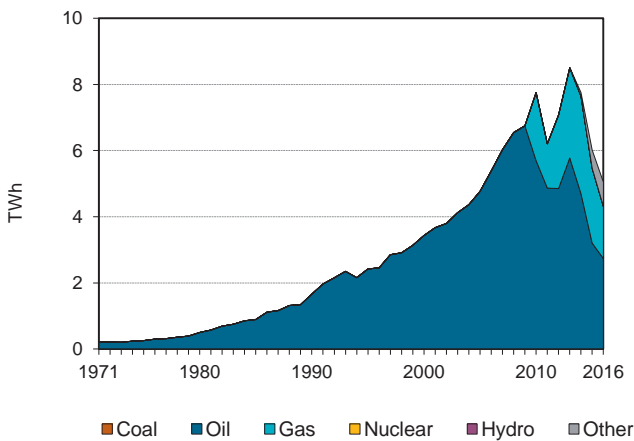


Figure 4. CO₂ from electricity generation: driving factors¹

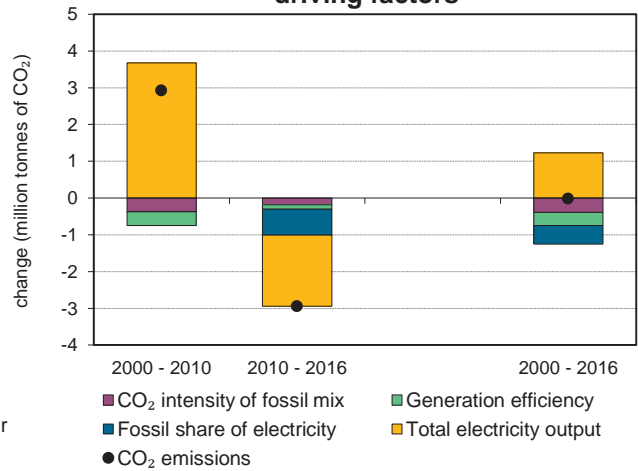


Figure 5. Changes in selected indicators

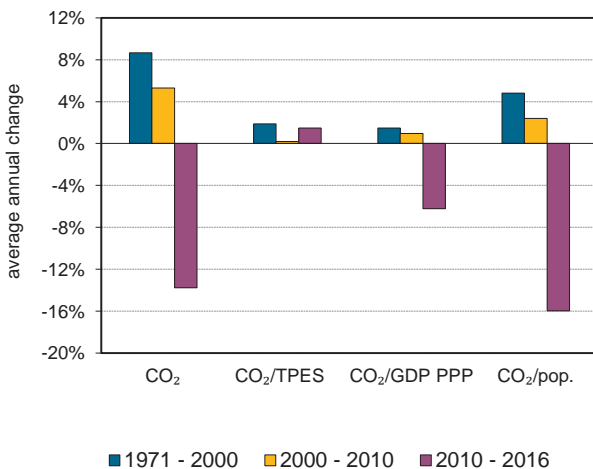
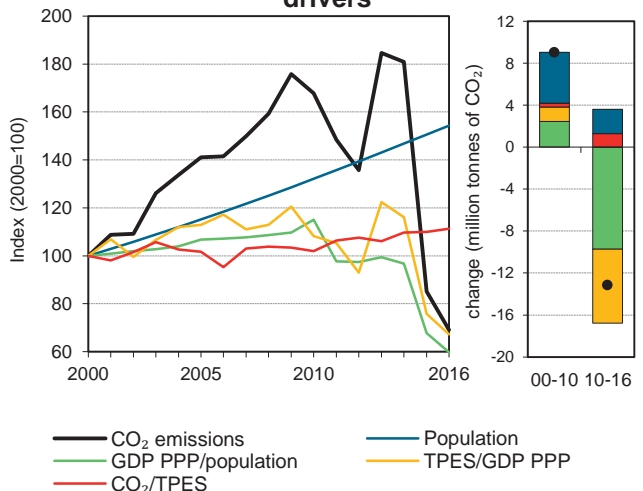


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Yemen

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	6.3	9.4	13.3	18.8	22.4	11.4	9.2	46%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.1%	0.1%	0.1%	0.0%	0.0%	
TPES (PJ)	105	143	199	276	327	154	123	17%
GDP (billion 2010 USD)	11.7	15.8	20.3	25.0	30.9	20.8	18.7	60%
GDP PPP (billion 2010 USD)	39.3	53.0	68.2	83.8	103.6	69.6	62.8	60%
Population (millions)	12.1	15.3	17.9	20.6	23.6	26.9	27.6	129%
CO ₂ / TPES (tCO ₂ per TJ)	59.8	66.0	67.2	68.3	68.5	73.8	74.8	25%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.54	0.6	0.7	0.8	0.7	0.5	0.5	-8%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.16	0.2	0.2	0.2	0.2	0.2	0.1	-8%
CO ₂ / population (tCO ₂ per capita)	0.5	0.6	0.7	0.9	0.9	0.4	0.3	-36%
Share of electricity output from fossil fuels	100%	100%	100%	100%	100%	91%	86%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	754	955	934	849	789	665	632	-16%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	150	212	299	356	180	146	46%
Population index	100	127	148	171	196	223	229	129%
GDP PPP per population index	100	106	117	125	135	79	70	-30%
Energy intensity index - TPES / GDP PPP	100	101	109	123	118	83	73	-27%
Carbon intensity index - CO ₂ / TPES	100	110	112	114	114	123	125	25%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.3	7.9	1.0	-	9.2	46%
Electricity and heat generation	-	2.2	1.0	-	3.2	154%
Other energy industry own use	-	0.1	-	-	0.1	-62%
Manufacturing industries and construction	0.3	0.7	-	-	1.0	x
Transport	-	2.8	-	-	2.8	-31%
<i>of which: road</i>	-	2.8	-	-	2.8	-31%
Other	-	2.1	-	-	2.1	210%
<i>of which: residential</i>	-	1.8	-	-	1.8	160%
<i>of which: services</i>	-	0.2	-	-	0.2	x
<i>Memo: international marine bunkers</i>	-	0.2	-	-	0.2	-87%
<i>Memo: international aviation bunkers</i>	-	0.0	-	-	0.0	-89%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Road - oil	2.8	4.0	7.3	7.3
Main activity prod. elec. and heat - oil	2.1	0.9	5.5	12.8
Residential - oil	1.8	0.7	4.7	17.5
Main activity prod. elec. and heat - gas	1.0	-	2.7	20.1
Manufacturing industries - oil	0.7	-	1.9	22.0
Non-specified other - oil	0.3	-	0.9	22.9
Manufacturing industries - coal	0.3	-	0.8	23.7
Other energy industry own use - oil	0.1	0.3	0.3	24.1
Unallocated autoproducers - oil	0.1	0.3	0.2	24.3
<i>Memo: total CO₂ from fuel combustion</i>	9.2	6.3	24.3	24.3

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Zambia

Figure 1. CO₂ emissions by fuel

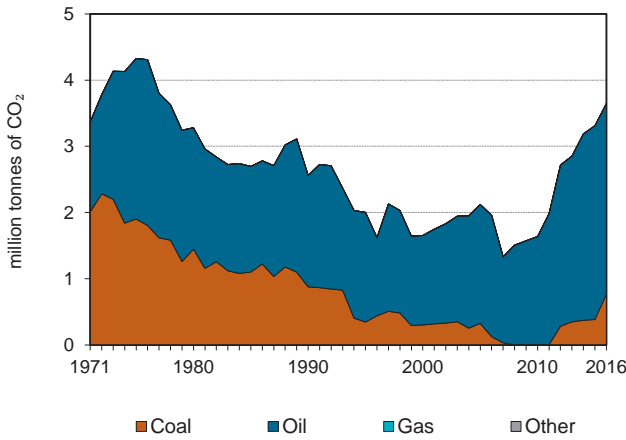


Figure 2. CO₂ emissions by sector

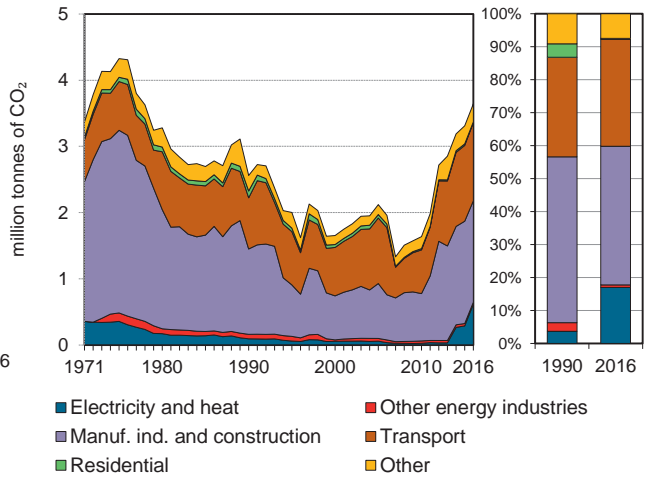


Figure 3. Electricity generation by fuel

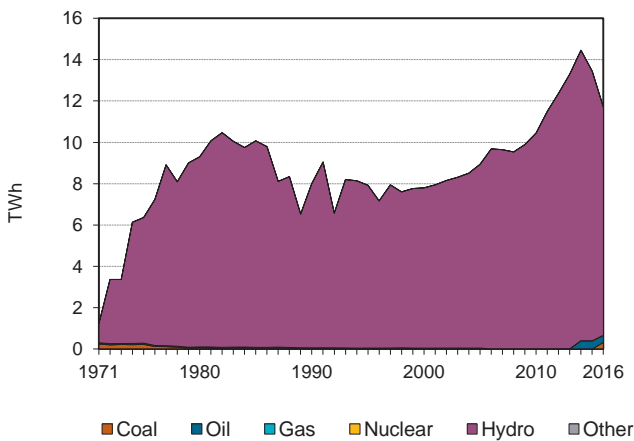


Figure 4. CO₂ from electricity generation: driving factors¹

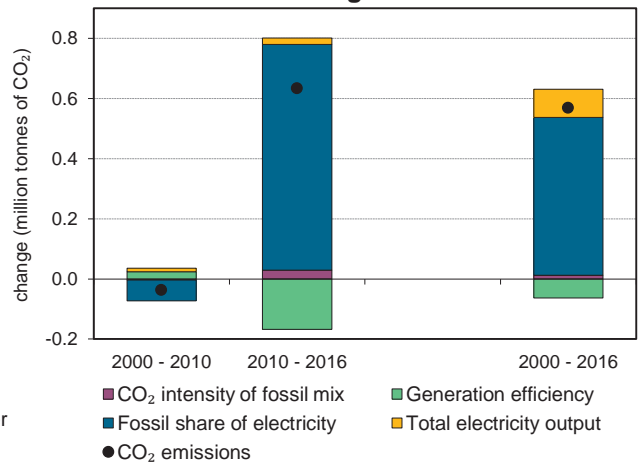


Figure 5. Changes in selected indicators

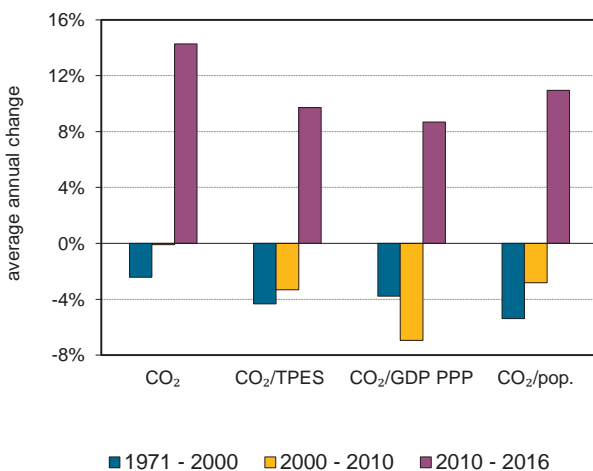
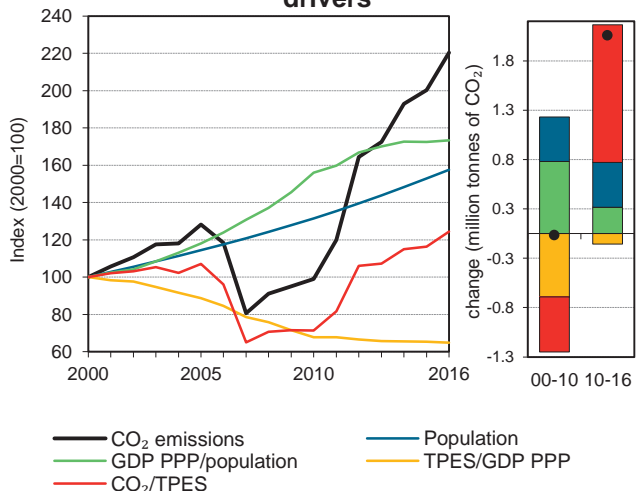


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Zambia

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	2.6	2.0	1.7	2.1	1.6	3.3	3.6	42%
Share of World CO ₂ from fuel combustion	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	227	244	263	315	365	453	466	106%
GDP (billion 2010 USD)	8.4	8.3	9.9	13.4	20.3	26.1	26.9	221%
GDP PPP (billion 2010 USD)	18.4	18.2	21.7	29.3	44.5	57.2	59.3	222%
Population (millions)	8	9.1	10.5	12.1	13.9	16.1	16.6	107%
CO ₂ / TPES (tCO ₂ per TJ)	11.3	8.2	6.3	6.7	4.5	7.3	7.8	-31%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	0.31	0.2	0.2	0.2	0.1	0.1	0.1	-56%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.14	0.1	0.1	0.1	0.0	0.1	0.1	-56%
CO ₂ / population (tCO ₂ per capita)	0.3	0.2	0.2	0.2	0.1	0.2	0.2	-31%
Share of electricity output from fossil fuels	1%	1%	1%	1%	0%	3%	6%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	12	7	7	6	2	21	53	355%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	78	65	83	64	129	142	42%
Population index	100	114	131	150	173	201	207	107%
GDP PPP per population index	100	87	90	106	140	155	156	56%
Energy intensity index - TPES / GDP PPP	100	109	98	87	67	64	64	-36%
Carbon intensity index - CO ₂ / TPES	100	73	56	60	40	65	69	-31%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	0.8	2.9	-	-	3.6	42%
Electricity and heat generation	0.4	0.2	-	-	0.6	564%
Other energy industry own use	-	0.0	-	-	0.0	-59%
Manufacturing industries and construction	0.4	1.1	-	-	1.5	19%
Transport	-	1.2	-	-	1.2	53%
<i>of which: road</i>	-	1.1	-	-	1.1	64%
Other	-	0.3	-	-	0.3	-16%
<i>of which: residential</i>	-	0.0	-	-	0.0	-89%
<i>of which: services</i>	-	0.1	-	-	0.1	-30%
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.1	-	-	0.1	-40%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Manufacturing industries - oil	1.1	0.6	1.7	1.7
Road - oil	1.1	0.7	1.7	3.5
Manufacturing industries - coal	0.4	0.7	0.6	4.1
Main activity prod. elec. and heat - coal	0.4	-	0.6	4.7
Non-specified other - oil	0.3	0.2	0.4	5.1
Main activity prod. elec. and heat - oil	0.2	0.0	0.4	5.5
Other transport - oil	0.0	0.1	0.1	5.5
Other energy industry own use - oil	0.0	0.1	0.0	5.6
Residential - oil	0.0	0.1	0.0	5.6
<i>Memo: total CO₂ from fuel combustion</i>	3.6	2.6	5.6	5.6

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

Zimbabwe

Figure 1. CO₂ emissions by fuel

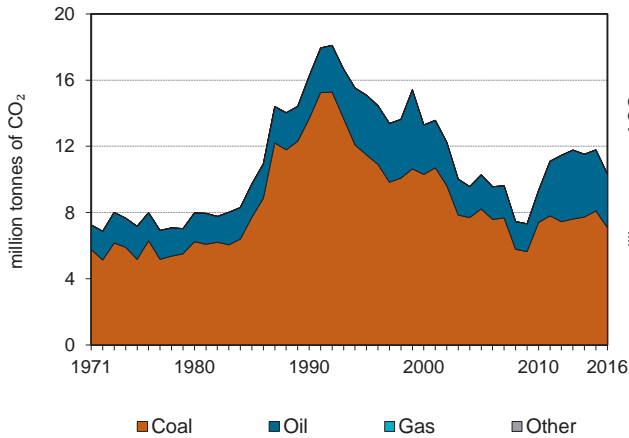


Figure 2. CO₂ emissions by sector

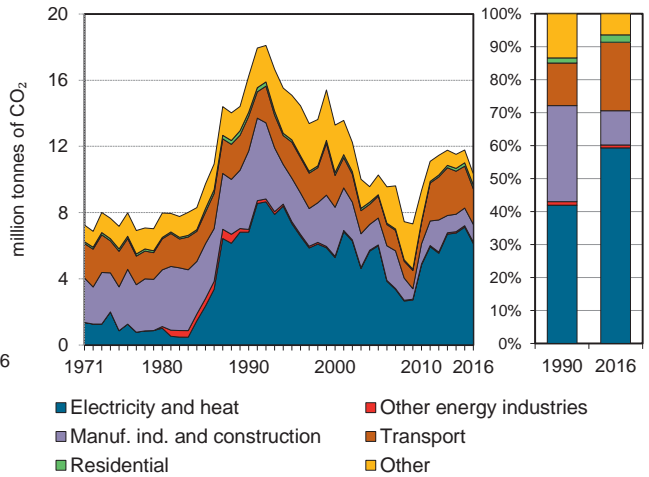


Figure 3. Electricity generation by fuel

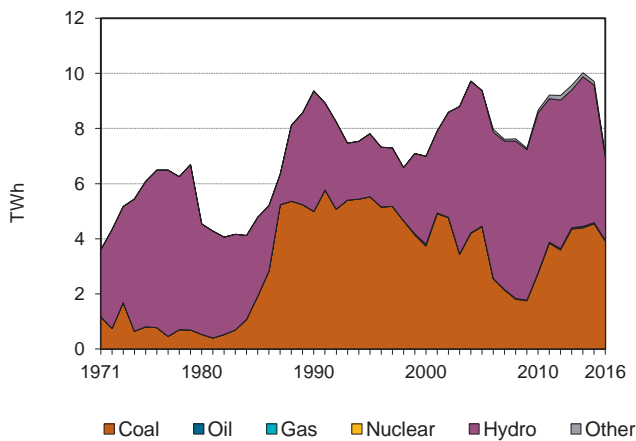


Figure 4. CO₂ from electricity generation: driving factors¹

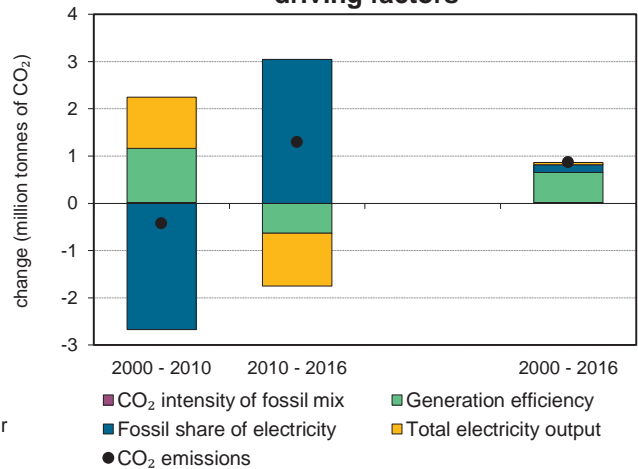


Figure 5. Changes in selected indicators

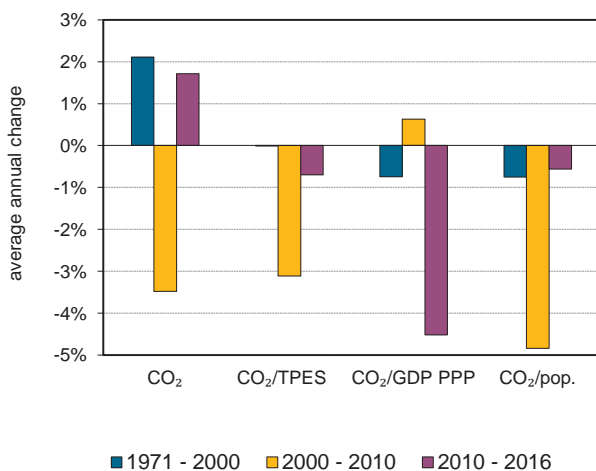
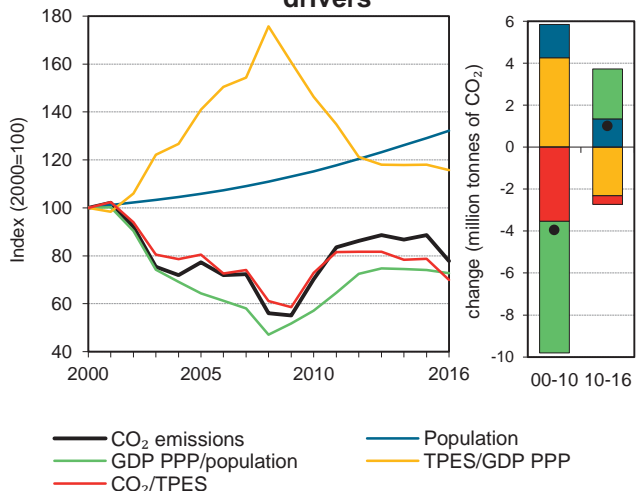


Figure 6. Total CO₂ emissions and drivers²



1. Electricity decomposition: CO₂ emissions = CO₂ intensity of fossil mix x fossil share of elec. x thermal efficiency x elec. output. See Part I, Chapter 2.
 2. Kaya decomposition: CO₂ emissions = CO₂/TPES x TPES/GDP x GDP/population x population. See Part I, Chapter 2.

Zimbabwe

Key indicators

	1990	1995	2000	2005	2010	2015	2016	%change 90-16
CO ₂ fuel combustion (MtCO ₂)	16.3	15.1	13.3	10.3	9.3	11.8	10.3	-36%
Share of World CO ₂ from fuel combustion	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
TPES (PJ)	389	412	419	403	404	472	466	20%
GDP (billion 2010 USD)	12.9	13.7	15.4	10.5	10.1	14.6	14.7	14%
GDP PPP (billion 2010 USD)	26	27.6	30.9	21.1	20.4	29.6	29.7	14%
Population (millions)	10.2	11.3	12.2	12.9	14.1	15.8	16.2	59%
CO ₂ / TPES (tCO ₂ per TJ)	41.7	36.6	31.7	25.5	23.1	25.0	22.2	-47%
CO ₂ / GDP (kgCO ₂ per 2010 USD)	1.26	1.1	0.9	1.0	0.9	0.8	0.7	-44%
CO ₂ / GDP PPP (kgCO ₂ per 2010 USD)	0.63	0.5	0.4	0.5	0.5	0.4	0.3	-44%
CO ₂ / population (tCO ₂ per capita)	1.6	1.3	1.1	0.8	0.7	0.7	0.6	-60%
Share of electricity output from fossil fuels	53%	71%	54%	48%	32%	47%	56%	
CO ₂ / kWh of electricity (gCO ₂ /kWh)	728	929	755	639	558	734	869	19%
CO₂ emissions and drivers - Kaya decomposition (1990=100) ¹								
CO ₂ emissions index	100	93	82	63	57	73	64	-36%
Population index	100	111	120	127	138	155	159	59%
GDP PPP per population index	100	95	99	64	57	73	72	-28%
Energy intensity index - TPES / GDP PPP	100	100	90	128	132	107	105	5%
Carbon intensity index - CO ₂ / TPES	100	88	76	61	55	60	53	-47%

1. Please see the chapter *Indicator sources and methods* in Part I for methodological notes. Based on GDP in 2010 USD, using purchasing power parities.

2016 CO₂ emissions by sector

<i>million tonnes of CO₂</i>	Coal	Oil	Natural gas	Other ²	Total	%change 90-16
CO₂ fuel combustion	7.1	3.2	-	-	10.3	-36%
Electricity and heat generation	6.0	0.1	-	-	6.1	-10%
Other energy industry own use	0.1	-	-	-	0.1	-47%
Manufacturing industries and construction	0.9	0.2	-	-	1.1	-77%
Transport	0.0	2.1	-	-	2.1	3%
<i>of which: road</i>	-	2.0	-	-	2.0	52%
Other	0.0	0.9	-	-	0.9	-63%
<i>of which: residential</i>	-	0.2	-	-	0.2	-4%
<i>of which: services</i>	0.0	-	-	-	0.0	-99%
<i>Memo: international marine bunkers</i>	-	-	-	-	-	-
<i>Memo: international aviation bunkers</i>	-	0.1	-	-	0.1	-46%

2. Other includes industrial waste and non-renewable municipal waste.

Key categories for CO₂ emissions from fuel combustion in 2016

IPCC source category	2016 CO ₂ emissions (MtCO ₂)	1990 CO ₂ emissions (MtCO ₂)	Share in total GHG ³ (%)	Cumulative total (%)
Main activity prod. elec. and heat - coal	6.0	6.8	20.7	20.7
Road - oil	2.0	1.3	7.0	27.6
Manufacturing industries - coal	0.9	4.4	3.1	30.8
Non-specified other - oil	0.6	0.6	2.2	32.9
Residential - oil	0.2	0.1	0.8	33.7
Manufacturing industries - oil	0.2	0.3	0.5	34.3
Other transport - oil	0.1	0.2	0.4	34.6
Other energy industry - coal	0.1	0.2	0.3	34.9
Main activity prod. elec. and heat - oil	0.1	-	0.3	35.2
<i>Memo: total CO₂ from fuel combustion</i>	<i>10.3</i>	<i>16.3</i>	<i>35.4</i>	<i>35.4</i>

3. Percent calculated using the total GHG estimate excluding CO₂ emissions/removals from agriculture, forestry and other land use.

PART III

GREENHOUSE GAS EMISSIONS STATISTICS

1. TRENDS IN GHG EMISSIONS

CO₂ emissions from fuel combustion represent the majority of anthropogenic GHG emissions. However, comprehensive analysis of emission trends considers other sources of CO₂ as well as other gases, knowing that data on gases and sources other than CO₂ from fuel combustion are much more uncertain. Country-specific estimates of CO₂ from biomass burning and F-gas emissions are particularly difficult to ascertain.

To complement work regarding the emissions of CO₂ from fuel combustion, the IEA also included EDGAR data on other CO₂ sources and on five other greenhouse gases; methane (CH₄), nitrous oxide (N₂O) and the fluorinated gases (or “F-gases”) HFCs, PFCs and SF₆, all gases addressed by the Kyoto Protocol.

The information in Part III (with the exception of CO₂ emissions from fuel combustion) has been provided by Monica Crippa and Diego Guizzardi from the Joint Research Centre (JRC) of the European Commission and Jos G.J. Olivier from the PBL Netherlands Environmental Assessment Agency, using the EDGAR database (version 4.3.2_FT2016 for CO₂, version 5.0 for CH₄ and N₂O emissions and 4.2FT2010 for the F-gases) developed jointly by JRC and PBL.

In this edition, the global warming potentials (GWP-100) for the non-CO₂ gases are taken from the IPCC Fourth Assessment Report and no longer from the second. The data in this dataset may differ from previous editions also due to changes in the methodology used for the accounting of large-scale biomass burning (including mainly savannah fires). Therefore, no complete estimates of the land use, land use change and forestry sector emissions are currently provided by the EDGAR database.

Please note that the GHG emissions totals presented here will differ from those shown in countries’ official national inventory submissions to the UNFCCC, primarily due to differences in coverage for the category *Other*. Differences may also occur due to differences in allocation, methodologies and underlying data sources for activities and emission factors, as specified in Part III. Details on possible differences between IEA and UNFCCC CO₂ emissions from fuel combustion estimates can be found in Part I.

Global and regional trends

Dominated by emissions related to fossil fuels, total emissions of all greenhouse gases - weighted by their GWP-100 (from the fourth Assessment Report)¹ - increased by about 92% in 2015 since 1970 (Figure 1). Significant increases were observed for all gases in the 1970-2015 period: CO₂, excluding large-scale biomass burning (124%); CH₄ (34%), N₂O (72%), and the F-gases (579%).

Global total GHG emissions increased during the period 1990-2015 by 45% when including large-scale biomass burning for CH₄ and N₂O (and by 48% when large scale biomass burning is excluded) driven again by a 56% growth in CO₂ emissions from fuel combustion. Increases in CO₂ emissions from industrial processes (mainly cement production) (102%), CH₄ and CO₂ emissions from fossil fuel production (32%) and CH₄ from waste (41%), CH₄ and N₂O emissions from agriculture (9%), and the F-gases (about 176%, mainly from HFC use) also contributed to the total increase. The industrial process emissions increased their share from 4.8% in 1990 to 5.8% in 2015 and the F-gases increased their share of global emissions from 1% in 1990 to 5% in 2015.

1. Global warming potential: see Box 1.

The picture varies significantly across regions and gases, even without the large scale biomass burning, which we leave out in the rest of this section. In 2015, most **methane** (CH₄) emissions originated in non-Annex I regions such as China (19%), India (13%) and Brazil (6%). Emissions from Annex I countries contributed 25% of total emissions, with the largest contribution coming from USA (7%) and Russia (5%). Rest of Asia (excl. China, India, Russia) contributed 20% whereas the rest of Latin America (excl. Brazil) 7%.

CH₄ emissions from animals and their waste are dominant in Latin America and South Asia, while emissions from rice cultivation are common in South, East and Southeast Asia. Fugitive methane emissions are concentrated at coal production sites in East Asia (mainly China), North America, Europe and Eurasia, and at gas production and distribution systems in the Former Soviet Union countries and North America. Methane from waste stems mainly from landfills in Annex I countries and from wastewater disposal predominantly in non-Annex I countries.

Non-Annex I regions produced 68% of global **nitrous oxide** (N₂O) emissions in 2015: China (19%), India (12%), Brazil (6%) and Mexico (4%). N₂O

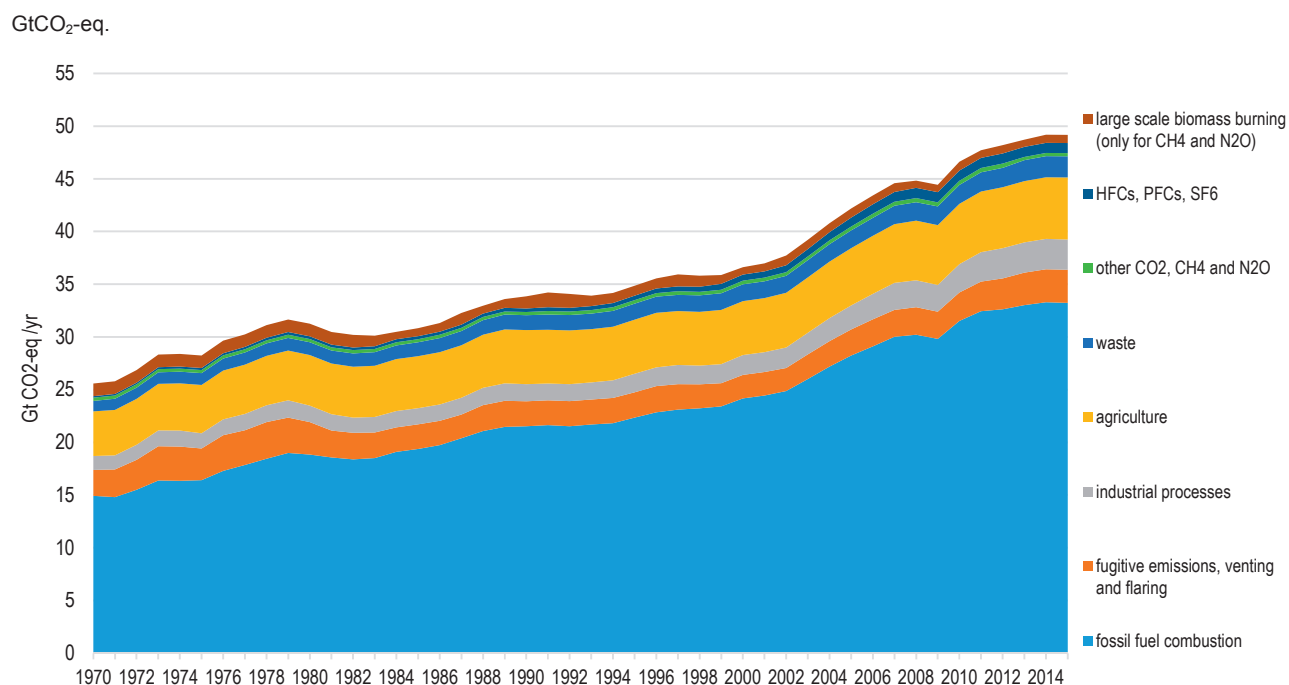
emissions from Annex I countries contributed 31% to the global total, with most emissions originating in North America (10%) and Europe (11%) and less from Russia (3%). Rest of Asia (excl. China, India, Russia) contributed 13%, Africa 13% and rest of Latin America (excl. Brazil and Mexico) 6%.

N₂O emissions from animal waste are dominant in the non-Annex I regions of Latin America, Africa and South Asia; N₂O from fertiliser use is largest in East Asia (mainly China) and Latin America followed by North America, Europe and South Asia (mainly India). N₂O emissions from crop production are largest in North America, Latin America, South Asia and East Asia. Industrial processes also emit significant volumes of N₂O.

The 2015 shares of Annex I countries in total CH₄ and total N₂O emissions (25% and 31% respectively) are lower than their share in global fossil CO₂ emissions (37%).

In 2015, most **fluorinated gas** (F-gas) emissions originated in Annex I countries (61%), with North America contributing 32%, OECD Europe 13%, OECD Asia 15% and Oceania 1%. Non Annex I countries contributed about 39% to global F-gas emissions.

Figure 1. Global GHG emissions 1970-2015

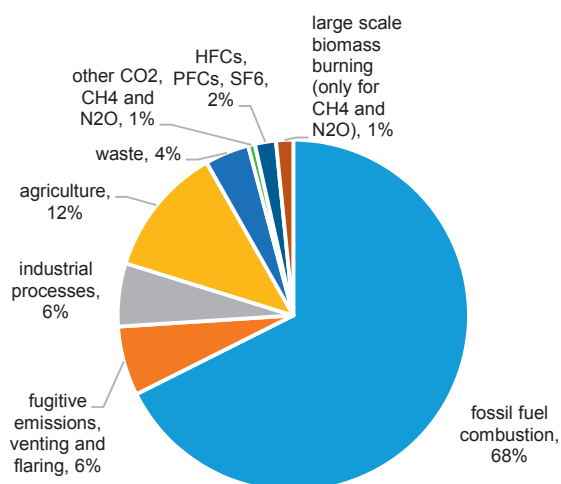


Sources: OECD/IEA *CO₂ Emissions from Fuel Combustion 2018*; JRC/PBL, EDGAR version 4.3.2_FT2016 for CO₂, 5.0 for CH₄ and N₂O and 4.2 FT2010 for the F-gases, 2017

Trends by gas

In 2015, CO₂ contributed 73% of global GHG emissions, CH₄ about 19%, N₂O about 6% and the combined F-gases about 2% (Figure 2). The largest sources of GHG emissions were the fossil fuel combustion (68%, mainly CO₂), and agriculture (12%, mainly CH₄ and N₂O). Other sources of greenhouse gases were CO₂ from industrial processes (6%, of which mostly cement production) and CO₂ and CH₄ emissions from fuel production (6%)

Figure 2. Global GHG emissions by gas/source in 2015



CO₂ emission trends

We discuss long cycle carbon CO₂, excluding CO₂ from biofuels, which is accounted in the land-use sector and neutral under a sustainable biomass growth. Energy (power and manufacturing, but also energy for transport and buildings) increasingly dominates the trend in global CO₂ emissions, accounting for 86% of the global total in 2015, from 84% in 1970. This share varies between 90-99% in most Annex I countries (on average 94% in 2015), whereas it varies more widely in non-Annex I countries (on average 80% in 2015 but lower than 10% in some African, Latin American and Asian countries).

Over the 1990-2015 period, total fossil fuel combustion emissions of CO₂ increased about 57% worldwide (by about 198% in non-Annex I countries while decreasing 9% in Annex I countries). Emissions from electricity and heat production and from road transport dominated global trends. Between 1990 and 2015, CO₂ emissions from electricity and heat production did not significantly change for Annex I countries

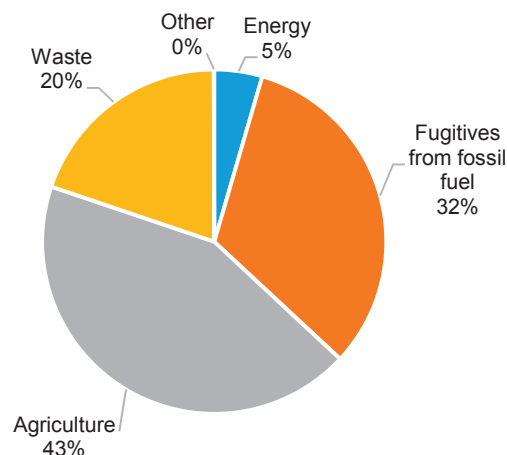
whereas it increased by 331% for the non-Annex I countries. Over the same period, road transport emissions rose 16% in Annex I countries and 211% in non-Annex I countries. By 2015, these two sectors together accounted for 54% of global total CO₂ emissions from fuel combustion. For an analysis and discussion of recent trends in CO₂ emissions, especially those energy related, we refer to the introduction of this publication and for the trend until 2016 we refer to Janssens-Maenhout et al. (2017b).

In 2015, CO₂ emissions from process emissions (in particular cement clinker production – i.e. excluding fossil fuel use) represented almost 6% of total CO₂ emissions worldwide. Between 1990 and 2015, CO₂ from cement production increased by almost 171%.

CH₄ emission trends

As seen in Figure 3, the major global sources of methane (CH₄) emissions in 2015 were (a) agriculture (43%), mainly from enteric fermentation by animals and animal waste, from rice cultivation and from savannah burning; (b) energy production and transmission/distribution fugitives (32%), mainly from coal production, and gas production, transmission and distribution; and (c) waste (20%), from landfills and wastewater.

Figure 3. Global CH₄ emissions in 2015



Between 1970 and 2015, global methane emissions (excluding biomass burning) increased by 34%. In the 1970s emissions increased with an average growth rate of 1.3% per year. In the 1980s, this growth rate slowed down and even decreased to an average of -0.2% per year, determined mainly by the growth rates of emissions in Other Europe and Eurasia (from increased gas production and transmission) and in East Asia (where coal production shifted towards surface mining, which

releases less methane than underground mining). In addition, enteric fermentation by ruminants and waste and wastewater disposal contributed to the increased emissions, particularly in non-Annex I regions. Emissions from rice cultivation are estimated to have decreased due to changes in types of rice grown and to other organic amendment practices.

In the 1990s, an average decrease of 0.3% per year was observed. The economic decline of Former Soviet Union countries in the early 1990s strongly influenced this global methane trend. Their emissions from coal production, from gas transmission and from animals (enteric fermentation) decreased substantially between 1990 and 1995. It should be stressed, however, that detailed statistics for this region are uncertain over this period. Despite the overall decline in the 1990s, increases were observed regionally: for gas production in the Middle East and North America, for landfills in Latin America and wastewater in South Asia, for large-scale biomass burning in developing countries and for coal production in China.

Since 2000, emissions started increasing again, with an average growth rate of 1.7% per year, yielding a faster increase than in the last four decades. This led to a global increase of about 21% over the period 2000-2015, driven by increased coal mining in China and increased cattle numbers in Brazil.

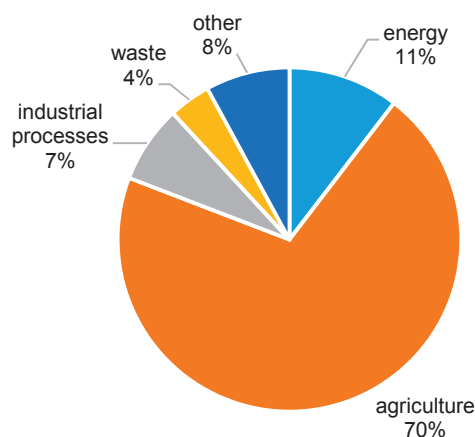
Between 1990 and 2015, country-specific trends of activity data and emission factors lead to an increase of global total methane emissions of about 17%. During this period, emissions in non-Annex I countries increased about 38%, with the largest absolute growth occurring in Asia and Africa. Emissions in Annex I countries decreased by 18%, mainly driven by the countries of the Former Soviet Union. OECD Europe decreased by about 21%, mainly as a result of the policies of the United Kingdom and Germany, with reduced coal production and increased methane recovery from coal mines (up to 50%). In North America and OECD Europe, methane from landfills also decreased by about 50% due to enhanced waste separation and methane recovery.

N₂O emission trends

For **nitrous oxide** (N₂O), agriculture contributed 70% of emissions in 2015, mainly from synthetic fertilisers, animal waste dropped on soils (either as animal manure or on pasture during grazing) and agricultural waste burning (Figure 4). Much smaller sources are energy (11%, mainly from coal and fuelwood combustion and road transport) and industrial

processes (7%), mostly in Annex I countries. Between 1970 and 2015, global emissions of N₂O (excluding large scale biomass burning) increased by about 72%. Increased use of synthetic fertilisers and manure from livestock since the 1970s caused agricultural emissions in South Asia and East Asia to increase on average by 3-4% annually. These regional emission trends continued into the 2000s. Emissions from Latin America and Africa also increased in the 1990s, predominantly from the same sources and from forest fires.

Figure 4. Global N₂O emissions in 2015



In contrast, N₂O emissions from industrial processes decreased by 40% during the 1980s. This decrease resulted from the gradual upgrade of global production facilities for nitric acid. By 1990 about 20% of the facilities were equipped for non-selective catalytic reduction limiting NO_x emissions while simultaneously reducing N₂O emissions. Since 1990 further reductions occurred due to emission abatement in adipic acid production.

During the 1970s, North America and Japan introduced catalytic converters in cars with gasoline engines to reduce emissions of precursors of tropospheric ozone, but with higher N₂O emissions as a side effect. Since the 1990s this technology was also introduced in Europe and Australia. Until about 2000 these catalytic converters contributed to an increase in N₂O emissions in these countries, however, in the late 1990s newer types were introduced with lower specific N₂O emissions.

In the period 1990-2015, global N₂O emissions are estimated to have increased by about 30%. Over this period, emissions in non-Annex I countries increased by over 67%, mainly in the agricultural sectors of South Asia, East Asia and Latin America. The increase

was partially offset by decreasing emissions of the Former Soviet Union countries (-30%). In OECD Europe, N₂O decreased by 27% since 1990, mainly due to emissions abatement in the chemical industry, and to decreased use of nitrogen fertilisers.

Box 1: Global warming potential

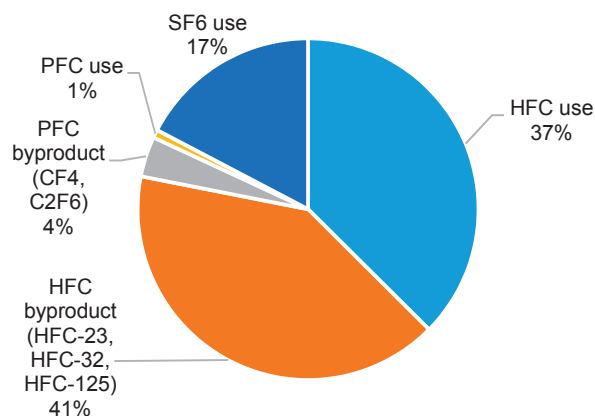
The contribution of non-CO₂ gases to total emissions can be estimated by expressing the emissions of all the gases in CO₂-equivalent units. For a given gas, emissions expressed in mass are multiplied by its specific weighting factor, the Global warming potential (GWP). The GWP-100 is an estimate of the relative contribution of 1 kg of that gas to global radiative forcing, as compared to 1 kg of CO₂, integrated over a fixed period of 100 years.

The data in this chapter use the updated GWP-100 values from IPCC's Fourth Assessment Report (IPCC, 2007), as the Parties to the Climate Convention do for their emissions inventory reporting from 2015 onwards. These GWP-100 values give a higher GWP-100 value for CH₄ (25), and a lower GWP-100 value for N₂O (298). In addition, for the F-gases, the GWP-100 values have been adjusted to a lower value of 22800 for SF₆, but higher values for HFC-134a (1430) and HFC-23 (14800).

HFC, PFC and SF₆ emission trends

For the **fluorinated gases** ("F-gases") (Figure 5), emissions are split between "use" and "by-products" because of the different ways in which they are produced. HFC use represented 37% of the total in 2015, of which HFC 134a alone represented 51%. Total by-product emissions of HFC contributed 41% and of PFCs another 4%. SF₆ use represented 17% and the remaining PFC use contributes only 1% to the total of F-gas emissions. Most F-gas emissions are emitted by Annex I countries.

Figure 5. Global F-gas emissions in 2015



Between 1990 and 2015, the estimated emissions of F-gases increased by about 176%, mainly due to an increase in HFC emissions: emissions of HFC in 2015 were about 677% higher than in 1990. During the same period, PFCs emissions decreased by about 69% while SF₆ emissions increased by about 52%. Annex I regions experienced large growth in F-gas emissions, with regional increases on the order of 142% except for North America which showed an increase of 180%. On a regional basis, total F-gas emission trends varied between 10% and 1900% for the non-Annex I regions, with the largest absolute increases coming from East Asia, driven by an almost twenty-fold increase in China, which is here included in East Asia.

Since 1995, global F-gas emissions have increased more rapidly mainly due to the increase in HFC emissions despite the 66% reduction in PFCs emissions. The small reductions in global SF₆ emissions observed in the period 1996-2004 were mainly due to reductions in emissions from the manufacture and use of switch-gear for the electricity sector. The large reduction in PFC emissions in recent years is due to the phasing-out of old Söderberg technology for aluminium production in China. Global emissions of HFCs other than HFC-134a now exceed emissions of HFC-134a, widely used for refrigeration and air-conditioning.

2. SOURCES AND METHODS

The information in Part III (with the exception of CO₂ emissions from fossil fuel combustion) has been provided by Monica Crippa, Diego Guizzardi and Jos G.J. Olivier based on the EDGAR version 4.3.2_FT2016 for CO₂, version 5.0 for CH₄ and N₂O emissions and 4.2FT2010 for the F-gases. JRC and PBL are responsible for these datasets.

General note on EDGAR

The *Emissions Database for Global Atmospheric Research (EDGAR)* has been developed jointly by the European Commission's Joint Research Centre (JRC) and the PBL Netherlands Environmental Assessment Agency and is hosted at edgar.jrc.ec.europa.eu. EDGAR v4.3.2 is providing global anthropogenic emissions of greenhouse gases CO₂, CH₄, N₂O, HFCs, PFCs and SF₆ and of precursor gases and air pollutants CO, NO_x, NMVOC, SO₂ and the aerosols PM₁₀, PM_{2.5}, BC, OC, per source category, both at country level as well as on a 0.1 x 0.1° grid online to its large community of users. EDGAR data are used for policy applications and scientific studies such as atmospheric modelling and were used for the *Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC, 2014)* (Working Group III).

Activity data were mostly taken from international statistics (checked for completeness and consistency and where required gap filled) and greenhouse gas emission factors were selected mostly from the *2006 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC, 2006)* to ensure a consistent approach across countries and complete and consistent time series. It is stressed that the uncertainty in the resulting dataset at national level may be substantial, especially for methane and nitrous oxide, and even more so for the F-gases (see Box 2 for more details). However, this

dataset provides a sound basis for comparability with national emissions reports and other studies since the methods used are either IPCC methodologies or comparable to them (see below), global totals are obtained in a transparent way and comply with budgets used in atmospheric studies, and the data were based on international information sources. For recent estimates of the GHG emissions, reports of Annex I countries to the *UN Convention on Climate Change (UNFCCC)* and the recent and significant impact of *Clean Development Mechanism* projects in developing countries to reduce CH₄, N₂O and HFC-23 emissions were taken into account. This applies to sources such as coal mines and landfills (CH₄ recovery), nitric acid and adipic acid production (N₂O) and the production of HCFC-22 (HFC-23).

The EDGAR v4.3.2 dataset covers 1970-2012 time-series for all sector-specific and country-specific totals of greenhouse gases. Thereto new activity data statistics (with updated and revised time series) were uploaded for energy-related emissions using IEA (2017), for agriculture related activities till 2015 using the latest FAO statistics (FAOSTAT, 2018) and emission factors revised where appropriate. Although this dataset has been constructed with great care, JRC and PBL do not accept any liability from use of the data provided in this report including any inaccuracies or omissions in the data provided. For details on uncertainty and caveats identified in the dataset, as well as more detailed source category estimates, we refer to Janssens-Maenhout et al. (2017a) and the EDGAR v4.3.2 website at <http://edgar.jrc.ec.europa.eu/overview.php?v=432&SECURE=123>.

Note that estimates for other more recent years than 2012 are also made publicly available through this website. Most recent trends for CO₂ emissions through 2016 are discussed in Olivier et al. (2017) and Janssens-Maenhout et al. (2017b).

Box 2: Uncertainty in greenhouse gas emissions.

When considering comparative shares and trends in greenhouse-gas emissions, data on gases and sources other than CO₂ from fuel combustion are much more uncertain. Country-specific estimates of CO₂ from biomass burning and F-gas emissions are particularly difficult to ascertain. The uncertainty in these emissions is caused by the limited accuracy of international activity data used and in particular of emission factors selected for calculating emissions on a country level (Olivier, 2002; Olivier *et al.*, 2005). For a detailed evaluation of emission uncertainties using international statistics and IPCC and other emission factors we refer to the *2006 IPCC Guidelines* (2006), and for comparisons between countries and datasets to Olivier *et al.* (2005, 2010, 2015).

For global total anthropogenic CO₂ emissions the calculated uncertainty in the total ranges from about -10% to +10%, including large-scale biomass burning. For global emissions of CH₄, N₂O and the F-gases uncertainty estimates of 25%, 30% and 20%, respectively, were assumed based on default uncertainty estimates for the 2006 IPCC methodologies (IPCC, 2006), which correspond with emissions estimates inferred from atmospheric concentration measurements (UNEP, 2012).

When considering emission shares and trends of countries one should note that:

CO₂: Fossil fuel combustion, which is often the largest source of CO₂ in a country, is estimated to have an uncertainty of about 5% (95% confidence interval) for OECD countries. However, for many non-OECD countries the uncertainty is estimated at about 10%. This is often regarded as the most accurate source of GHG emissions.

CH₄: Uncertainties are particularly large for methane emissions from fugitive sources (coal mining and from oil and gas production and transmission) and from landfills and wastewater.

N₂O: Uncertainties of most N₂O sources are very large, e.g. the uncertainty for agricultural sources may sometimes exceed 100%.

F-gases: Uncertainties in annual emissions of most sources of F-gases are very large, e.g. at a country level they may well exceed 100%. Therefore, the figures provided for individual countries should be considered solely as order-of-magnitude estimates.

Source definitions

The source definitions for *Fuel combustion* refer to the categories and codes used in the 2006 IPCC guidelines, Chapter 8 of Vol. 1: *General guidance and reporting* (IPCC, 2006). For other categories and codes the definitions refer to the Revised 1996 IPCC guidelines, Chapter 1 of Vol. 1: *Reporting instructions* (IPCC, 1996).

Note that the IPCC guidelines are sometimes ambiguous in where to report emissions from particular sources e.g. when reporting to the UNFCCC, countries may opt to report CO₂ emissions from integrated steel plants (including coke ovens and blast furnaces), wholly under IPCC Source/Sink Category 1A, or also under 1B1 and 2C.

For carbon dioxide:

Fuel combustion refers to fossil fuel combustion only. Emissions have been estimated by the IEA using the methodology as described in the chapter *IEA estimates: Changes under the 2006 IPCC Guidelines* in Part I. (2006 IPCC Source/Sink Category 1A)

Fugitive refers mainly to flaring of associated gas in oil and gas production (in some cases including indirect CO₂ from methane venting) (IPCC Source/Sink Category 1B).

Industrial Processes refer to production of cement, lime, soda ash, carbides, ammonia, methanol, ethylene and other chemicals, metals and to the use of soda ash, limestone and dolomite, and non-energy use of lubricants and waxes. Emissions exclude *Fuel combustion* emissions. (IPCC Source/Sink Category 2).

Other CO₂ emissions refer to direct emissions from solvent use (IPCC Source/Sink Category 3), from application of urea and agricultural lime (IPCC Source/Sink Category 4) and from fossil fuel fires (coal fires & the Kuwait oil fires) (IPCC Source/Sink Category 7). It does not include the significant amount of large scale biomass burning emissions, as these are part of the land use, land-use change and forestry sector, for which a different methodology and use of satellite is required.

For methane:

Energy comprises production, handling, transmission and combustion of fossil fuels and biofuels (IPCC Source/Sink Categories 1A and 1B).

Agriculture comprises enteric fermentation, rice production, manure management, agricultural waste burning (non-energy, on-site) and savannah burning (IPCC Source/Sink Category 4).

Waste comprises landfills, wastewater treatment, wastewater disposal and waste incineration (non-energy) (IPCC Source/Sink Category 6).

Other includes industrial process emissions e.g. methanol production, and forest and peat fires and other vegetation fires (IPCC Source/Sink Categories 2 and 5).

For nitrous oxide:

Energy comprises combustion of fossil fuels and bio-fuels (IPCC Source/Sink Categories 1A and 1B).

Agriculture comprises fertiliser use (synthetic and manure), animal waste (manure) management, agricultural waste burning (non-energy, on-site) and savannah burning (IPCC Source/Sink Category 4).

Industrial Processes comprise non-combustion emissions from manufacturing of adipic acid, nitric acid, caprolactam and glyoxal (IPCC Source/Sink Category 2).

Other includes N₂O usage, forest and peat fires (including post-burn decay emissions from remaining biomass) and other vegetation fires, human sewage discharge and waste incineration (non-energy) and indirect N₂O from atmospheric deposition of NO_x and NH₃ from non-agricultural sources (IPCC Source/Sink Categories 3, 5, 6 and 7).

For fluorinated gases:

HFC emissions comprise by-product emissions of HFC-23 from HCFC-22 manufacture and the use of HFCs (IPCC Source/Sink Categories 2E and 2F).

PFC emissions comprise by-product emissions of CF₄ and C₂F₆ from primary aluminium production and the use of PFCs, in particular for the manufacture of semiconductors, flat panel displays and photovoltaic cells) (IPCC Source/Sink Categories 2C, 2E and 2F). *SF₆ emissions* stem from various sources of SF₆ use (mainly manufacturing of Gas Insulated Switchgear (GIS) used in the electricity distribution networks) (IPCC Source/Sink Categories 2C and 2F) and from SF₆ production (Category 2E).

Data sources and methodology for EDGAR v4.3.2FT2016 and EDGAR v4.2FT2010

The **EDGAR v4.2FT2010** has been available online since October 2013² and **EDGAR v4.3.2_FT2016** since July 2017³. For greenhouse gases, the default emission factors from the *2006 IPCC Guidelines* (IPCC, 2006) were used, except for CH₄ and N₂O from road transport where technology-specific factors were used from the EMEP-EEA emission inventory guidebook (EEA, 2009).

The **EDGAR v4.3.2_FT2016** dataset covers the entire period 1970-2016 and is largely based on IEA(2014) energy statistics and FAOSTAT (2018) agriculture statistics. The EDGAR v4.3.2_FT2016 dataset was used in this publication as data input for the CO₂ emissions for *Fugitives* and *Industrial Processes*, the CH₄ emissions and the N₂O emissions. Updated activity data using the latest FAO statistics for agriculture (FAOSTAT, 2018) were included to estimate CH₄ and N₂O emissions from agriculture. The emissions of the F-gases are taken from the EDGAR v4.2FT2010 dataset. The methods, data sources and emission factors used for this new dataset are documented in Janssens-Maenhout et al. (2017a,b). For the documentation of the EDGAR v4.2FT2010 dataset we refer to a previous publication of this report (part III) in 2015.

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2. See <http://edgar.jrc.ec.europa.eu/overview.php?v=42FT2010>.

3. See <http://edgar.jrc.ec.europa.eu/overview.php?v=432&SECURE=123>

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GHG EMISSIONS STATISTICS

SUMMARY TABLES

1990 Greenhouse-gas emissions

 million tonnes of CO₂ equivalent using GWP-100

	CO ₂						CH ₄					
	Fuel comb.	Fugitive	Industrial processes	Other	Total	Share of energy	Energy	Agricult.	Waste	Other	Total	Share of energy
World ¹	20 518.2	424.2	1 317.2	340.6	22 601.9	92.7%	2 647.1	4 076.3	1 332.4	168.9	8 224.6	32.2%
<i>Annex I Parties</i>	13 719.3	163.2	757.8	227.7	14 868.0	93.4%	914.2	1 020.7	633.2	33.4	2 601.5	35.1%
<i>Annex II Parties</i>	9 654.2	84.9	473.4	179.6	10 392.2	93.7%	484.5	671.1	497.1	15.3	1 668.0	29.0%
<i>North America</i>	5 222.7	33.0	168.1	117.6	5 541.4	94.8%	314.3	231.7	229.8	10.0	785.8	40.0%
<i>Europe</i>	3 113.0	42.0	201.3	54.6	3 410.8	92.5%	133.8	250.8	224.2	0.8	609.6	21.9%
<i>Asia Oceania</i>	1 318.6	9.9	104.0	7.4	1 439.9	92.3%	36.4	188.5	43.0	4.6	272.6	13.4%
<i>Annex I EIT</i>	3 930.1	74.0	267.1	46.0	4 317.2	92.7%	421.8	320.1	120.1	18.0	880.0	47.9%
<i>Non-Annex I Parties</i>	6 168.3	261.0	559.4	112.8	7 103.1	90.5%	1 724.5	3 055.5	699.2	135.5	5 614.7	30.7%
<i>Annex B Kyoto Parties</i>	5 382.7	99.4	346.4	82.3	5 910.9	92.7%	348.4	561.0	300.4	7.9	1 217.6	28.6%
Intl. aviation bunkers	258.9	-	-	-	258.9	100.0%	0.0	-	-	-	0.0	100.0%
Intl. marine bunkers	371.7	-	-	-	371.8	100.0%	8.4	-	-	-	8.4	100.0%
Non-OECD Total	8 870.8	306.0	738.4	143.2	10 060.0	91.2%	2 023.0	3 227.5	756.6	148.1	6 155.2	32.9%
OECD Total	11 016.7	118.1	578.9	197.4	11 911.1	93.5%	615.6	848.7	575.8	20.8	2 061.0	29.9%
Canada	419.6	6.0	24.9	3.7	454.2	93.7%	58.4	22.6	25.8	4.4	111.2	52.5%
Chile	29.4	0.8	2.4	0.2	32.9	92.0%	5.6	6.8	4.7	0.0	17.1	32.7%
Mexico	257.0	2.6	25.8	4.2	289.6	89.6%	32.8	68.6	19.3	5.1	125.9	26.1%
United States	4 803.1	27.0	143.2	113.9	5 087.2	94.9%	255.9	209.1	204.0	5.6	674.6	37.9%
OECD Americas	5 509.1	36.5	196.3	122.1	5 863.9	94.6%	352.7	307.2	253.9	15.1	928.8	38.0%
Australia	259.7	5.9	10.5	2.0	278.1	95.5%	27.5	112.1	17.6	4.5	161.7	17.0%
Israel ²	32.8	-	2.3	0.2	35.3	93.0%	0.1	1.0	2.7	0.0	3.8	3.6%
Japan	1 037.1	4.1	92.1	4.6	1 137.9	91.5%	7.9	48.3	21.6	0.1	77.9	10.1%
Korea	231.8	13.8	22.1	1.8	269.5	91.1%	9.9	18.4	10.3	0.0	38.6	25.7%
New Zealand	21.8	0.0	1.4	0.7	23.9	91.1%	1.0	28.1	3.8	0.0	33.0	3.1%
OECD Asia Oceania	1 583.2	23.8	128.4	9.4	1 744.8	92.1%	46.5	208.0	55.9	4.6	315.1	14.8%
Austria	56.2	0.5	4.9	1.2	62.8	90.3%	2.0	5.9	5.1	0.0	13.0	15.3%
Belgium	106.3	1.3	7.5	0.8	115.9	92.8%	4.4	7.5	5.5	0.0	17.3	25.5%
Czech Republic	150.2	3.3	7.3	2.1	162.8	94.3%	7.3	9.0	3.4	0.0	19.7	37.2%
Denmark	51.0	0.2	1.0	1.3	53.6	95.6%	0.7	6.5	2.0	-	9.2	7.3%
Estonia	35.0	0.7	1.0	0.2	37.0	96.8%	0.6	1.9	1.4	0.0	3.9	14.9%
Finland	53.8	0.1	2.2	1.1	57.2	94.2%	1.1	3.1	8.9	0.0	13.1	8.1%
France	345.6	3.0	29.3	7.1	384.9	90.6%	11.6	48.6	16.4	0.2	76.8	15.1%
Germany	940.0	20.8	44.4	14.3	1 019.4	94.2%	40.4	49.9	52.8	0.1	143.2	28.2%
Greece	69.9	0.1	7.7	1.4	79.2	88.4%	12.3	4.5	3.2	0.0	20.1	61.5%
Hungary	65.7	0.5	4.7	1.2	71.9	91.9%	2.8	6.4	3.5	0.0	12.6	21.9%
Iceland	1.9	-	0.4	0.0	2.3	80.9%	0.0	0.3	0.2	0.0	0.5	1.7%
Ireland	30.1	0.1	1.9	0.7	32.8	92.1%	1.5	12.9	1.7	-	16.1	9.5%
Italy	389.4	3.8	29.8	7.2	430.2	91.4%	6.7	25.3	22.7	0.1	54.8	12.2%
Latvia	18.8	0.0	1.0	0.3	20.1	93.4%	0.7	3.8	0.6	0.1	5.2	13.4%
Luxembourg	10.7	-	1.0	0.0	11.8	91.4%	0.1	0.4	0.1	-	0.6	11.6%
Netherlands	147.8	0.7	11.9	1.3	161.6	91.8%	6.8	13.8	15.9	0.1	36.6	18.7%
Norway	27.5	2.3	6.5	1.0	37.3	79.9%	7.2	2.6	3.3	0.0	13.1	54.8%
Poland	344.8	6.8	15.9	3.5	370.9	94.8%	60.6	27.2	14.8	0.0	102.6	59.0%
Portugal	37.9	0.2	4.9	0.7	43.7	87.2%	0.6	5.0	5.1	0.0	10.7	5.8%
Slovak Republic	54.8	0.4	5.1	0.2	60.5	91.2%	1.5	3.9	1.9	0.0	7.4	20.8%
Slovenia	13.5	0.0	1.4	1.7	16.6	81.4%	1.3	1.4	1.0	0.0	3.7	34.7%
Spain	202.6	2.3	20.5	4.6	229.9	89.1%	4.8	21.4	10.2	0.1	36.6	13.0%
Sweden	52.1	0.9	3.5	1.7	58.1	91.1%	0.9	4.1	8.7	0.0	13.6	6.3%
Switzerland	40.7	0.0	3.5	0.7	44.9	90.7%	0.6	4.4	1.5	0.0	6.4	9.0%
Turkey	128.8	4.2	16.7	2.1	151.7	87.6%	7.9	29.2	15.2	0.0	52.3	15.1%
United Kingdom	549.4	5.7	20.6	9.4	585.1	94.9%	32.2	34.7	60.9	0.1	127.9	25.2%
OECD Europe	3 924.5	57.9	254.2	65.9	4 302.5	92.6%	216.5	333.5	266.0	1.0	817.0	26.5%
<i>IEA/Accession/Association</i>	14 274.1	173.7	931.4	279.8	15 659.0	92.3%	1 234.0	2 426.9	972.9	99.6	4 733.4	26.1%
<i>European Union - 28</i>	4 027.2	52.9	257.2	65.2	4 402.4	92.7%	216.8	329.8	259.3	1.2	807.1	26.9%
<i>G20</i>	16 791.9	227.4	1 077.8	300.8	18 399.4	92.5%	1 591.5	2 559.9	1 034.7	116.5	5 302.6	30.0%
<i>Africa</i>	529.1	98.2	40.5	5.1	672.9	93.2%	481.9	638.4	101.7	17.9	1 239.9	38.9%
<i>Americas</i>	6 062.5	60.5	247.7	138.5	6 509.2	94.1%	495.5	903.0	353.9	85.0	1 837.4	27.0%
<i>Asia</i>	5 829.6	142.5	540.4	92.6	6 605.0	90.4%	1 069.0	1 792.2	501.5	36.2	3 398.8	31.5%
<i>Europe</i>	7 176.2	117.1	476.4	101.5	7 871.2	92.7%	562.6	584.9	350.7	18.9	1 517.0	37.1%
<i>Oceania</i>	281.4	5.9	11.9	2.8	302.0	95.1%	28.5	140.3	21.4	4.5	194.7	14.7%

1. Total World includes Non-OECD total, OECD total as well as international bunkers. 2. Please refer to the chapter Geographical coverage.

 Sources: IEA, CO₂ emissions from fuel combustion, EDGAR 4.3.2 FT2016, EDGAR 5.0 and 4.2 FT2010 databases for other emissions.

1990 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

Energy	N ₂ O					Share of energy	HFCs	PFCs	SF ₆	Total			
	Industrial processes	Agriculture	Other	Total	Industrial processes		Total	Share of energy	GHG / GDP PPP ³				
204.7	206.0	1 855.4	338.0	2 604.0	7.9%	95.9	140.1	108.9	33 775.5	70.5%	0.73	World ¹	
126.8	176.5	609.2	128.6	1 041.1	12.2%	77.8	106.5	80.0	18 775.0	79.5%	0.62	Annex I Parties	
102.3	137.6	407.2	87.4	734.5	13.9%	71.4	81.2	73.3	13 020.6	79.3%	0.52	Annex II Parties	
71.9	34.9	166.5	44.8	318.1	22.6%	37.4	36.1	44.0	6 762.8	83.4%	0.68	North America	
23.1	92.5	162.8	29.6	308.1	7.5%	21.6	31.6	15.1	4 396.8	75.3%	0.41	Europe	
7.3	10.2	77.9	13.0	108.3	6.7%	12.4	13.5	14.2	1 860.9	73.7%	0.44	Asia Oceania	
22.9	38.7	180.1	36.7	278.4	8.2%	6.4	24.7	4.8	5 511.6	80.7%	1.17	Annex I EIT	
72.9	29.5	1 246.2	195.2	1 543.9	4.7%	18.1	33.6	28.9	14 342.2	57.4%	0.91	Non-Annex I Parties	
36.8	116.9	341.5	50.1	545.3	6.8%	22.4	42.2	15.6	7 754.0	75.7%	0.57	Annex B Kyoto Parties	
2.2	-	-	1.7	3.9	55.7%	-	-	-	262.9	99.3%	..	Intl. aviation bunkers	
2.9	-	-	12.4	15.2	18.7%	-	-	-	395.5	96.9%	..	Intl. marine bunkers	
87.3	57.0	1 346.6	216.9	1 707.9	5.1%	20.0	54.3	28.4	18 025.9	62.6%	1.01	Non-OECD Total	
112.3	149.0	508.7	107.0	877.0	12.8%	75.9	85.8	80.5	15 091.2	78.6%	0.53	OECD Total	
6.0	11.3	16.5	6.1	40.0	15.1%	0.5	10.0	3.8	619.7	79.1%	0.72	Canada	
0.3	0.0	4.0	0.5	4.8	5.6%	-	-	0.0	54.9	65.9%	0.51	Chile	
2.1	1.0	34.7	6.9	44.7	4.6%	2.0	0.6	0.8	463.7	63.5%	0.44	Mexico	
65.9	23.6	150.0	38.7	278.1	23.7%	36.9	26.0	40.2	6 143.1	83.9%	0.68	United States	
74.3	35.9	205.3	52.1	367.6	20.2%	39.5	36.7	44.9	7 281.4	82.0%	0.66	OECD Americas	
2.1	0.8	59.0	5.2	67.0	3.1%	0.8	4.5	0.4	512.5	57.6%	1.05	Australia	
0.1	0.2	0.8	0.7	1.8	7.1%	0.0	0.1	1.0	42.0	78.8%	0.47	Israel ²	
5.0	9.4	9.4	7.5	31.3	16.0%	11.6	7.9	13.8	1 280.4	82.3%	0.35	Japan	
1.4	1.1	4.9	2.1	9.4	14.4%	2.4	1.0	3.3	324.2	79.2%	0.65	Korea	
0.2	-	9.5	0.3	10.0	2.0%	-	1.0	0.0	68.0	33.8%	0.89	New Zealand	
8.7	11.5	83.5	15.8	119.5	7.3%	14.8	14.6	18.4	2 227.1	74.6%	0.46	OECD Asia Oceania	
0.5	0.8	2.8	0.7	4.8	10.4%	0.0	1.2	0.4	82.3	72.0%	0.35	Austria	
0.6	3.7	3.0	0.9	8.2	6.8%	0.0	0.0	0.1	141.5	79.5%	0.47	Belgium	
1.2	1.2	4.7	1.1	8.1	14.9%	-	0.0	0.0	190.6	85.0%	0.94	Czech Republic	
0.4	1.0	5.6	0.5	7.6	5.6%	-	0.0	0.1	70.5	74.2%	0.41	Denmark	
0.2	-	1.1	0.2	1.5	13.6%	-	0.0	0.0	42.3	86.3%	1.92	Estonia	
1.3	1.5	3.7	0.6	7.1	18.8%	-	0.0	0.1	77.5	72.7%	0.55	Finland	
3.2	20.4	34.3	3.8	61.7	5.1%	5.9	2.0	3.1	534.4	68.0%	0.32	France	
6.5	21.9	32.5	6.7	67.7	9.7%	3.3	5.2	5.3	1 244.1	81.0%	0.52	Germany	
0.7	1.1	4.4	0.8	6.9	9.9%	0.6	2.0	0.1	108.9	76.2%	0.53	Greece	
0.5	3.1	5.3	0.5	9.4	5.5%	-	0.8	0.0	94.7	73.3%	0.55	Hungary	
0.0	0.0	0.3	0.0	0.4	3.5%	-	1.2	0.0	4.4	43.4%	0.62	Iceland	
0.2	0.9	6.4	0.3	7.8	2.9%	0.0	0.0	0.0	56.7	56.4%	0.77	Ireland	
2.2	6.9	15.4	4.1	28.5	7.6%	2.5	1.2	1.2	518.3	77.6%	0.30	Italy	
0.2	-	2.4	0.3	2.9	6.7%	-	0.0	-	28.3	69.7%	0.81	Latvia	
0.0	-	0.1	0.1	0.2	17.1%	-	-	-	12.6	86.2%	0.64	Luxembourg	
0.6	4.7	6.9	1.2	13.4	4.4%	3.5	3.8	0.3	219.2	71.1%	0.47	Netherlands	
0.4	2.1	1.8	0.4	4.6	8.1%	-	7.3	2.2	64.5	57.9%	0.38	Norway	
2.0	3.6	18.6	2.4	26.7	7.5%	-	0.5	0.1	500.7	82.7%	1.32	Poland	
0.5	0.4	2.8	0.6	4.3	10.6%	-	0.0	0.1	58.8	66.6%	0.29	Portugal	
0.5	1.0	2.5	0.3	4.3	10.8%	-	0.1	-	72.3	79.1%	0.94	Slovak Republic	
0.1	-	0.9	0.2	1.2	6.7%	-	0.9	0.0	22.5	66.4%	0.61	Slovenia	
1.8	2.9	15.3	2.7	22.6	7.8%	2.5	4.5	0.4	296.4	71.3%	0.33	Spain	
1.0	0.8	3.9	0.8	6.4	15.2%	-	0.8	0.2	79.2	69.2%	0.31	Sweden	
0.4	0.1	1.6	0.5	2.5	16.8%	-	0.4	0.6	54.8	76.2%	0.18	Switzerland	
1.5	0.1	21.7	4.4	27.8	5.6%	-	0.6	1.9	234.4	60.8%	0.39	Turkey	
2.9	23.6	22.0	4.9	53.5	5.5%	3.3	1.9	1.0	772.7	76.4%	0.51	United Kingdom	
29.4	101.6	220.0	39.1	389.9	7.5%	21.6	34.5	17.2	5 582.8	75.7%	0.45	OECD Europe	
156.0	168.9	1 092.9	214.9	1 632.7	9.6%	90.0	98.8	91.6	22 305.6	71.0%	0.63	IEA/Accession/Association	
28.7	106.1	219.2	36.2	390.3	7.4%	21.6	28.4	12.5	5 662.4	76.4%	0.48	European Union - 28	
169.2	188.8	1 184.7	240.3	1 783.0	9.5%	94.6	115.0	94.8	25 789.4	72.8%	0.68	G20	
11.8	3.6	372.3	26.9	414.6	2.8%	-	3.8	2.6	2 333.7	48.0%	1.11	Africa	
82.1	38.3	455.0	107.8	683.2	12.0%	43.4	47.1	46.8	9 167.0	73.1%	0.65	Americas	
56.7	31.4	603.5	111.7	803.3	7.1%	23.7	25.8	39.2	10 895.9	65.1%	0.80	Asia	
46.6	131.9	349.5	67.3	595.3	7.8%	28.0	57.9	19.9	10 089.4	78.3%	0.65	Europe	
2.3	0.8	68.5	5.5	77.0	2.9%	0.8	5.6	0.4	580.5	54.8%	0.98	Oceania	

1. Total World includes Non-OECD total, OECD total as well as international bunkers. 2. Please refer to the chapter Geographical coverage.

3. GHG / GDP PPP ratio is expressed in kg of CO₂-equivalent per 2010 USD.

1990 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

	CO ₂						CH ₄					
	Fuel comb.	Fugitive	Industrial processes	Other	Total	Share of energy	Energy	Agricult.	Waste	Other	Total	Share of energy
Non-OECD Total	8 870.8	306.0	738.4	143.2	10 060.0	91.2%	2 023.0	3 227.5	756.6	148.1	6 155.2	32.9%
Albania	5.7	0.2	0.6	0.2	6.6	88.8%	0.6	1.8	0.9	0.0	3.3	16.6%
Armenia	19.8	-	0.7	0.2	20.7	95.9%	0.6	1.4	0.3	-	2.3	25.1%
Azerbaijan	53.5	3.5	0.8	0.3	58.1	98.1%	18.6	4.8	1.4	0.0	24.8	74.9%
Belarus	99.9	0.3	4.9	4.0	109.1	91.8%	1.2	17.5	3.5	1.4	23.6	5.1%
Bosnia and Herzegovina	24.0	-	0.5	0.1	24.6	97.6%	3.0	1.5	0.3	0.0	4.8	62.2%
Bulgaria	74.5	0.2	7.1	0.5	82.3	90.8%	2.0	6.6	7.1	0.0	15.6	12.6%
Croatia	20.3	0.2	4.2	0.5	25.2	81.5%	1.3	1.9	0.9	0.0	4.1	32.6%
Cyprus ¹	3.9	-	0.6	0.0	4.5	85.7%	0.0	0.3	0.8	-	1.1	1.5%
FYR of Macedonia	8.6	0.0	2.6	0.0	11.2	76.8%	0.3	1.1	0.4	0.0	1.9	16.3%
Georgia	33.5	-	1.0	0.3	34.7	96.4%	0.7	3.0	0.6	0.0	4.2	17.1%
Gibraltar	0.1	-	0.0	-	0.1	99.3%	0.0	-	0.0	-	0.0	6.7%
Kazakhstan	237.3	3.6	11.6	1.0	253.5	95.0%	47.9	29.8	3.7	0.0	81.5	58.7%
Kosovo	..	-	-	-	..	..	-	-	-	-	-	0.0%
Kyrgyzstan	22.8	-	0.7	0.3	23.7	96.1%	0.7	5.0	1.2	-	6.8	9.7%
Lithuania	32.2	0.0	2.6	0.5	35.3	91.3%	0.8	5.8	1.4	0.1	8.0	9.6%
Malta	2.3	-	0.0	0.0	2.4	98.5%	0.0	0.1	0.0	-	0.1	4.1%
Republic of Moldova	30.5	-	1.2	0.2	32.0	95.5%	0.6	3.2	0.4	-	4.2	13.7%
Montenegro	..	-	-	-	..	..	-	-	-	-	-	0.0%
Romania	168.3	1.1	15.6	1.6	186.7	90.8%	12.0	18.3	3.2	0.1	33.5	35.7%
Russian Federation	2 163.5	26.0	144.7	21.4	2 355.6	92.9%	282.6	152.3	66.1	15.5	516.4	54.7%
Serbia	61.9	0.9	3.2	0.3	66.4	94.6%	2.6	6.2	4.2	0.0	13.0	20.0%
Tajikistan	11.0	-	1.1	0.1	12.3	89.8%	0.5	3.3	0.6	-	4.4	12.2%
Turkmenistan	44.6	0.0	0.6	0.4	45.6	97.9%	26.7	3.3	0.6	-	30.5	87.4%
Ukraine	688.6	34.5	51.8	8.3	783.3	92.3%	47.2	64.4	11.3	0.8	123.7	38.1%
Uzbekistan	114.9	0.3	7.1	1.1	123.4	93.3%	15.6	15.1	2.5	-	33.2	46.8%
Non-OECD Europe and Eurasia	3 921.8	70.7	263.1	41.4	4 297.0	92.9%	465.3	346.5	111.5	17.9	941.2	49.4%
Algeria	51.2	12.7	3.8	0.3	68.0	94.0%	70.1	4.4	4.9	0.0	79.4	88.3%
Angola	3.9	7.2	0.1	0.0	11.3	98.5%	33.4	73.0	1.7	1.5	109.6	30.5%
Benin	0.3	0.0	0.1	0.0	0.4	62.1%	0.8	2.2	0.8	-	3.7	20.8%
Botswana	2.8	-	0.0	0.0	2.8	99.5%	0.4	7.3	0.3	0.1	8.0	5.1%
Cameroon	2.6	1.7	0.4	0.1	4.8	89.4%	8.4	24.4	1.9	2.8	37.6	22.5%
Congo	0.6	1.7	0.0	0.0	2.4	97.9%	7.7	1.9	0.4	0.1	10.2	76.0%
Côte d'Ivoire	2.7	-	0.2	0.1	3.0	89.6%	1.9	5.1	1.9	0.2	9.1	20.8%
Dem. Rep. of the Congo	3.0	0.0	0.3	0.1	3.4	87.0%	3.0	102.8	5.6	6.3	117.7	2.6%
Egypt	77.9	3.0	9.4	1.4	91.7	88.2%	16.7	12.5	9.3	-	38.5	43.4%
Eritrea	..	-	0.0	0.0	0.0	..	0.1	1.7	0.4	-	2.3	5.6%
Ethiopia	2.2	-	0.2	0.1	2.4	90.9%	7.3	47.8	6.3	1.7	63.0	11.6%
Gabon	0.9	5.2	0.1	0.0	6.2	99.0%	22.3	0.7	0.2	0.0	23.2	96.1%
Ghana	2.5	-	0.6	0.1	3.2	79.5%	1.8	4.5	2.3	0.1	8.6	20.8%
Kenya	5.5	-	0.8	0.1	6.5	85.3%	5.9	17.2	3.3	0.2	26.6	22.2%
Libya	25.8	8.4	2.7	0.2	37.1	92.1%	39.8	1.3	1.3	0.0	42.4	93.9%
Mauritius	1.2	-	0.0	0.0	1.2	97.8%	0.1	0.1	0.2	-	0.3	20.4%
Morocco	19.7	-	4.7	0.3	24.7	79.6%	0.4	6.4	4.6	-	11.3	3.4%
Mozambique	1.1	-	0.0	0.1	1.2	91.7%	2.0	8.4	2.1	0.0	12.5	15.7%
Namibia	..	-	0.0	0.0	0.0	..	0.0	4.0	0.2	-	4.3	0.8%
Niger	..	-	0.0	0.0	0.0	..	0.7	6.3	1.1	-	8.1	8.8%
Nigeria	28.1	43.8	2.2	0.6	74.7	96.2%	202.6	26.9	13.6	0.2	243.4	83.3%
Senegal	2.1	-	0.2	0.1	2.4	89.0%	0.9	3.8	1.2	-	5.9	15.6%
South Africa	243.8	14.4	9.9	0.5	268.6	96.1%	28.6	27.9	10.3	0.3	67.2	42.6%
South Sudan	..	-	-	-	..	..	-	-	-	-	-	0.0%
Sudan	5.3	-	0.1	0.2	5.5	95.7%	5.7	63.1	3.9	0.5	73.2	7.8%
United Rep. of Tanzania	1.7	-	0.3	0.1	2.1	79.7%	3.4	19.7	3.8	0.1	27.0	12.6%
Togo	0.6	-	0.2	0.0	0.8	75.2%	0.7	1.7	0.6	0.0	3.0	23.0%
Tunisia	12.2	0.1	2.4	0.1	14.8	83.1%	1.3	2.1	1.7	-	5.0	24.9%
Zambia	2.6	-	0.4	0.0	3.0	86.7%	2.3	19.5	1.4	0.2	23.4	9.9%
Zimbabwe	16.2	-	0.9	0.0	17.2	94.6%	2.3	9.3	1.6	0.0	13.2	17.2%
Other Africa	12.6	-	0.4	0.4	13.5	93.9%	11.2	132.5	15.0	3.7	162.3	6.9%
Africa	529.1	98.2	40.5	5.1	672.9	93.2%	481.9	638.4	101.7	17.9	1 239.9	38.9%

1. Please refer to the chapter Geographical coverage.

1990 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

Energy	N ₂ O					Share of energy	HFCs	PFCs	SF ₆	Total			
	Industrial processes	Agriculture	Other	Total	Industrial processes		Total	Share of energy	GHG / GDP PPP ²				
87.3	57.0	1 346.6	216.9	1 707.9	5.1%	20.0	54.3	28.4	18 025.9	62.6%	1.01	Non-OECD Total	
0.0	-	1.0	0.1	1.2	3.1%	-	-	-	11.1	57.9%	0.74	Albania	
0.1	-	0.5	0.1	0.8	12.5%	-	-	-	23.7	86.4%	1.83	Armenia	
0.3	-	2.0	0.3	2.6	11.6%	-	0.2	-	85.7	88.5%	1.43	Azerbaijan	
0.7	0.3	12.5	1.6	15.2	4.8%	-	0.0	-	147.9	69.1%	1.77	Belarus	
0.1	-	0.8	0.2	1.1	10.1%	-	0.7	-	31.2	86.8%	4.55	Bosnia and Herzegovina	
0.5	1.3	5.5	0.6	7.9	5.9%	-	0.0	-	105.8	72.9%	1.33	Bulgaria	
0.2	0.9	2.0	0.2	3.3	6.3%	-	1.1	-	33.6	65.6%	0.49	Croatia	
0.0	-	0.2	0.1	0.3	5.6%	-	-	-	5.9	66.4%	0.45	Cyprus ¹	
0.1	-	0.5	0.1	0.7	8.5%	-	-	-	13.7	65.2%	0.72	FYR of Macedonia	
0.1	0.7	1.5	0.3	2.6	4.0%	-	-	-	41.6	82.5%	1.10	Georgia	
0.0	-	-	0.0	0.0	25.0%	-	-	-	0.2	89.0%	0.28	Gibraltar	
1.4	-	16.3	1.8	19.5	7.3%	-	-	-	354.5	81.8%	1.70	Kazakhstan	
-	-	-	-	-	0.0%	-	-	-	..	..	..	Kosovo
0.1	-	2.0	0.2	2.3	3.9%	-	-	-	32.8	71.7%	2.19	Kyrgyzstan	
0.3	0.7	3.7	0.4	5.1	5.1%	-	0.0	-	48.4	68.7%	1.07	Lithuania	
0.0	-	0.0	0.0	0.1	11.8%	-	-	-	2.5	92.5%	0.45	Malta	
0.1	-	1.5	0.2	1.8	4.7%	-	-	-	37.9	82.3%	1.62	Republic of Moldova	
-	-	-	-	-	0.0%	-	-	-	..	..	..	Montenegro
0.8	3.9	13.2	1.2	19.1	4.2%	-	2.4	0.0	241.6	75.4%	0.94	Romania	
12.7	15.2	76.8	23.3	128.1	9.9%	6.4	18.7	4.7	3 029.8	82.0%	1.12	Russian Federation	
0.3	0.6	2.7	0.4	4.1	7.2%	0.0	0.9	-	84.4	77.9%	1.54	Serbia	
0.0	-	1.1	0.1	1.2	2.3%	-	3.3	-	21.2	54.6%	1.13	Tajikistan	
0.1	0.1	1.7	0.2	2.0	3.2%	-	-	-	78.2	91.4%	2.60	Turkmenistan	
3.0	7.5	30.9	4.4	45.8	6.7%	-	0.3	-	953.0	81.1%	1.79	Ukraine	
0.2	0.2	7.3	0.6	8.3	2.1%	-	-	-	164.9	79.4%	2.67	Uzbekistan	
21.1	31.5	183.7	36.4	272.7	7.7%	6.4	27.6	4.7	5 549.5	80.7%	1.27	Non-OECD Europe and Eurasia	
0.2	0.4	2.4	0.7	3.6	4.7%	-	-	0.3	151.3	88.7%	0.58	Algeria	
0.2	-	46.7	1.2	48.1	0.4%	-	-	-	169.0	26.5%	3.23	Angola	
0.1	-	1.4	0.1	1.5	4.6%	-	-	-	5.6	19.5%	0.79	Benin	
0.0	-	4.1	0.1	4.2	1.0%	-	-	-	15.0	21.7%	1.37	Botswana	
0.2	-	15.2	2.0	17.4	1.1%	-	1.1	-	60.9	21.3%	1.76	Cameroon	
0.0	-	1.4	0.1	1.6	1.8%	-	-	-	14.1	71.5%	1.15	Congo	
0.1	-	3.0	0.3	3.5	3.9%	-	-	-	15.7	30.2%	0.41	Côte d'Ivoire	
0.5	-	65.3	4.5	70.3	0.7%	-	-	-	191.5	3.4%	4.41	Dem. Rep. of the Congo	
0.3	1.3	8.3	1.5	11.3	2.2%	-	1.5	0.7	143.8	68.1%	0.43	Egypt	
0.0	-	0.7	0.0	0.8	2.5%	-	-	-	3.1	4.7%	..	Eritrea	
0.9	-	26.6	1.9	29.5	3.1%	-	-	-	94.9	10.9%	3.09	Ethiopia	
0.1	-	0.5	0.0	0.6	10.8%	-	-	-	29.9	95.1%	1.64	Gabon	
0.2	-	2.7	0.3	3.2	5.9%	-	0.7	-	15.7	28.9%	0.57	Ghana	
0.3	-	9.0	0.6	9.9	3.5%	-	-	-	42.9	27.4%	0.79	Kenya	
0.1	-	0.8	0.2	1.1	9.0%	-	-	0.3	81.0	91.6%	0.72	Libya	
0.0	-	0.1	0.0	0.2	16.2%	-	-	-	1.7	74.6%	0.22	Mauritius	
0.2	-	4.3	0.6	5.0	3.2%	-	-	-	41.0	49.3%	0.43	Morocco	
0.2	-	5.5	0.3	6.1	3.9%	-	-	-	19.7	16.6%	4.01	Mozambique	
0.0	-	2.0	0.0	2.1	0.5%	-	-	-	6.3	0.7%	..	Namibia	
0.1	-	2.5	0.1	2.7	3.7%	-	-	-	10.8	7.5%	..	Niger	
3.1	-	14.0	2.6	19.7	15.6%	-	-	0.2	338.0	82.1%	1.19	Nigeria	
0.0	-	1.8	0.1	2.0	2.5%	-	-	-	10.3	30.2%	0.75	Senegal	
1.9	0.9	15.9	2.6	21.3	8.8%	-	0.5	1.0	358.6	80.5%	1.00	South Africa	
-	-	-	-	-	0.0%	-	-	-	..	..	..	South Sudan
0.3	-	35.5	0.8	36.6	0.7%	-	-	-	115.3	9.7%	2.60	Sudan	
0.4	-	10.6	0.7	11.7	3.6%	-	-	-	40.8	13.5%	1.14	United Rep. of Tanzania	
0.0	-	1.1	0.1	1.2	3.2%	-	-	-	4.9	26.4%	0.98	Togo	
0.1	0.4	1.1	0.2	1.9	6.7%	-	-	-	21.7	62.9%	0.48	Tunisia	
0.2	0.5	15.6	0.3	16.6	1.1%	-	-	-	43.0	11.8%	2.33	Zambia	
0.4	-	4.8	0.4	5.6	6.5%	-	-	-	36.0	52.5%	1.38	Zimbabwe	
1.7	-	69.3	4.4	75.4	2.2%	-	-	-	251.2	10.2%	1.83	Other Africa	
11.8	3.6	372.3	26.9	414.6	2.8%	-	3.8	2.6	2 333.7	48.0%	1.11	Africa	

1. Please refer to the chapter Geographical coverage.

2. GHG / GDP PPP ratio is expressed in kg of CO₂-equivalent per 2010 USD.

1990 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

	CO ₂						CH ₄					
	Fuel comb.	Fugitive	Industrial processes	Other	Total	Share of energy	Energy	Agricult.	Waste	Other	Total	Share of energy
Bangladesh	11.4	-	1.7	0.8	13.9	82.4%	3.7	82.9	13.1	0.1	99.8	3.7%
Brunei Darussalam	3.3	0.1	0.0	0.0	3.4	98.6%	3.7	0.0	0.1	0.0	3.8	96.9%
Cambodia	..	-	-	0.0	0.0	..	0.4	14.9	1.2	0.3	16.7	2.2%
DPR of Korea	116.8	2.9	10.4	1.0	131.1	91.3%	14.4	6.6	5.2	0.0	26.1	55.0%
India	529.1	7.0	42.6	22.3	602.3	89.0%	68.4	438.3	111.2	5.2	623.1	11.0%
Indonesia	134.2	11.2	14.3	2.9	162.8	89.4%	81.7	98.4	30.2	19.7	230.0	35.5%
Malaysia	49.6	2.2	3.9	2.1	57.7	89.7%	17.0	7.6	3.4	1.2	29.2	58.2%
Mongolia	12.8	-	0.3	0.0	13.2	97.3%	0.6	7.7	0.4	0.3	9.0	7.1%
Myanmar	3.9	0.4	-0.1	0.2	4.4	99.2%	5.8	47.0	6.4	1.7	60.9	9.5%
Nepal	0.9	-	0.1	0.1	1.1	84.0%	1.7	20.4	2.1	0.1	24.4	7.0%
Pakistan	56.0	0.6	6.4	1.2	64.2	88.0%	12.4	77.2	14.2	-	103.8	11.9%
Philippines	38.1	0.0	3.4	1.2	42.7	89.1%	6.3	34.4	11.7	0.0	52.4	12.1%
Singapore	29.0	-	2.4	0.2	31.5	91.9%	0.4	0.0	1.0	0.0	1.4	25.4%
Sri Lanka	3.7	-	0.3	0.2	4.2	88.0%	1.1	10.4	2.2	0.0	13.8	8.1%
Chinese Taipei	111.1	0.8	12.5	1.3	125.8	89.0%	1.1	4.8	5.1	0.0	11.1	10.0%
Thailand	80.9	0.0	10.9	0.9	92.7	87.3%	15.7	73.5	9.4	0.3	99.0	15.9%
Viet Nam	17.4	0.0	2.1	0.7	20.1	86.4%	5.7	55.9	9.7	0.2	71.5	8.0%
Other non-OECD Asia	10.3	0.0	0.3	0.2	10.8	95.0%	1.2	17.5	3.2	6.4	28.4	4.2%
Asia (excl. China)	1 208.4	25.3	111.4	35.3	1 381.9	89.3%	241.2	997.5	230.0	35.8	1 504.4	16.0%
People's Rep. of China	2 088.9	28.9	230.7	42.4	2 390.9	88.6%	383.8	615.0	174.4	6.5	1 179.8	32.5%
Hong Kong, China	33.3	1.0	0.9	0.1	35.4	97.0%	0.1	0.0	1.6	-	1.7	5.3%
China	2 122.2	29.9	231.6	42.5	2 426.2	88.7%	383.9	615.0	176.1	6.5	1 181.5	32.5%
Argentina	99.4	8.5	3.0	1.5	112.4	96.0%	34.6	103.2	9.9	6.2	153.8	22.5%
Bolivia	5.2	1.1	0.2	0.0	6.5	96.2%	6.2	34.1	1.3	12.8	54.4	11.4%
Brazil	184.3	5.9	26.2	11.4	227.8	83.5%	37.3	284.4	51.3	42.1	415.2	9.0%
Colombia	45.8	1.9	4.0	0.6	52.3	91.2%	11.3	42.9	7.2	0.1	61.6	18.4%
Costa Rica	2.6	-	0.2	0.1	2.9	89.4%	0.1	4.0	0.6	0.0	4.7	1.7%
Cuba	34.1	0.0	2.2	0.7	37.0	92.2%	0.6	9.5	4.8	-	14.9	4.3%
Curaçao ¹	2.7	-	-	0.0	2.7	99.8%	0.1	0.0	0.0	-	0.1	87.4%
Dominican Republic	7.4	-	0.5	0.1	8.0	92.3%	0.5	5.0	2.1	-	7.6	6.1%
Ecuador	13.3	3.4	0.7	0.1	17.6	95.1%	14.8	8.6	1.9	-	25.3	58.4%
El Salvador	2.1	-	0.3	0.2	2.6	80.0%	0.3	1.9	0.9	0.0	3.1	10.7%
Guatemala	3.2	0.0	0.5	0.2	3.9	82.8%	0.9	3.5	1.4	0.1	6.0	15.3%
Haiti	0.9	-	0.2	0.0	1.1	81.5%	0.9	2.0	1.4	-	4.3	20.9%
Honduras	2.2	-	0.1	0.0	2.4	92.6%	0.4	3.3	0.8	-	4.5	9.3%
Jamaica	7.2	-	0.3	0.0	7.5	96.3%	0.3	0.7	0.6	-	1.6	16.0%
Nicaragua	1.8	-	0.1	0.0	1.9	94.6%	0.3	4.3	0.7	-	5.3	6.3%
Panama	2.6	-	0.1	0.0	2.7	93.7%	0.1	2.7	0.4	-	3.2	4.0%
Paraguay	1.9	-	0.2	0.1	2.3	85.3%	0.9	29.9	0.8	7.5	39.1	2.3%
Peru	19.2	0.5	1.2	0.2	21.0	93.3%	3.4	10.6	4.6	0.3	18.9	18.0%
Suriname	..	-	0.1	0.0	0.1	..	0.0	0.7	0.1	0.0	0.8	3.5%
Trinidad and Tobago	7.9	0.6	4.1	0.0	12.7	67.3%	4.7	0.1	0.5	0.0	5.3	87.9%
Uruguay	3.6	0.0	0.2	0.1	3.9	93.3%	0.1	17.8	0.9	-	18.8	0.7%
Venezuela	93.6	2.1	6.0	0.7	102.4	93.4%	24.7	24.0	5.1	0.6	54.4	45.5%
Other non-OECD Americas	12.4	0.0	0.9	0.1	13.5	92.1%	0.1	2.7	2.7	0.1	5.6	2.7%
Non-OECD Americas	553.5	24.1	51.4	16.5	645.3	89.5%	142.8	595.8	100.1	69.9	908.5	15.7%
Bahrain	10.7	0.0	1.3	0.0	12.0	89.3%	1.9	0.0	0.3	0.0	2.3	83.0%
Islamic Republic of Iran	171.2	23.4	8.9	1.0	204.5	95.2%	111.3	21.0	15.8	0.0	148.1	75.2%
Iraq	52.4	9.4	7.3	0.2	69.3	89.2%	45.0	3.9	5.3	0.0	54.3	82.9%
Jordan	9.2	-	0.9	0.0	10.2	89.9%	0.1	0.4	1.1	-	1.5	5.6%
Kuwait	27.8	2.8	1.9	0.1	32.6	94.0%	15.1	0.1	1.1	0.0	16.3	92.8%
Lebanon	5.5	-	0.5	0.0	6.0	92.3%	0.1	0.2	1.0	-	1.2	5.9%
Oman	10.2	5.3	0.0	0.0	15.6	99.5%	24.6	0.4	0.5	-	25.4	96.6%
Qatar	12.4	2.6	1.9	0.0	17.0	88.5%	13.9	0.1	0.4	0.0	14.4	96.9%
Saudi Arabia	151.1	8.1	13.1	0.6	172.9	92.1%	57.3	2.2	6.4	0.1	66.0	86.8%
Syrian Arab Republic	27.2	3.7	1.7	0.2	32.9	94.0%	16.8	3.0	2.8	-	22.7	74.2%
United Arab Emirates	51.9	2.5	2.4	0.1	56.9	95.6%	21.1	0.3	0.7	-	22.1	95.2%
Yemen	6.3	0.0	0.5	0.0	6.9	91.8%	0.8	2.7	1.9	-	5.3	14.5%
Middle East	536.0	57.9	40.3	2.4	636.7	93.3%	308.0	34.3	37.2	0.1	379.6	81.1%

1. Please refer to the chapter Geographical coverage.

1990 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

Energy	N ₂ O					Share of energy	HFCs	PFCs	SF ₆	Total			
	Industrial processes	Agriculture	Other	Total	Industrial processes		Total	Share of energy	GHG / GDP PPP ²				
0.5	-	12.1	1.2	13.8	3.4%	-	-	-	127.4	12.3%	0.95	Bangladesh	
0.0	-	0.1	0.0	0.1	5.1%	-	-	-	7.3	96.2%	0.34	Brunei Darussalam	
0.1	-	2.1	0.3	2.4	2.2%	-	-	-	19.2	2.2%	..	Cambodia	
0.6	-	5.5	0.9	6.9	8.0%	-	-	-	164.2	82.0%	1.02	DPR of Korea	
9.9	1.1	119.9	19.2	150.1	6.6%	2.2	2.4	5.5	1 385.6	44.4%	0.93	India	
2.9	0.1	53.8	16.4	73.2	3.9%	-	0.8	1.0	467.8	49.2%	0.57	Indonesia	
0.2	-	7.2	1.4	8.9	2.8%	-	0.0	0.6	96.4	71.6%	0.52	Malaysia	
0.1	-	3.2	0.3	3.6	2.8%	-	-	-	25.9	52.5%	2.36	Mongolia	
0.4	-	8.4	1.6	10.5	4.1%	-	-	-	75.8	14.0%	2.56	Myanmar	
0.3	-	2.7	0.4	3.4	8.4%	-	-	-	28.8	10.0%	1.31	Nepal	
1.3	0.6	13.4	2.1	17.3	7.4%	-	-	1.0	186.3	37.7%	0.58	Pakistan	
0.6	-	7.0	1.3	8.9	7.0%	-	-	0.2	104.2	43.2%	0.43	Philippines	
0.1	-	0.0	0.7	0.8	8.3%	0.0	0.2	0.3	34.3	85.8%	0.33	Singapore	
0.2	-	1.4	0.3	1.9	11.6%	-	-	-	19.8	25.2%	0.32	Sri Lanka	
0.4	0.4	2.5	0.8	4.1	9.0%	0.0	0.2	1.9	143.0	79.4%	0.47	Chinese Taipei	
1.4	-	13.6	1.6	16.5	8.5%	-	-	1.4	209.6	46.8%	0.57	Thailand	
0.7	-	9.1	1.1	10.9	6.4%	-	-	-	102.6	23.2%	1.06	Viet Nam	
0.2	-	6.6	4.6	11.5	1.4%	-	-	-	50.7	23.2%	0.72	Other non-OECD Asia	
19.7	2.3	268.6	54.3	344.9	5.7%	2.2	3.5	11.8	3 248.6	46.1%	0.73	Asia (excl. China)	
23.6	16.8	246.4	32.0	318.7	7.4%	7.6	5.4	1.6	3 904.0	64.7%	2.30	People's Rep. of China	
0.1	-	0.0	0.3	0.4	34.4%	-	-	0.4	37.9	91.2%	0.25	Hong Kong, China	
23.7	16.8	246.4	32.3	319.2	7.4%	7.6	5.4	2.0	3 941.9	64.9%	2.13	China	
0.9	0.1	37.5	5.2	43.6	2.0%	0.3	2.3	0.1	312.6	45.9%	0.90	Argentina	
0.1	-	19.3	8.4	27.7	0.3%	-	-	-	88.7	14.2%	3.56	Bolivia	
4.1	1.1	115.9	31.8	153.0	2.7%	2.4	5.8	1.4	805.6	28.7%	0.53	Brazil	
0.6	0.2	15.5	0.9	17.1	3.4%	-	-	0.0	131.1	45.5%	0.52	Colombia	
0.0	0.1	1.6	0.1	1.8	1.7%	-	-	-	9.4	28.8%	0.40	Costa Rica	
0.5	0.7	6.7	0.5	8.4	6.1%	-	-	-	60.3	58.5%	0.43	Cuba	
0.0	-	0.0	0.0	0.0	25.0%	-	-	-	2.8	98.5%	1.81	Curaçao ¹	
0.1	-	1.6	0.2	1.9	3.8%	-	-	-	17.5	45.4%	0.47	Dominican Republic	
0.1	-	2.6	0.3	3.0	4.4%	-	-	-	45.9	68.9%	0.61	Ecuador	
0.1	-	1.1	0.1	1.2	5.6%	-	-	-	7.0	35.9%	0.30	El Salvador	
0.2	-	1.9	0.3	2.3	7.4%	-	-	-	12.2	35.2%	0.26	Guatemala	
0.1	-	0.7	0.1	0.9	6.3%	-	-	-	6.3	29.8%	0.45	Haiti	
0.1	-	1.7	0.1	1.9	4.4%	-	-	-	8.7	30.8%	0.56	Honduras	
0.1	-	0.3	0.1	0.4	12.2%	-	-	-	9.6	78.9%	0.55	Jamaica	
0.1	-	2.5	0.1	2.7	2.3%	-	-	-	10.0	22.4%	0.82	Nicaragua	
0.0	-	0.9	0.1	1.0	3.4%	-	-	-	6.9	39.3%	0.37	Panama	
0.1	-	15.7	5.0	20.8	0.6%	-	-	-	62.2	4.7%	2.49	Paraguay	
0.2	0.2	4.5	0.7	5.6	4.0%	-	-	-	45.5	51.1%	0.40	Peru	
0.0	-	0.1	0.1	0.2	12.0%	-	-	-	1.0	4.7%	..	Suriname	
0.0	-	5.6	0.1	5.8	0.7%	-	-	-	23.8	55.7%	1.62	Trinidad and Tobago	
0.3	0.0	9.1	1.2	10.7	3.1%	1.3	2.3	0.3	37.2	11.0%	1.24	Uruguay	
0.1	-	2.4	0.2	2.7	2.8%	-	-	0.0	159.6	75.5%	0.57	Venezuela	
0.1	-	2.4	0.2	2.7	2.8%	-	-	0.0	21.8	58.0%	0.71	Other non-OECD Americas	
7.8	2.3	249.7	55.7	315.6	2.5%	4.0	10.4	1.9	1 885.7	38.6%	0.62	Non-OECD Americas	
0.0	-	0.0	0.1	0.1	14.6%	-	3.0	-	17.4	72.6%	1.02	Bahrain	
1.9	0.3	14.0	4.4	20.6	9.0%	-	0.2	2.3	375.7	81.9%	0.62	Islamic Republic of Iran	
0.2	-	2.9	1.4	4.6	4.9%	-	-	0.2	128.4	83.4%	0.65	Iraq	
0.0	-	0.3	0.3	0.6	5.0%	-	-	-	12.3	76.5%	0.56	Jordan	
0.1	-	0.1	0.3	0.4	17.4%	-	-	0.3	49.5	92.5%	0.64	Kuwait	
0.0	-	0.2	0.2	0.5	6.0%	-	-	-	7.7	73.1%	0.37	Lebanon	
0.0	-	0.2	0.2	0.4	10.5%	-	-	-	41.4	96.8%	0.67	Oman	
0.0	-	0.0	0.1	0.2	17.4%	-	-	-	31.5	92.0%	0.96	Qatar	
0.5	-	3.1	2.4	6.0	9.0%	-	-	2.3	247.2	87.8%	0.36	Saudi Arabia	
0.2	0.2	3.1	0.9	4.4	4.3%	-	-	-	59.9	80.0%	1.12	Syrian Arab Republic	
0.1	-	0.2	0.5	0.8	14.2%	-	0.4	0.4	80.7	93.6%	0.40	United Arab Emirates	
0.0	-	1.7	0.7	2.5	1.2%	-	-	-	14.7	48.5%	0.37	Yemen	
3.2	0.5	25.9	11.4	40.9	7.7%	-	3.7	5.5	1 066.5	84.9%	0.53	Middle East	

1. Please refer to the chapter Geographical coverage.

2. GHG / GDP PPP ratio is expressed in kg of CO₂-equivalent per 2010 USD.

2000 Greenhouse-gas emissions

 million tonnes of CO₂ equivalent using GWP-100

	CO ₂						CH ₄					
	Fuel comb.	Fugitive	Industrial processes	Other	Total	Share of energy	Energy	Agricult.	Waste	Other	Total	Share of energy
World ¹	23 223.4	454.8	1 619.4	338.3	25 642.8	92.3%	2 401.7	3 767.5	1 484.4	95.6	7 749.1	31.0%
<i>Annex I Parties</i>	13 619.4	132.4	708.4	187.6	14 647.8	93.9%	768.1	836.7	597.6	31.2	2 233.6	34.4%
<i>Annex II Parties</i>	10 896.4	58.1	517.2	164.5	11 636.2	94.1%	460.0	657.0	436.2	10.8	1 564.1	29.4%
<i>North America</i>	6 246.1	29.6	210.0	105.6	6 591.4	95.2%	308.6	250.8	192.1	6.9	758.5	40.7%
<i>Europe</i>	3 161.9	22.4	203.9	50.2	3 438.5	92.6%	113.2	232.5	210.2	0.7	556.6	20.3%
<i>Asia Oceania</i>	1 488.3	6.1	103.3	8.6	1 606.3	93.0%	38.1	173.7	33.9	3.2	248.9	15.3%
<i>Annex I EIT</i>	2 513.3	71.8	168.3	21.6	2 775.0	93.2%	300.2	152.4	117.4	20.4	590.4	50.9%
<i>Non-Annex I Parties</i>	8 749.9	322.4	910.9	150.7	10 140.9	89.5%	1 622.6	2 930.8	886.8	64.3	5 504.5	29.5%
<i>Annex B Kyoto Parties</i>	4 656.0	78.3	302.3	66.5	5 103.1	92.8%	260.0	434.5	285.9	3.8	984.2	26.4%
Intl. aviation bunkers	355.6	-	-	-	355.6	100.0%	0.1	-	-	-	0.1	100.0%
Intl. marine bunkers	498.4	-	-	-	498.6	100.0%	10.9	-	-	-	10.9	100.0%
Non-OECD Total	9 840.3	372.6	974.5	158.5	11 352.6	90.0%	1 827.4	2 963.0	926.8	82.7	5 799.8	31.5%
OECD Total	12 529.1	82.3	644.9	179.8	13 436.0	93.9%	563.3	804.4	557.6	12.9	1 938.3	29.1%
Canada	516.3	6.2	29.6	3.5	555.5	94.0%	68.6	27.8	28.4	2.9	127.7	53.7%
Chile	48.6	0.9	3.9	0.3	53.8	92.1%	4.4	8.0	8.2	0.1	20.7	21.1%
Mexico	359.7	6.6	25.0	5.6	396.8	92.3%	37.0	64.0	23.0	1.8	125.7	29.4%
United States	5 729.9	23.4	180.4	102.2	6 035.8	95.3%	240.0	223.0	163.7	4.0	630.8	38.1%
OECD Americas	6 654.5	37.1	238.9	111.5	7 042.0	95.0%	350.0	322.8	223.3	8.8	904.9	38.7%
Australia	334.6	3.5	12.9	3.3	354.3	95.4%	30.9	107.8	15.3	2.9	157.0	19.7%
Israel ²	54.8	-	4.2	0.3	59.4	92.4%	0.2	1.2	3.8	0.0	5.2	3.3%
Japan	1 124.7	2.5	87.3	4.2	1 218.7	92.5%	6.0	37.9	14.1	0.1	58.1	10.3%
Korea	431.9	4.5	41.6	1.9	479.9	90.9%	5.6	15.8	15.8	0.1	37.3	15.0%
New Zealand	29.0	0.1	3.1	1.1	33.3	87.2%	1.2	28.0	4.5	0.1	33.9	3.7%
OECD Asia Oceania	1 975.1	10.6	149.1	10.8	2 145.6	92.5%	43.9	190.7	53.5	3.3	291.4	15.1%
Austria	61.8	0.4	4.6	1.2	68.0	91.4%	2.1	5.2	3.9	0.0	11.2	18.6%
Belgium	113.8	0.0	10.1	0.9	124.9	91.1%	4.6	7.8	4.9	0.0	17.3	26.4%
Czech Republic	121.2	2.3	5.9	1.2	130.7	94.6%	4.4	5.2	4.2	0.0	13.8	31.8%
Denmark	50.8	0.5	1.7	1.2	54.1	94.7%	1.2	6.4	1.7	-	9.3	13.0%
Estonia	14.4	0.5	0.8	0.2	15.9	94.2%	0.3	0.7	1.6	0.0	2.7	12.3%
Finland	54.6	0.4	2.4	0.7	58.0	94.7%	1.2	2.5	9.5	0.0	13.2	9.2%
France	364.7	1.4	27.2	7.3	400.5	91.4%	7.9	47.1	18.9	0.1	74.1	10.7%
Germany	812.3	6.4	39.8	13.0	871.5	93.9%	24.4	37.8	36.1	0.1	98.4	24.8%
Greece	87.9	0.1	7.9	1.2	97.1	90.6%	14.7	4.5	4.2	0.0	23.3	62.8%
Hungary	53.3	0.5	3.9	0.6	58.3	92.2%	2.3	3.5	3.9	0.0	9.7	23.4%
Iceland	2.2	-	0.7	0.0	2.9	75.4%	0.0	0.3	0.2	0.0	0.5	1.4%
Ireland	40.9	0.1	2.6	0.6	44.2	92.7%	2.0	14.5	1.8	-	18.4	10.7%
Italy	420.4	4.0	28.6	6.4	459.4	92.4%	7.0	22.0	25.5	0.1	54.5	12.8%
Latvia	6.8	0.0	0.4	0.3	7.6	90.5%	0.5	1.0	0.6	0.0	2.1	24.3%
Luxembourg	8.1	-	0.7	0.0	8.8	91.6%	0.1	0.4	0.1	-	0.6	11.1%
Netherlands	161.6	0.6	13.4	1.1	176.7	91.8%	6.2	12.1	11.1	0.1	29.6	20.9%
Norway	31.9	1.9	8.1	0.9	42.8	78.9%	14.1	2.6	3.0	0.1	19.9	71.1%
Poland	289.6	5.3	14.6	2.8	312.3	94.4%	38.5	17.5	13.8	0.0	69.9	55.1%
Portugal	57.9	0.2	5.8	0.7	64.5	90.0%	0.7	4.7	7.2	0.0	12.6	5.4%
Slovak Republic	36.9	1.0	4.2	0.1	42.1	89.9%	1.2	2.2	2.6	0.0	6.0	19.5%
Slovenia	14.1	-	1.0	0.6	15.7	89.7%	1.2	1.3	1.0	0.0	3.6	34.3%
Spain	278.6	2.3	24.8	6.2	311.9	90.1%	3.7	24.3	13.7	0.1	41.9	8.9%
Sweden	52.0	1.4	3.8	1.2	58.4	91.4%	0.9	3.9	8.9	0.0	13.7	6.7%
Switzerland	42.0	0.0	2.4	0.5	44.9	93.5%	0.5	3.7	1.1	-	5.3	8.9%
Turkey	201.2	2.5	22.2	1.4	227.4	89.6%	7.8	26.9	42.9	0.0	77.6	10.1%
United Kingdom	520.6	2.9	19.5	7.0	550.0	95.2%	22.0	32.5	58.3	0.1	112.9	19.5%
OECD Europe	3 899.5	34.6	256.8	57.5	4 248.4	92.6%	169.5	290.9	280.8	0.7	741.9	22.8%
<i>IEA/Accession/Association</i>	17 572.9	159.5	1 281.9	292.4	19 306.8	91.8%	1 194.3	2 344.8	1 052.6	45.0	4 636.7	25.8%
<i>European Union - 28</i>	3 786.1	32.1	240.8	56.7	4 115.7	92.8%	156.8	274.0	247.5	0.7	679.0	23.1%
<i>G20</i>	19 185.9	203.6	1 362.2	300.1	21 057.6	92.1%	1 445.7	2 369.8	1 107.6	64.7	4 987.8	29.0%
<i>Africa</i>	658.3	129.0	56.9	6.5	850.7	92.5%	429.9	589.7	135.0	14.3	1 168.9	36.8%
<i>Americas</i>	7 436.2	60.5	310.2	145.4	7 952.2	94.3%	487.2	895.4	346.9	35.8	1 765.2	27.6%
<i>Asia</i>	8 149.1	166.5	860.6	109.2	9 285.4	89.6%	1 021.6	1 731.0	643.6	18.9	3 415.2	29.9%
<i>Europe</i>	5 757.6	94.8	375.2	72.6	6 300.3	92.9%	417.0	395.2	334.4	21.2	1 167.8	35.7%
<i>Oceania</i>	363.6	3.6	16.0	4.4	387.6	94.7%	32.2	135.9	19.8	3.1	190.9	16.9%

1. Total World includes Non-OECD total, OECD total as well as international bunkers. 2. Please refer to the chapter Geographical coverage.

 Sources: IEA, CO₂ emissions from fuel combustion, EDGAR 4.3.2 FT2016, EDGAR 5.0 and 4.2 FT2010 databases for other emissions.

2000 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

Energy	N ₂ O					Share of energy	HFCs	PFCs	SF ₆	Total			
	Industrial processes	Agriculture	Other	Total	Industrial processes		Total	Share of energy	GHG / GDP PPP ³				
237.8	194.5	1 822.1	323.1	2 577.5	9.2%	341.3	125.6	111.7	36 548.1	72.0%	0.59	World ¹	
138.8	99.6	531.8	119.9	890.1	15.6%	259.9	93.2	80.7	18 205.2	80.5%	0.49	Annex I Parties	
122.0	68.0	417.7	83.9	691.6	17.6%	236.0	60.9	70.8	14 259.4	80.9%	0.44	Annex II Parties	
86.7	21.6	187.4	45.2	340.9	25.4%	137.3	28.2	48.5	7 904.8	84.4%	0.57	North America	
24.1	41.6	152.5	26.9	245.2	9.8%	60.5	17.9	14.9	4 333.6	76.7%	0.32	Europe	
11.2	4.7	77.8	11.8	105.5	10.6%	38.2	14.8	7.3	2 021.1	76.4%	0.40	Asia Oceania	
14.7	29.1	92.9	30.6	167.3	8.8%	22.6	31.7	9.0	3 596.0	80.6%	0.99	Annex I EIT	
92.2	94.9	1 290.3	184.4	1 661.8	5.5%	81.5	32.4	31.0	17 452.1	61.8%	0.70	Non-Annex I Parties	
36.5	61.6	278.8	40.2	417.1	8.7%	66.4	22.0	15.7	6 608.6	76.1%	0.41	Annex B Kyoto Parties	
3.0	-	-	2.2	5.2	57.3%	-	-	-	360.8	99.4%	..	Intl. aviation bunkers	
3.8	-	-	16.6	20.5	18.7%	-	-	-	530.0	96.9%	..	Intl. marine bunkers	
94.8	67.4	1 313.8	200.4	1 676.4	5.7%	86.5	59.0	34.2	19 008.6	63.9%	0.77	Non-OECD Total	
136.2	127.1	508.3	103.9	875.5	15.6%	254.8	66.6	77.5	16 648.7	80.0%	0.45	OECD Total	
7.2	1.3	21.9	5.8	36.3	20.0%	7.0	8.3	4.7	739.6	80.9%	0.65	Canada	
0.4	0.7	5.0	0.7	6.8	6.1%	-	-	0.0	81.3	66.8%	0.40	Chile	
2.7	41.0	32.1	5.7	81.4	3.3%	4.2	0.9	0.8	609.8	66.6%	0.40	Mexico	
79.4	20.3	165.5	39.4	304.7	26.1%	130.2	19.9	43.8	7 165.2	84.8%	0.56	United States	
89.8	63.3	224.5	51.6	429.2	20.9%	141.4	29.0	49.3	8 595.9	83.0%	0.55	OECD Americas	
3.1	1.7	59.0	4.1	67.9	4.6%	2.9	1.4	0.4	583.8	63.7%	0.84	Australia	
0.3	0.2	0.9	1.0	2.3	10.8%	0.8	0.1	1.0	68.7	80.4%	0.43	Israel ²	
7.7	3.1	8.4	7.3	26.5	29.1%	35.0	12.9	6.8	1 358.0	84.0%	0.32	Japan	
3.0	6.5	4.7	3.4	17.6	17.0%	10.6	2.7	3.9	552.0	80.6%	0.57	Korea	
0.4	-	10.4	0.3	11.1	3.2%	0.4	0.4	0.1	79.2	38.7%	0.76	New Zealand	
14.4	11.5	83.4	16.1	125.4	11.5%	49.6	17.6	12.2	2 641.8	77.4%	0.43	OECD Asia Oceania	
0.5	0.8	2.4	0.7	4.5	12.3%	1.2	0.2	0.3	85.3	76.0%	0.28	Austria	
0.7	4.6	3.0	0.8	9.1	7.5%	1.1	0.0	0.1	152.5	78.1%	0.41	Belgium	
1.5	1.2	3.1	0.9	6.7	22.4%	0.5	0.0	0.0	151.7	85.4%	0.71	Czech Republic	
0.5	1.0	4.7	0.5	6.6	7.3%	0.7	0.0	0.1	70.9	74.7%	0.32	Denmark	
0.1	-	0.5	0.1	0.8	14.9%	0.0	0.0	0.0	19.3	79.7%	0.93	Estonia	
1.5	1.2	3.1	0.6	6.3	23.1%	0.4	0.1	0.1	78.1	73.7%	0.44	Finland	
3.4	6.4	32.7	3.3	45.8	7.5%	11.0	1.6	2.3	535.4	70.5%	0.26	France	
5.2	4.4	29.4	5.3	44.4	11.7%	13.2	2.3	5.3	1 035.1	82.0%	0.35	Germany	
0.8	0.7	3.6	0.9	6.0	12.8%	2.9	0.4	0.1	129.9	79.6%	0.49	Greece	
0.3	1.7	3.9	0.5	6.4	5.2%	0.5	0.4	0.0	75.3	74.8%	0.43	Hungary	
0.0	-	0.3	0.0	0.4	4.7%	0.0	0.1	0.0	3.9	56.2%	0.41	Iceland	
0.3	0.7	6.9	0.3	8.2	3.7%	0.5	0.5	0.1	71.9	60.2%	0.49	Ireland	
2.6	7.8	14.0	4.1	28.6	9.2%	8.3	0.8	1.2	552.8	78.5%	0.27	Italy	
0.1	-	0.8	0.1	1.1	11.0%	0.2	0.0	-	10.9	68.3%	0.43	Latvia	
0.1	-	0.1	0.1	0.3	28.2%	0.1	0.0	-	9.7	84.4%	0.29	Luxembourg	
0.8	4.9	6.0	1.2	12.9	6.0%	7.6	1.3	0.3	228.3	74.1%	0.35	Netherlands	
0.3	1.7	1.8	0.4	4.2	7.1%	0.2	5.4	0.9	73.4	65.6%	0.30	Norway	
3.4	4.2	16.5	2.0	26.1	13.0%	0.8	0.6	0.2	409.8	82.2%	0.75	Poland	
0.7	0.3	2.7	0.7	4.4	15.5%	0.4	0.0	0.1	82.0	72.4%	0.31	Portugal	
0.3	1.0	1.2	0.3	2.8	11.2%	0.1	0.1	-	51.1	76.9%	0.61	Slovak Republic	
0.1	-	0.8	0.2	1.1	12.0%	0.2	0.2	0.0	20.7	74.5%	0.47	Slovenia	
2.4	2.4	17.2	3.2	25.2	9.6%	3.9	2.8	2.3	387.9	74.0%	0.32	Spain	
1.1	0.7	3.6	0.7	6.1	17.6%	0.6	0.8	0.2	79.9	69.3%	0.25	Sweden	
0.5	0.0	1.4	0.5	2.3	19.6%	1.0	0.1	0.3	53.9	79.7%	0.16	Switzerland	
2.0	2.5	21.0	5.4	30.8	6.4%	1.1	0.6	0.9	338.6	63.1%	0.40	Turkey	
2.9	3.8	19.5	3.9	30.1	9.5%	7.4	1.3	1.1	702.7	78.0%	0.36	United Kingdom	
32.0	52.3	200.4	36.2	320.9	10.0%	63.8	19.9	16.1	5 411.0	76.4%	0.35	OECD Europe	
190.8	203.2	1 174.5	202.5	1 771.0	10.8%	317.1	84.2	93.1	26 208.9	72.9%	0.53	IEA/Accession/Association	
30.4	53.7	187.4	32.0	303.5	10.0%	62.2	14.5	13.9	5 188.7	77.2%	0.36	European Union - 28	
196.6	172.1	1 207.4	224.9	1 801.0	10.9%	331.8	107.7	101.5	28 387.4	74.1%	0.56	G20	
15.6	6.0	336.4	29.5	387.5	4.0%	0.6	2.9	2.7	2 413.2	51.1%	0.89	Africa	
99.3	66.0	460.6	82.4	708.4	14.0%	142.7	34.6	50.5	10 653.6	75.9%	0.54	Americas	
73.0	49.6	698.0	127.4	947.9	7.7%	109.5	35.9	34.2	13 828.0	68.1%	0.65	Asia	
39.4	71.2	250.3	58.3	419.2	9.4%	85.2	50.3	23.9	8 046.7	78.4%	0.47	Europe	
3.5	1.7	69.4	4.4	79.0	4.4%	3.3	1.8	0.5	663.1	60.8%	0.80	Oceania	

1. Total World includes Non-OECD total, OECD total as well as international bunkers. 2. Please refer to the chapter Geographical coverage.

3. GHG / GDP PPP ratio is expressed in kg of CO₂-equivalent per 2010 USD.

2000 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

	CO ₂						CH ₄					
	Fuel comb.	Fugitive	Industrial processes	Other	Total	Share of energy	Energy	Agricult.	Waste	Other	Total	Share of energy
Non-OECD Total	9 840.3	372.6	974.5	158.5	11 352.6	90.0%	1 827.4	2 963.0	926.8	82.7	5 799.8	31.5%
Albania	3.1	0.0	0.1	0.1	3.3	94.6%	0.1	2.1	0.9	-	3.2	4.4%
Armenia	3.4	-	0.1	0.1	3.7	93.4%	0.3	1.1	0.2	-	1.6	19.4%
Azerbaijan	27.3	0.3	0.2	0.2	28.1	98.4%	3.6	4.8	1.5	0.0	9.9	36.0%
Belarus	52.1	0.2	3.4	2.0	57.8	90.5%	0.8	10.0	3.8	0.0	14.6	5.5%
Bosnia and Herzegovina	13.7	-	0.5	0.1	14.3	95.7%	0.9	1.4	0.3	0.0	2.7	35.1%
Bulgaria	42.2	1.0	4.4	0.3	47.8	90.2%	1.2	2.8	6.1	0.0	10.1	12.1%
Croatia	16.8	0.0	2.4	0.4	19.6	85.8%	1.1	1.4	1.0	0.0	3.6	32.3%
Cyprus ¹	6.3	-	0.7	0.0	7.0	89.8%	0.0	0.3	1.1	-	1.4	1.7%
FYR of Macedonia	8.5	0.0	0.5	0.0	9.0	94.4%	0.3	0.9	0.5	0.0	1.8	18.6%
Georgia	4.6	-	0.5	0.2	5.4	86.2%	0.5	2.6	0.4	0.0	3.5	13.0%
Gibraltar	0.3	-	0.0	-	0.3	99.7%	0.0	-	0.0	-	0.0	6.7%
Kazakhstan	112.0	8.7	5.0	0.6	126.3	95.6%	24.4	11.4	4.2	0.0	40.0	60.9%
Kosovo	5.1	-	-	-	5.1	100.0%	-	-	-	-	-	0.0%
Kyrgyzstan	4.5	-	0.2	0.2	4.9	91.5%	0.1	3.0	1.3	-	4.4	2.8%
Lithuania	10.2	0.0	1.3	0.3	11.8	86.7%	0.7	2.2	1.5	0.0	4.4	16.2%
Malta	2.1	-	0.0	0.0	2.2	98.5%	0.0	0.1	0.1	-	0.1	2.5%
Republic of Moldova	6.5	-	0.1	0.1	6.8	96.2%	0.4	1.3	0.4	-	2.1	18.2%
Montenegro	..	-	-	-	..	..	-	-	-	-	-	0.0%
Romania	86.2	1.0	8.7	1.0	96.9	90.0%	6.7	9.8	4.2	0.0	20.7	32.2%
Russian Federation	1 474.4	28.0	88.5	9.3	1 600.2	93.9%	208.8	70.0	62.3	20.2	361.3	57.8%
Serbia	42.9	0.6	1.8	0.4	45.7	95.3%	1.8	4.5	4.6	0.0	11.0	16.5%
Tajikistan	2.2	-	0.5	0.1	2.8	77.6%	0.1	2.5	0.7	-	3.4	3.7%
Turkmenistan	36.7	2.1	0.3	0.3	39.4	98.4%	19.4	5.2	0.7	-	25.3	76.7%
Ukraine	295.1	31.9	29.0	2.4	358.5	91.2%	32.5	24.7	10.7	0.1	68.0	47.8%
Uzbekistan	114.0	2.4	3.8	1.0	121.2	96.0%	24.1	12.7	3.1	-	39.8	60.6%
Non-OECD Europe and Eurasia	2 370.3	76.2	152.0	19.4	2 617.9	93.5%	328.0	174.8	109.7	20.5	632.9	51.8%
Algeria	61.5	17.5	5.1	0.3	84.5	93.5%	68.3	5.2	6.3	0.0	79.8	85.6%
Angola	4.6	11.8	0.1	0.0	16.6	98.9%	29.6	46.3	2.5	0.9	79.3	37.3%
Benin	1.4	-	0.1	0.0	1.6	90.6%	0.8	3.5	1.1	-	5.3	14.5%
Botswana	4.0	-	0.1	0.0	4.2	96.6%	0.5	5.5	0.4	0.0	6.4	7.8%
Cameroon	2.8	6.4	0.5	0.1	9.8	93.7%	15.2	14.9	2.7	1.8	34.7	43.9%
Congo	0.5	4.0	0.0	0.0	4.5	99.5%	9.4	1.8	0.6	0.1	11.8	79.6%
Côte d'Ivoire	6.3	0.2	0.3	0.2	6.9	93.7%	3.4	5.9	2.7	0.3	12.3	27.5%
Dem. Rep. of the Congo	0.9	0.8	0.1	0.2	2.0	85.1%	6.9	67.9	8.0	6.0	88.9	7.8%
Egypt	99.7	4.1	17.4	1.6	122.9	84.5%	15.9	16.0	10.8	0.0	42.7	37.2%
Eritrea	0.6	-	0.0	0.0	0.7	92.2%	0.3	2.6	0.5	-	3.4	8.9%
Ethiopia	3.2	-	0.4	0.1	3.7	86.4%	9.3	36.4	8.9	0.7	55.3	16.8%
Gabon	1.5	5.0	0.1	0.0	6.6	98.3%	11.4	0.3	0.3	-	12.0	94.8%
Ghana	5.0	-	1.1	0.1	6.1	81.3%	2.5	6.4	3.1	0.3	12.4	20.5%
Kenya	7.8	-	0.7	0.2	8.6	90.5%	7.9	15.2	4.5	0.2	27.7	28.3%
Libya	36.8	9.0	4.0	0.2	49.9	91.6%	24.3	0.9	1.6	0.0	26.8	90.5%
Mauritius	2.4	0.0	0.0	0.0	2.4	99.4%	0.1	0.1	0.2	-	0.4	25.2%
Morocco	29.6	-	5.5	0.4	35.5	83.2%	0.2	6.4	5.6	-	12.2	2.0%
Mozambique	1.3	-	0.2	0.1	1.6	82.3%	2.2	18.9	3.0	0.1	24.3	9.2%
Namibia	1.9	-	0.0	0.0	1.9	99.5%	0.1	5.7	0.3	-	6.0	1.0%
Niger	0.6	-	0.0	0.0	0.7	93.1%	1.0	9.6	1.6	-	12.2	8.6%
Nigeria	43.8	53.9	1.5	0.9	99.9	97.7%	143.5	34.5	18.3	0.3	196.6	73.0%
Senegal	3.5	-	0.4	0.1	4.0	87.3%	1.0	4.6	1.6	0.0	7.2	13.8%
South Africa	280.5	12.9	13.8	0.7	307.9	95.3%	33.5	25.1	13.5	0.2	72.3	46.3%
South Sudan	..	-	-	-	..	..	-	-	-	-	-	0.0%
Sudan	5.5	0.3	0.1	0.2	6.0	95.4%	7.7	67.4	5.5	0.3	80.9	9.5%
United Rep. of Tanzania	2.6	-	0.4	0.1	3.1	84.3%	5.4	26.7	5.2	0.2	37.5	14.5%
Togo	0.9	-	0.3	0.0	1.3	74.9%	1.3	1.6	0.7	0.0	3.7	36.0%
Tunisia	17.6	0.5	2.8	0.2	21.2	85.8%	3.1	2.5	2.1	-	7.7	40.1%
Zambia	1.7	-	0.3	0.0	2.0	84.8%	3.0	25.1	1.8	0.5	30.4	10.0%
Zimbabwe	13.3	0.3	1.0	0.1	14.6	93.1%	2.4	9.4	2.1	0.0	14.0	17.4%
Other Africa	16.4	2.4	0.7	0.5	20.0	93.8%	19.6	123.0	19.8	2.4	164.8	11.9%
Africa	658.3	129.0	56.9	6.5	850.7	92.5%	429.9	589.7	135.0	14.3	1 168.9	36.8%

1. Please refer to the chapter Geographical coverage.

2000 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

Energy	N ₂ O					Share of energy	HFCs	PFCs	SF ₆	Total			
	Industrial processes	Agriculture	Other	Total	Industrial processes		Total	Share of energy	GHG / GDP PPP ²				
94.8	67.4	1 313.8	200.4	1 676.4	5.7%	86.5	59.0	34.2	19 008.6	63.9%	0.77	Non-OECD Total	
0.1	-	0.7	0.1	0.8	7.1%	0.0	-	-	7.3	44.8%	0.43	Albania	
0.0	-	0.3	0.1	0.4	1.5%	0.0	-	-	5.8	65.0%	0.66	Armenia	
0.1	-	1.5	0.3	1.8	4.1%	0.0	0.0	-	39.9	78.4%	1.13	Azerbaijan	
0.4	0.3	7.8	0.5	9.0	4.6%	0.1	0.0	-	81.5	65.7%	1.10	Belarus	
0.1	-	0.8	0.2	1.0	7.9%	0.1	0.4	-	18.5	79.7%	0.81	Bosnia and Herzegovina	
0.3	0.6	2.1	0.4	3.4	8.2%	0.1	0.0	-	61.5	72.6%	0.86	Bulgaria	
0.2	0.8	1.5	0.2	2.7	5.9%	0.0	0.1	-	25.9	69.8%	0.39	Croatia	
0.0	-	0.2	0.1	0.3	8.2%	0.1	-	-	8.8	71.9%	0.43	Cyprus ¹	
0.1	-	0.5	0.1	0.6	8.8%	0.1	-	-	11.4	77.9%	0.66	FYR of Macedonia	
0.1	0.6	1.1	0.1	1.9	3.2%	0.0	-	-	10.8	47.9%	0.76	Georgia	
0.0	-	-	0.0	0.0	28.6%	-	-	-	0.4	94.5%	0.47	Gibraltar	
0.7	-	9.6	0.9	11.2	6.5%	0.1	-	-	177.6	82.1%	1.22	Kazakhstan	
-	-	-	-	-	0.0%	-	-	-	5.1	100.0%	0.67	Kosovo	
0.0	-	1.1	0.1	1.3	1.3%	0.0	-	-	10.5	43.6%	1.06	Kyrgyzstan	
0.1	1.3	2.0	0.2	3.5	2.9%	0.2	0.0	-	19.9	55.4%	0.49	Lithuania	
0.0	-	0.0	0.0	0.1	11.7%	0.1	-	-	2.4	89.1%	0.25	Malta	
0.0	-	0.6	0.1	0.7	5.2%	0.0	-	-	9.6	72.6%	1.16	Republic of Moldova	
-	-	-	-	-	0.0%	-	-	-	..	..	..	Montenegro
0.6	3.1	5.8	1.0	10.4	5.3%	0.1	0.8	0.0	128.9	73.2%	0.57	Romania	
6.3	10.8	35.3	22.4	74.7	8.4%	19.8	29.0	8.6	2 093.6	82.0%	1.15	Russian Federation	
0.2	0.5	2.5	0.4	3.6	7.0%	1.9	0.4	-	62.5	73.0%	1.09	Serbia	
0.0	-	0.9	0.1	1.0	0.2%	0.0	0.9	-	8.1	28.6%	1.12	Tajikistan	
0.1	0.5	1.9	0.2	2.7	2.1%	0.0	-	-	67.4	86.4%	2.86	Turkmenistan	
1.1	4.1	11.6	1.9	18.7	5.7%	0.1	0.4	0.1	445.7	80.9%	1.93	Ukraine	
0.5	0.1	7.2	0.6	8.4	5.8%	0.2	-	-	169.7	83.1%	2.81	Uzbekistan	
10.8	22.6	94.8	29.8	158.0	6.8%	22.9	32.1	8.8	3 472.7	80.2%	1.16	Non-OECD Europe and Eurasia	
0.2	0.6	2.7	0.8	4.3	4.9%	0.1	-	0.3	168.9	87.3%	0.54	Algeria	
0.3	-	29.3	0.9	30.5	0.9%	0.0	-	-	126.4	36.6%	2.24	Angola	
0.1	-	2.2	0.1	2.4	2.9%	-	-	-	9.3	24.4%	0.83	Benin	
0.1	-	3.0	0.1	3.2	1.8%	-	-	-	13.7	33.4%	0.78	Botswana	
0.3	-	9.0	1.5	10.7	2.6%	-	0.6	-	55.8	44.2%	1.43	Cameroon	
0.0	-	1.3	0.1	1.5	2.7%	0.0	-	-	17.9	78.3%	1.26	Congo	
0.2	-	3.9	0.5	4.6	4.0%	-	-	-	23.8	42.3%	0.49	Côte d'Ivoire	
0.8	-	43.2	4.5	48.5	1.6%	-	-	-	139.3	6.8%	5.71	Dem. Rep. of the Congo	
0.3	3.1	12.1	2.0	17.5	1.9%	0.1	1.6	1.1	185.8	64.6%	0.37	Egypt	
0.0	-	1.2	0.0	1.2	1.8%	-	-	-	5.3	17.7%	0.95	Eritrea	
1.2	-	19.3	1.7	22.1	5.3%	0.0	-	-	81.1	16.8%	2.01	Ethiopia	
0.1	-	0.2	0.1	0.4	20.0%	0.0	-	-	19.0	94.5%	0.89	Gabon	
0.3	-	3.8	0.5	4.7	6.2%	0.0	0.2	-	23.4	33.4%	0.56	Ghana	
0.4	-	8.0	0.7	9.2	4.8%	-	0.0	-	45.5	35.3%	0.69	Kenya	
0.2	-	0.7	0.4	1.2	13.0%	-	-	0.2	78.1	89.8%	0.68	Libya	
0.0	-	0.1	0.0	0.2	10.3%	0.0	-	-	3.0	84.4%	0.23	Mauritius	
0.3	-	4.4	0.7	5.4	5.1%	-	-	-	53.1	56.6%	0.41	Morocco	
0.3	-	12.6	0.5	13.3	1.9%	0.0	0.0	-	39.2	9.7%	3.94	Mozambique	
0.1	-	3.0	0.1	3.1	1.9%	-	-	-	11.1	18.3%	0.97	Namibia	
0.2	-	4.1	0.2	4.5	3.5%	-	-	-	17.3	10.6%	2.07	Niger	
4.1	-	17.1	3.7	24.9	16.3%	0.1	-	0.2	321.6	76.2%	0.94	Nigeria	
0.1	-	2.3	0.2	2.5	2.0%	-	-	-	13.7	33.4%	0.74	Senegal	
2.3	1.4	14.6	2.9	21.3	11.0%	0.3	0.5	1.0	403.3	81.6%	0.94	South Africa	
-	-	-	-	-	0.0%	-	-	-	..	..	..	South Sudan
0.4	-	35.1	0.9	36.3	1.0%	-	-	-	123.2	11.2%	1.62	Sudan	
0.6	-	14.7	1.0	16.2	3.6%	-	-	-	56.8	15.2%	1.18	United Rep. of Tanzania	
0.1	-	1.1	0.1	1.2	4.6%	-	-	-	6.2	37.9%	1.00	Togo	
0.2	0.4	1.5	0.3	2.4	8.2%	-	-	-	31.2	68.7%	0.43	Tunisia	
0.2	0.4	19.3	0.6	20.6	1.1%	-	-	-	52.9	9.3%	2.44	Zambia	
0.4	-	4.9	0.4	5.6	6.6%	-	-	-	34.2	47.9%	1.10	Zimbabwe	
2.2	-	61.8	4.2	68.3	3.3%	0.0	-	-	253.1	16.0%	1.49	Other Africa	
15.6	6.0	336.4	29.5	387.5	4.0%	0.6	2.9	2.7	2 413.2	51.1%	0.89	Africa	

1. Please refer to the chapter Geographical coverage.

2. GHG / GDP PPP ratio is expressed in kg of CO₂-equivalent per 2010 USD.

2000 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

	CO ₂						CH ₄					
	Fuel comb.	Fugitive	Industrial processes	Other	Total	Share of energy	Energy	Agricult.	Waste	Other	Total	Share of energy
Bangladesh	20.9	-	4.5	1.2	26.6	78.8%	5.5	77.6	16.9	0.4	100.3	5.5%
Brunei Darussalam	4.4	0.4	0.1	0.0	4.9	97.3%	4.8	0.0	0.1	0.0	4.9	98.0%
Cambodia	2.0	-	0.0	0.0	2.0	98.3%	1.7	14.6	1.7	0.1	18.1	9.3%
DPR of Korea	70.0	-	3.3	0.4	73.6	95.1%	11.6	4.7	5.8	0.2	22.3	52.1%
India	884.7	6.7	75.6	24.9	997.8	89.3%	87.1	445.6	139.7	3.1	675.5	12.9%
Indonesia	255.4	9.6	24.0	4.8	293.8	90.2%	74.7	89.3	45.1	4.8	213.9	34.9%
Malaysia	115.1	4.1	9.6	4.5	133.3	89.4%	26.4	6.1	5.2	0.4	38.1	69.2%
Mongolia	9.0	-	0.1	0.0	9.1	99.0%	0.3	10.3	0.4	0.7	11.8	2.6%
Myanmar	9.3	0.2	-0.2	0.3	9.5	99.2%	5.6	55.2	7.4	2.8	71.1	7.9%
Nepal	3.1	-	0.2	0.1	3.4	91.9%	2.2	20.8	2.7	0.2	25.9	8.5%
Pakistan	94.4	2.2	9.1	1.8	107.5	89.8%	20.6	92.0	18.9	-	131.4	15.7%
Philippines	68.1	0.0	6.0	1.6	75.7	90.0%	4.7	37.5	14.7	0.0	56.9	8.3%
Singapore	42.1	-	2.8	0.2	45.2	93.3%	0.4	0.0	1.4	0.0	1.8	22.3%
Sri Lanka	10.5	-	0.5	0.3	11.3	93.1%	1.2	7.4	2.4	0.0	11.0	11.0%
Chinese Taipei	214.4	1.0	14.8	1.3	231.5	93.0%	1.2	3.4	5.7	0.0	10.4	11.6%
Thailand	152.3	0.3	16.5	1.5	170.6	89.5%	17.4	66.4	12.1	0.2	96.2	18.1%
Viet Nam	44.2	1.4	7.9	1.4	55.0	83.0%	12.9	62.3	12.3	0.3	87.9	14.7%
Other non-OECD Asia	11.4	0.6	0.4	0.2	12.5	95.0%	2.8	20.4	4.6	2.4	30.2	9.2%
Asia (excl. China)	2 011.3	26.5	175.1	44.6	2 263.3	90.0%	281.2	1 013.9	297.0	15.7	1 607.7	17.5%
People's Rep. of China	3 099.7	46.3	459.3	50.5	3 655.8	86.1%	377.4	574.6	209.0	5.0	1 166.0	32.4%
Hong Kong, China	40.3	1.3	0.7	0.2	42.5	98.0%	0.1	0.0	1.9	-	2.1	6.0%
China	3 140.0	47.6	460.0	50.7	3 698.3	86.2%	377.5	574.6	211.0	5.0	1 168.1	32.3%
Argentina	139.4	2.1	4.8	4.3	150.5	94.0%	21.4	87.7	11.2	1.4	121.8	17.6%
Bolivia	7.1	0.7	0.4	0.0	8.3	94.6%	3.1	17.1	1.6	3.6	25.4	12.2%
Brazil	292.4	7.8	34.6	25.9	360.7	83.2%	38.6	297.7	64.9	17.2	418.4	9.2%
Colombia	54.2	1.9	5.0	0.7	61.8	90.8%	12.5	43.3	8.7	0.1	64.6	19.3%
Costa Rica	4.5	-	0.5	0.1	5.1	88.5%	0.1	2.6	0.8	0.0	3.4	1.5%
Cuba	27.3	0.2	1.1	0.2	28.9	95.5%	1.2	8.1	4.8	0.1	14.2	8.4%
Curaçao ¹	5.6	-	0.0	0.0	5.7	99.1%	0.1	0.0	0.0	-	0.1	88.2%
Dominican Republic	17.6	-	1.2	0.1	19.9	88.4%	0.3	4.4	2.7	0.0	7.5	4.4%
Ecuador	18.1	2.5	1.0	0.2	21.8	94.6%	6.4	9.5	2.5	0.0	18.4	34.8%
El Salvador	5.2	-	0.4	0.2	5.8	89.1%	0.4	1.7	1.0	0.0	3.1	12.5%
Guatemala	8.6	0.0	0.8	0.2	9.6	89.6%	1.2	6.7	1.9	2.3	12.0	9.9%
Haiti	1.4	-	0.2	0.0	1.6	85.9%	0.9	2.7	1.9	-	5.5	16.2%
Honduras	4.5	-	0.4	0.1	5.0	89.3%	0.4	3.2	1.0	0.2	4.8	7.7%
Jamaica	9.8	-	0.4	0.0	10.2	95.7%	0.6	0.8	0.7	-	2.0	27.2%
Nicaragua	3.5	-	0.2	0.0	3.8	94.2%	0.4	4.9	0.9	-	6.2	6.0%
Panama	4.9	-	0.3	0.0	5.2	93.7%	0.2	2.6	0.6	0.0	3.3	4.9%
Paraguay	3.3	-	0.3	0.2	3.8	87.4%	0.8	16.3	1.1	0.8	18.9	4.0%
Peru	26.4	0.4	1.7	0.3	28.9	92.8%	2.3	11.8	5.3	0.1	19.6	11.7%
Suriname	1.5	0.0	0.0	0.0	1.5	97.9%	0.0	0.5	0.1	0.0	0.6	6.0%
Trinidad and Tobago	10.1	0.2	8.7	0.0	19.0	54.2%	5.7	0.1	1.0	0.1	6.9	82.0%
Uruguay	5.1	0.0	0.3	0.1	5.4	93.9%	0.1	20.5	0.9	-	21.6	0.6%
Venezuela	116.2	7.5	8.0	0.8	132.6	93.3%	40.5	27.9	6.8	0.8	75.9	53.3%
Other non-OECD Americas	14.1	0.0	0.9	0.2	15.1	93.2%	0.2	2.5	3.0	0.2	5.9	4.0%
Non-OECD Americas	780.7	23.4	71.2	33.9	910.1	88.3%	137.2	572.5	123.6	27.0	860.3	15.9%
Bahrain	15.8	0.0	1.8	0.0	17.6	89.9%	2.5	0.0	0.4	0.0	2.9	83.9%
Islamic Republic of Iran	312.3	21.4	16.8	1.4	351.8	94.8%	78.0	23.1	20.5	0.0	121.6	64.1%
Iraq	70.5	14.1	1.5	0.4	86.5	97.8%	37.4	3.3	7.0	-	47.6	78.5%
Jordan	14.2	-	1.1	0.1	15.4	92.3%	0.2	0.4	1.8	-	2.3	6.6%
Kuwait	46.3	5.6	2.9	0.1	54.9	94.6%	19.9	0.1	1.1	0.0	21.1	94.2%
Lebanon	14.0	-	1.2	0.1	15.2	91.9%	0.1	0.3	1.2	-	1.6	6.4%
Oman	20.4	4.3	0.6	0.0	25.3	97.6%	15.3	0.6	0.7	-	16.6	92.3%
Qatar	21.3	6.6	3.9	0.0	31.7	87.6%	23.6	0.1	0.7	0.0	24.5	96.5%
Saudi Arabia	234.6	7.6	21.2	0.7	264.2	91.7%	51.3	2.6	9.2	0.2	63.3	81.1%
Syrian Arab Republic	37.0	6.1	2.2	0.4	45.7	94.3%	16.2	3.2	3.8	-	23.2	69.7%
United Arab Emirates	79.9	2.9	5.4	0.2	88.4	93.7%	25.0	0.6	1.3	0.0	26.9	92.9%
Yemen	13.3	1.4	0.7	0.0	15.5	95.1%	4.3	3.2	3.0	-	10.4	40.9%
Middle East	879.7	70.0	59.2	3.5	1 012.3	93.8%	273.6	37.5	50.5	0.3	362.0	75.6%

1. Please refer to the chapter Geographical coverage.

2000 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

Energy	N ₂ O					Share of energy	HFCs	PFCs	SF ₆	Total			
	Industrial processes	Agriculture	Other	Total	Industrial processes		Total	Share of energy	GHG / GDP PPP ²				
0.6	-	16.2	1.9	18.6	3.3%	-	-	-	145.6	18.6%	0.69	Bangladesh	
0.0	-	0.1	0.0	0.1	7.6%	0.1	-	-	10.1	95.5%	0.38	Brunei Darussalam	
0.1	-	2.3	0.3	2.7	5.5%	-	-	-	22.8	16.6%	1.39	Cambodia	
0.4	-	2.0	0.7	3.1	12.1%	2.0	-	-	100.9	81.2%	0.90	DPR of Korea	
13.2	1.6	147.1	22.3	184.1	7.2%	10.3	2.3	3.3	1 873.3	53.3%	0.73	India	
4.1	0.2	55.0	8.1	67.4	6.1%	-	0.2	0.8	576.1	59.7%	0.48	Indonesia	
0.5	0.5	7.5	1.3	9.8	5.0%	0.0	0.1	0.4	181.8	80.3%	0.49	Malaysia	
0.1	-	4.6	0.5	5.2	1.2%	-	-	-	26.0	35.9%	2.38	Mongolia	
0.5	-	11.8	2.6	14.9	3.6%	-	-	-	95.5	16.3%	1.62	Myanmar	
0.4	-	3.1	0.6	4.1	9.5%	-	-	-	33.3	17.1%	0.93	Nepal	
1.7	0.7	17.5	3.0	22.8	7.4%	-	-	0.3	262.1	45.3%	0.55	Pakistan	
0.6	0.0	8.6	1.7	10.9	5.7%	-	-	0.2	143.7	51.1%	0.45	Philippines	
0.1	5.4	0.0	0.9	6.4	1.8%	0.8	0.5	0.2	55.0	77.5%	0.27	Singapore	
0.3	-	1.4	0.5	2.1	12.9%	-	-	-	24.4	49.2%	0.24	Sri Lanka	
0.9	0.5	2.2	1.2	4.8	18.1%	0.1	5.3	1.5	253.7	85.7%	0.44	Chinese Taipei	
2.0	0.4	14.1	1.9	18.3	10.7%	-	-	0.4	285.4	60.3%	0.50	Thailand	
0.9	-	17.1	1.8	19.8	4.7%	-	-	-	162.7	36.6%	0.81	Viet Nam	
0.2	-	7.4	2.3	9.9	2.5%	0.0	-	-	52.7	28.4%	0.61	Other non-OECD Asia	
26.6	9.2	317.8	51.4	405.1	6.6%	13.3	8.4	7.2	4 305.1	54.6%	0.60	Asia (excl. China)	
27.8	26.3	297.6	43.2	394.8	7.0%	48.1	9.3	10.3	5 284.3	67.2%	1.15	People's Rep. of China	
0.2	-	0.0	0.4	0.5	31.3%	-	-	0.1	45.3	92.7%	0.20	Hong Kong, China	
28.0	26.3	297.6	43.5	395.4	7.1%	48.1	9.3	10.4	5 329.5	67.4%	1.11	China	
1.4	0.1	36.1	2.5	40.1	3.4%	0.1	0.2	0.2	312.8	52.5%	0.58	Argentina	
0.1	-	7.8	2.5	10.3	1.2%	-	-	-	44.0	25.1%	1.22	Bolivia	
5.0	1.6	118.9	17.1	142.5	3.5%	0.2	4.9	0.7	927.4	37.1%	0.47	Brazil	
0.6	0.3	16.1	1.1	18.0	3.2%	-	-	0.0	144.4	47.9%	0.44	Colombia	
0.1	0.1	1.3	0.1	1.5	5.2%	0.0	-	-	10.0	46.1%	0.26	Costa Rica	
0.3	0.6	5.2	0.4	6.6	4.6%	0.0	-	-	49.6	58.5%	0.41	Cuba	
0.0	-	0.0	0.0	0.1	30.2%	-	-	-	5.8	98.2%	2.77	Curaçao ¹	
0.1	-	1.5	0.3	2.0	7.0%	-	-	-	29.4	64.7%	0.44	Dominican Republic	
0.1	-	3.3	0.4	3.8	3.3%	0.0	-	-	44.0	61.7%	0.48	Ecuador	
0.1	-	1.0	0.2	1.3	7.1%	0.0	-	-	10.3	55.2%	0.28	El Salvador	
0.3	-	4.0	1.8	6.0	4.2%	0.2	-	-	27.8	36.1%	0.40	Guatemala	
0.1	-	1.2	0.1	1.4	5.2%	-	-	-	8.5	27.7%	0.58	Haiti	
0.1	-	2.9	0.3	3.3	2.6%	-	-	-	13.2	37.5%	0.62	Honduras	
0.1	-	0.4	0.2	0.6	8.6%	0.0	-	-	12.9	80.7%	0.62	Jamaica	
0.1	-	2.7	0.1	2.9	2.5%	-	-	-	12.8	31.1%	0.75	Nicaragua	
0.0	-	0.9	0.1	1.0	4.4%	-	-	-	9.6	53.2%	0.30	Panama	
0.1	-	6.7	0.7	7.5	1.7%	-	-	-	30.2	13.8%	0.95	Paraguay	
0.2	0.0	5.4	0.7	6.3	3.7%	0.1	-	-	54.9	53.5%	0.33	Peru	
0.0	-	0.1	0.1	0.2	12.1%	-	-	-	2.3	65.9%	0.51	Suriname	
0.0	-	5.9	0.1	6.0	0.7%	0.0	-	-	32.0	50.0%	1.41	Trinidad and Tobago	
0.5	0.0	10.3	1.5	12.2	3.7%	0.6	0.6	0.2	40.6	14.1%	0.97	Uruguay	
0.1	-	2.3	0.4	2.8	5.2%	0.0	-	0.0	211.3	77.8%	0.61	Venezuela	
0.1	-	2.3	0.4	2.8	5.2%	0.0	-	0.0	23.9	60.6%	0.68	Other non-OECD Americas	
9.6	2.7	236.1	30.9	279.2	3.4%	1.3	5.6	1.2	2 057.7	46.3%	0.51	Non-OECD Americas	
0.0	-	0.0	0.1	0.1	19.3%	-	0.3	-	21.0	87.5%	0.72	Bahrain	
2.0	0.5	17.8	5.7	26.1	7.8%	-	0.2	1.6	501.3	82.5%	0.60	Islamic Republic of Iran	
0.3	-	3.3	1.9	5.5	5.7%	-	-	0.1	139.8	87.5%	0.50	Iraq	
0.0	-	0.3	0.4	0.7	6.3%	0.0	-	-	18.5	78.1%	0.51	Jordan	
0.1	-	0.1	0.3	0.6	23.6%	0.2	-	0.3	77.0	93.3%	0.55	Kuwait	
0.1	-	0.3	0.3	0.7	10.4%	-	-	-	17.5	80.8%	0.44	Lebanon	
0.1	-	0.3	0.2	0.6	10.6%	0.0	-	-	42.5	94.3%	0.44	Oman	
0.1	-	0.1	0.1	0.3	24.4%	-	-	-	56.5	91.2%	0.90	Qatar	
0.8	-	2.9	3.1	6.8	12.2%	0.1	-	1.2	335.6	87.7%	0.38	Saudi Arabia	
0.3	0.2	3.5	1.2	5.1	5.1%	-	-	-	74.0	80.5%	0.87	Syrian Arab Republic	
0.2	-	0.5	0.7	1.3	12.6%	-	0.3	0.6	117.5	91.9%	0.37	United Arab Emirates	
0.2	-	2.0	1.1	3.3	6.3%	-	-	-	29.3	65.7%	0.43	Yemen	
4.2	0.6	31.1	15.3	51.2	8.2%	0.3	0.7	3.9	1 430.4	85.8%	0.50	Middle East	

1. Please refer to the chapter Geographical coverage.

2. GHG / GDP PPP ratio is expressed in kg of CO₂-equivalent per 2010 USD.

2010 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

	CO ₂						CH ₄					
	Fuel comb.	Fugitive	Industrial processes	Other	Total	Share of energy	Energy	Agricult.	Waste	Other	Total	Share of energy
World ¹	30 489.9	445.3	2 533.2	322.3	33 755.2	91.6%	3 012.5	4 108.6	1 675.5	162.6	8 959.3	33.6%
<i>Annex I Parties</i>	13 224.1	103.7	696.5	147.5	14 171.4	94.0%	815.5	772.1	569.2	46.0	2 202.8	37.0%
<i>Annex II Parties</i>	10 397.8	51.3	473.6	129.1	11 051.3	94.6%	440.0	613.7	375.6	24.7	1 454.0	30.3%
<i>North America</i>	5 881.6	29.8	175.7	73.0	6 159.6	96.0%	295.9	257.1	188.4	23.3	764.7	38.7%
<i>Europe</i>	2 992.6	17.1	191.8	46.1	3 247.7	92.7%	99.3	215.8	158.4	0.5	474.0	21.0%
<i>Asia Oceania</i>	1 523.6	4.4	106.1	9.9	1 644.1	92.9%	44.7	140.8	28.8	0.9	215.3	20.8%
<i>Annex I EIT</i>	2 548.6	51.2	182.5	15.9	2 798.3	92.9%	362.2	131.6	143.5	21.3	658.6	55.0%
<i>Non-Annex I Parties</i>	16 145.6	341.6	1 836.7	174.8	18 463.0	89.3%	2 184.7	3 336.5	1 106.3	116.6	6 744.2	32.4%
<i>Annex B Kyoto Parties</i>	4 632.0	51.9	295.7	61.9	5 041.5	92.9%	263.7	382.0	241.0	1.4	888.1	29.7%
Intl. aviation bunkers	457.6	-	-	-	457.6	100.0%	0.1	-	-	-	0.1	100.0%
Intl. marine bunkers	662.7	-	-	-	663.2	99.9%	12.2	-	-	-	12.2	100.0%
Non-OECD Total	17 031.7	374.2	1 911.3	177.3	19 458.9	89.4%	2 450.6	3 345.1	1 167.5	136.8	7 100.1	34.5%
OECD Total	12 338.0	71.1	621.9	145.0	13 175.5	94.2%	549.6	763.5	508.0	25.8	1 846.9	29.8%
Canada	529.5	6.7	26.4	3.3	565.9	94.8%	61.6	26.9	27.3	20.1	135.9	45.3%
Chile	68.6	0.2	5.1	0.3	74.2	92.8%	3.3	7.6	10.3	0.2	21.4	15.6%
Mexico	440.5	7.3	25.2	6.3	479.2	93.4%	43.7	66.2	26.1	0.7	136.7	31.9%
United States	5 352.1	23.1	149.3	69.7	5 593.7	96.1%	234.3	230.2	161.1	3.2	628.8	37.3%
OECD Americas	6 390.7	37.3	205.9	79.6	6 712.9	95.8%	342.9	330.8	224.8	24.2	922.7	37.2%
Australia	389.1	3.3	16.5	4.4	413.3	94.9%	38.7	77.0	15.0	0.7	131.4	29.5%
Israel ²	68.4	0.1	3.3	0.4	72.2	94.9%	1.4	1.4	4.4	0.0	7.1	19.0%
Japan	1 104.2	1.0	87.6	3.9	1 196.7	92.4%	4.7	34.7	9.5	0.1	49.0	9.5%
Korea	550.9	4.0	43.9	1.9	600.8	92.4%	4.4	17.4	14.8	0.1	36.7	12.1%
New Zealand	30.4	0.1	2.0	1.5	34.0	89.4%	1.4	29.1	4.3	0.1	34.9	4.0%
OECD Asia Oceania	2 143.0	8.5	153.3	12.2	2 317.1	92.9%	50.5	159.6	48.0	1.0	259.1	19.5%
Austria	68.3	0.3	5.0	1.2	74.8	91.7%	2.4	4.9	3.1	0.0	10.5	23.2%
Belgium	103.7	0.5	10.7	0.8	115.7	90.1%	6.5	6.7	3.6	0.0	16.9	38.7%
Czech Republic	112.6	1.7	5.3	0.7	120.2	95.0%	3.8	4.3	4.8	0.0	12.9	29.5%
Denmark	47.3	0.2	0.9	0.6	49.0	96.8%	1.5	6.5	1.4	-	9.3	16.0%
Estonia	18.6	0.3	0.3	0.1	19.3	97.8%	0.4	0.7	1.7	0.0	2.8	14.7%
Finland	62.0	0.4	2.6	0.4	65.4	95.4%	4.5	2.3	7.7	0.0	14.5	30.8%
France	341.0	2.0	28.1	5.8	376.9	91.0%	7.5	44.1	17.3	0.1	68.9	10.9%
Germany	758.8	5.5	39.6	12.1	816.0	93.7%	13.9	35.3	21.8	0.2	71.2	19.6%
Greece	83.4	0.0	5.9	1.1	90.3	92.3%	14.6	4.4	4.6	0.0	23.6	61.9%
Hungary	47.1	0.4	3.4	0.4	51.4	92.6%	2.3	2.9	4.0	0.0	9.3	24.6%
Iceland	1.9	-	1.7	0.0	3.7	53.1%	0.0	0.3	0.2	0.0	0.5	0.8%
Ireland	39.5	1.0	1.3	0.6	42.4	95.6%	2.2	13.6	1.3	-	17.1	13.1%
Italy	392.0	1.3	27.5	6.2	427.0	92.1%	6.8	20.0	18.2	0.0	45.1	15.2%
Latvia	8.1	-	0.4	0.4	8.9	90.8%	0.6	1.0	0.6	0.0	2.3	26.6%
Luxembourg	10.7	-	0.6	0.0	11.2	94.7%	0.1	0.4	0.1	-	0.6	10.5%
Netherlands	170.1	0.7	13.2	1.6	185.6	92.0%	6.5	11.9	5.7	0.1	24.2	26.7%
Norway	38.4	0.9	7.5	0.8	47.6	82.5%	16.0	2.5	2.5	0.1	21.1	75.8%
Poland	307.5	3.6	14.7	2.2	328.1	94.8%	33.6	18.9	13.1	0.0	65.7	51.2%
Portugal	47.6	0.0	5.2	0.7	53.5	88.9%	0.8	4.1	7.4	0.0	12.4	6.8%
Slovak Republic	34.6	1.1	5.1	0.1	40.9	87.1%	1.2	1.7	3.1	0.0	6.0	20.4%
Slovenia	15.4	-	1.8	0.6	17.9	86.4%	1.5	1.4	0.7	0.0	3.6	43.4%
Spain	262.1	0.2	20.3	5.5	288.1	91.0%	3.0	23.2	16.4	0.1	42.7	7.1%
Sweden	46.1	1.4	4.1	1.8	53.4	88.9%	1.1	3.6	7.9	0.0	12.5	8.5%
Switzerland	43.3	0.0	2.6	0.6	46.5	93.1%	0.7	3.7	6.6	-	11.1	6.6%
Turkey	267.8	1.2	39.7	2.5	311.1	86.5%	13.3	26.5	48.6	0.0	88.4	15.0%
United Kingdom	476.6	2.7	15.1	6.2	500.6	95.7%	11.1	28.3	32.5	0.1	71.9	15.4%
OECD Europe	3 804.3	25.3	262.7	53.2	4 145.5	92.4%	156.1	273.2	235.1	0.6	665.0	23.5%
<i>IEA/Accession/Association</i>	23 065.4	200.0	1 991.7	270.9	25 528.0	91.1%	1 562.6	2 482.3	1 126.0	92.0	5 262.9	29.7%
<i>European Union - 28</i>	3 612.4	24.0	226.2	51.5	3 914.0	92.9%	135.8	255.9	192.4	0.6	584.7	23.2%
<i>G20</i>	24 922.3	253.6	2 116.9	276.6	27 531.4	91.4%	1 877.5	2 478.0	1 192.4	113.5	5 661.3	33.2%
<i>Africa</i>	995.4	105.0	86.9	9.0	1 196.5	92.0%	437.5	682.1	177.6	13.0	1 310.1	33.4%
<i>Americas</i>	7 410.6	53.7	308.8	111.8	7 884.8	94.7%	498.3	1 028.7	378.3	101.9	2 007.2	24.8%
<i>Asia</i>	14 843.7	213.8	1 738.5	132.6	16 928.6	88.9%	1 554.9	1 909.1	784.2	20.5	4 268.7	36.4%
<i>Europe</i>	5 642.0	69.3	379.1	62.8	6 153.2	92.8%	465.5	355.9	310.0	21.8	1 153.2	40.4%
<i>Oceania</i>	419.4	3.4	18.6	6.0	447.3	94.5%	40.1	106.1	19.3	0.7	166.2	24.1%

1. Total World includes Non-OECD total, OECD total as well as international bunkers. 2. Please refer to the chapter Geographical coverage.

Sources: IEA, CO₂ emissions from fuel combustion, EDGAR 4.3.2 FT2016, EDGAR 5.0 and 4.2 FT2010 databases for other emissions.

2010 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

Energy	N ₂ O					Share of energy	HFCs	PFCs	SF ₆	Total			
	Industrial processes	Agriculture	Other	Total	Industrial processes		Total	Share of energy	GHG / GDP PPP ³				
278.2	172.2	2 099.9	407.1	2 957.4	9.4%	746.6	60.5	157.3	46 636.4	73.3%	0.52	World ¹	
121.1	85.1	516.1	118.7	841.0	14.4%	488.7	43.2	73.7	17 820.7	80.0%	0.40	Annex I Parties	
103.2	46.2	404.5	81.9	635.9	16.2%	439.3	26.8	62.0	13 669.2	80.4%	0.37	Annex II Parties	
68.8	18.9	200.8	49.9	338.3	20.3%	284.1	11.1	45.0	7 602.7	82.5%	0.47	North America	
23.6	23.7	141.7	23.0	212.0	11.1%	102.4	8.0	12.4	4 056.5	77.2%	0.27	Europe	
10.8	3.7	62.0	9.1	85.6	12.7%	52.7	7.8	4.7	2 010.0	78.8%	0.36	Asia Oceania	
14.7	37.4	90.6	30.7	173.4	8.5%	44.3	16.1	9.8	3 700.5	80.4%	0.66	Annex I EIT	
148.1	87.1	1 583.8	263.3	2 082.3	7.1%	258.0	17.4	83.6	27 648.4	67.9%	0.61	Non-Annex I Parties	
37.3	44.6	256.0	35.6	373.5	10.0%	124.8	9.5	13.7	6 451.1	77.3%	0.33	Annex B Kyoto Parties	
3.9	-	-	2.9	6.7	57.3%	-	-	-	464.4	99.4%	..	Intl. aviation bunkers	
5.1	-	-	22.2	27.3	18.7%	-	-	-	702.8	96.8%	..	Intl. marine bunkers	
148.7	46.0	1 602.9	279.6	2 077.2	7.2%	277.5	30.8	85.8	29 030.2	68.8%	0.64	Non-OECD Total	
120.6	126.1	497.0	102.4	846.1	14.3%	469.2	29.8	71.5	16 438.9	79.6%	0.38	OECD Total	
6.0	0.8	23.7	16.4	46.9	12.8%	17.0	3.8	4.0	773.6	78.0%	0.57	Canada	
0.5	0.7	5.8	0.9	7.8	6.6%	-	-	0.0	103.3	70.3%	0.33	Chile	
3.7	69.0	33.3	5.5	111.4	3.3%	11.0	0.1	0.5	739.0	67.0%	0.42	Mexico	
62.8	18.1	177.2	33.4	291.4	21.5%	267.1	7.3	40.9	6 829.2	83.1%	0.46	United States	
73.0	88.5	239.9	56.2	457.6	15.9%	295.2	11.2	45.4	8 445.0	81.0%	0.46	OECD Americas	
3.5	1.8	42.5	2.8	50.6	7.0%	8.7	0.5	0.6	605.0	71.8%	0.64	Australia	
0.2	0.0	0.9	1.1	2.3	10.7%	2.0	0.1	0.6	84.3	83.1%	0.38	Israel ²	
7.0	1.9	7.7	6.0	22.5	31.0%	42.8	7.1	4.1	1 322.3	84.5%	0.29	Japan	
3.6	1.1	5.3	3.0	13.0	27.5%	3.2	1.9	6.1	661.8	85.1%	0.44	Korea	
0.3	-	11.8	0.3	12.4	2.6%	1.1	0.1	0.1	82.7	38.9%	0.61	New Zealand	
14.7	4.7	68.3	13.1	100.8	14.5%	57.9	9.8	11.5	2 756.1	80.4%	0.38	OECD Asia Oceania	
0.7	0.3	2.2	0.6	3.8	18.2%	2.9	0.2	0.2	92.4	77.6%	0.26	Austria	
0.7	4.6	2.8	0.8	8.8	7.7%	2.9	0.0	0.1	144.4	77.2%	0.33	Belgium	
1.5	0.6	3.0	0.8	6.0	24.8%	1.7	0.0	0.0	140.9	84.8%	0.49	Czech Republic	
0.5	0.0	4.4	0.5	5.4	10.0%	1.9	0.0	0.0	65.8	75.3%	0.28	Denmark	
0.2	-	0.5	0.1	0.8	21.0%	0.1	0.0	0.0	22.9	84.7%	0.80	Estonia	
2.1	1.3	2.7	0.5	6.6	32.2%	1.2	0.0	0.1	87.8	78.5%	0.42	Finland	
3.5	2.5	32.5	3.0	41.5	8.4%	20.3	0.6	1.8	509.9	69.4%	0.22	France	
4.6	3.5	28.9	4.1	41.1	11.3%	21.9	1.2	6.5	957.9	81.7%	0.30	Germany	
0.6	0.4	3.2	0.8	5.0	12.6%	1.2	0.1	0.1	120.4	81.9%	0.38	Greece	
0.3	1.3	3.6	0.6	5.8	5.8%	1.9	0.0	0.0	68.5	73.3%	0.32	Hungary	
0.0	0.0	0.3	0.0	0.4	3.5%	0.1	0.1	0.0	4.7	41.8%	0.38	Iceland	
0.3	-	6.6	0.3	7.1	3.6%	1.4	0.2	0.1	68.2	63.1%	0.35	Ireland	
2.9	0.4	11.7	3.2	18.2	16.1%	14.0	0.6	1.0	505.8	79.7%	0.24	Italy	
0.1	-	0.9	0.1	1.2	12.1%	1.4	0.0	-	13.8	63.9%	0.37	Latvia	
0.1	-	0.1	0.1	0.3	32.2%	0.2	0.0	-	12.2	88.2%	0.28	Luxembourg	
0.8	1.3	5.7	1.0	8.7	8.7%	4.7	0.3	0.1	223.7	79.6%	0.30	Netherlands	
0.3	1.0	1.8	0.4	3.5	9.1%	0.5	2.4	0.2	75.2	73.9%	0.26	Norway	
3.7	4.6	16.5	2.0	26.8	13.7%	2.8	0.3	0.3	423.9	82.2%	0.53	Poland	
0.5	0.5	2.4	0.5	3.9	12.8%	1.0	0.0	0.1	70.9	69.0%	0.25	Portugal	
0.3	1.2	1.2	0.3	3.0	9.9%	0.5	0.1	-	50.4	73.6%	0.37	Slovak Republic	
0.1	-	0.6	0.2	0.9	14.9%	0.6	0.1	0.0	23.0	74.5%	0.40	Slovenia	
2.3	1.2	15.5	2.7	21.7	10.5%	10.3	1.3	0.9	365.0	73.3%	0.24	Spain	
1.1	5.3	3.2	0.7	10.2	10.7%	1.8	0.4	0.1	78.5	63.3%	0.20	Sweden	
0.3	0.1	1.3	0.4	2.2	16.1%	2.5	0.1	0.5	62.7	70.7%	0.15	Switzerland	
3.1	1.4	20.8	6.0	31.3	9.9%	4.6	0.3	1.9	437.7	65.2%	0.35	Turkey	
2.2	1.4	16.5	3.5	23.7	9.4%	13.8	0.4	0.5	610.9	80.6%	0.27	United Kingdom	
33.0	32.9	188.8	33.1	287.7	11.5%	116.1	8.8	14.6	5 237.7	76.7%	0.29	OECD Europe	
219.8	198.9	1 338.7	251.4	2 008.8	10.9%	694.1	39.9	129.3	33 663.0	74.4%	0.49	IEA/Accession/Association	
30.3	36.3	176.8	28.1	271.5	11.2%	111.3	6.2	12.0	4 899.8	77.6%	0.29	European Union - 28	
222.3	151.3	1 373.3	274.2	2 021.2	11.0%	714.9	52.4	140.2	36 121.4	75.4%	0.51	G20	
20.8	7.3	383.5	34.9	446.5	4.7%	2.5	1.4	4.2	2 961.1	52.6%	0.65	Africa	
86.0	90.2	560.6	123.6	860.4	10.0%	302.4	14.3	47.6	11 116.8	72.4%	0.46	Americas	
119.2	11.6	855.5	161.9	1 148.2	10.4%	276.8	20.0	82.7	22 725.1	73.6%	0.60	Asia	
39.0	61.3	236.9	54.6	391.8	10.0%	154.9	24.2	22.2	7 899.6	78.7%	0.37	Europe	
3.9	1.8	54.3	3.1	63.0	6.1%	9.8	0.6	0.6	687.7	67.9%	0.61	Oceania	

1. Total World includes Non-OECD total, OECD total as well as international bunkers. 2. Please refer to the chapter Geographical coverage.

3. GHG / GDP PPP ratio is expressed in kg of CO₂-equivalent per 2010 USD.

2010 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

	CO ₂						CH ₄					
	Fuel comb.	Fugitive	Industrial processes	Other	Total	Share of energy	Energy	Agricult.	Waste	Other	Total	Share of energy
Non-OECD Total	17 031.7	374.2	1 911.3	177.3	19 458.9	89.4%	2 450.6	3 345.1	1 167.5	136.8	7 100.1	34.5%
Albania	3.9	0.0	0.6	0.1	4.6	85.7%	0.2	1.7	0.9	0.0	2.8	6.3%
Armenia	4.0	-	0.2	0.2	4.5	90.8%	0.4	1.3	0.2	0.0	1.9	21.4%
Azerbaijan	23.5	0.4	0.6	0.2	24.8	96.5%	9.2	6.7	1.9	0.0	17.8	51.8%
Belarus	59.5	4.3	5.0	1.7	70.6	90.4%	0.8	10.3	7.9	0.0	19.0	4.2%
Bosnia and Herzegovina	20.5	0.6	1.0	0.1	22.2	94.9%	1.4	1.5	0.9	0.0	3.8	37.5%
Bulgaria	44.4	0.4	3.9	0.2	48.8	91.6%	1.2	2.0	5.7	0.0	8.9	13.6%
Croatia	18.2	0.1	2.4	0.7	21.5	85.1%	1.7	1.4	1.3	0.0	4.4	38.1%
Cyprus ¹	7.3	-	0.7	0.0	8.0	91.0%	0.0	0.3	1.3	-	1.6	0.9%
FYR of Macedonia	8.3	0.0	0.8	0.0	9.2	90.9%	0.3	0.7	1.0	0.0	2.1	16.0%
Georgia	5.0	0.0	1.1	0.2	6.2	80.3%	0.4	2.1	0.4	0.0	3.0	15.0%
Gibraltar	0.5	-	0.0	-	0.5	99.8%	0.0	-	0.0	-	0.0	6.3%
Kazakhstan	221.1	5.8	9.1	0.6	236.6	95.9%	35.7	17.2	4.9	0.0	57.8	61.8%
Kosovo	8.7	-	-	-	8.7	100.0%	-	-	-	-	-	0.0%
Kyrgyzstan	6.0	-	0.3	0.2	6.6	92.1%	0.2	3.9	1.3	-	5.4	2.9%
Lithuania	12.3	0.0	1.2	0.3	13.8	89.2%	0.8	2.1	1.5	0.0	4.4	17.7%
Malta	2.6	-	0.0	0.0	2.6	98.2%	0.0	0.1	0.1	-	0.2	1.1%
Republic of Moldova	7.9	-	0.4	0.1	8.4	94.0%	0.4	1.0	0.5	-	1.8	22.2%
Montenegro	2.6	-	-	-	2.6	100.0%	-	-	-	-	-	0.0%
Romania	74.7	0.3	6.7	1.0	82.7	90.8%	6.0	9.9	5.4	0.0	21.3	28.0%
Russian Federation	1 529.2	25.5	105.0	5.3	1 664.9	93.4%	272.3	59.9	82.2	21.1	435.5	62.5%
Serbia	45.8	0.4	2.0	0.3	48.6	95.2%	1.6	3.7	4.5	0.0	9.9	16.5%
Tajikistan	2.3	-	0.7	0.1	3.1	73.6%	0.2	4.4	0.9	-	5.5	3.8%
Turkmenistan	56.9	3.2	1.1	0.4	61.6	97.5%	22.0	8.5	0.9	-	31.4	70.2%
Ukraine	266.3	13.7	27.1	2.2	309.3	90.5%	36.0	15.2	11.4	0.1	62.6	57.5%
Uzbekistan	97.6	2.8	6.6	1.0	108.0	92.9%	26.0	20.5	3.9	0.0	50.4	51.6%
Non-OECD Europe and Eurasia	2 529.3	57.3	176.6	15.1	2 778.3	93.1%	416.8	174.2	139.1	21.3	751.5	55.5%
Algeria	95.5	11.4	9.1	0.4	116.4	91.8%	57.9	6.1	7.8	0.0	71.9	80.5%
Angola	15.1	8.3	0.5	0.1	24.0	97.5%	26.3	52.5	3.9	1.9	84.7	31.1%
Benin	4.6	-	0.5	0.1	5.1	89.6%	1.1	3.4	1.6	-	6.0	17.9%
Botswana	3.3	-	0.2	0.0	3.5	94.3%	0.5	6.8	0.5	-	7.8	6.9%
Cameroon	5.1	5.0	0.5	0.2	10.8	93.8%	12.3	10.9	3.7	0.3	27.2	45.2%
Congo	1.8	3.5	0.0	0.0	5.4	99.1%	8.7	2.3	0.8	0.1	12.0	72.8%
Côte d'Ivoire	6.2	0.2	0.7	0.3	7.4	86.7%	4.7	4.7	3.0	0.0	12.4	37.8%
Dem. Rep. of the Congo	1.9	0.7	0.2	0.2	3.1	85.1%	8.7	62.3	11.6	5.6	88.2	9.8%
Egypt	176.5	3.3	29.1	2.9	211.7	84.9%	27.6	16.3	12.9	0.0	56.8	48.6%
Eritrea	0.5	-	0.0	0.0	0.5	95.2%	0.4	2.6	0.7	-	3.7	11.8%
Ethiopia	6.0	-	0.7	0.2	6.9	87.1%	20.6	57.7	12.0	0.3	90.5	22.7%
Gabon	2.7	3.3	0.1	0.0	6.1	98.3%	8.0	0.3	0.4	-	8.7	91.7%
Ghana	10.5	0.3	0.8	0.1	11.6	92.3%	3.9	5.9	4.3	0.0	14.2	27.6%
Kenya	11.2	-	1.7	0.2	13.1	85.7%	10.2	27.0	6.1	-	43.3	23.6%
Libya	48.1	7.8	5.7	0.2	61.8	90.4%	26.6	1.6	1.9	0.1	30.1	88.3%
Mauritius	3.7	0.0	0.0	0.0	3.7	99.5%	0.2	0.0	0.2	-	0.5	47.4%
Morocco	46.4	-	5.1	0.4	51.9	89.5%	0.4	6.9	6.5	-	13.7	2.9%
Mozambique	2.4	-	1.2	0.1	3.7	64.5%	3.9	28.3	4.0	0.7	36.9	10.7%
Namibia	3.1	-	0.0	0.0	3.1	99.3%	0.1	5.3	0.4	-	5.8	1.2%
Niger	1.4	0.0	0.0	0.0	1.4	96.3%	1.8	14.6	2.3	-	18.6	9.7%
Nigeria	54.9	29.8	4.3	1.2	90.2	93.9%	112.0	38.5	25.8	0.2	176.5	63.4%
Senegal	5.5	-	1.5	0.1	7.0	77.6%	1.5	5.4	2.1	-	9.0	16.6%
South Africa	406.9	27.2	16.7	0.9	451.7	96.1%	37.8	26.2	15.4	0.2	79.7	47.5%
South Sudan	-	-	-	-	-	-	-	-	-	-	-	0.0%
Sudan	15.0	0.8	0.7	0.2	16.7	94.5%	8.9	72.2	7.4	0.7	89.2	10.0%
United Rep. of Tanzania	6.1	0.0	0.8	0.2	7.1	85.9%	8.3	37.6	7.4	0.9	54.1	15.3%
Togo	2.1	-	0.4	0.0	2.5	81.7%	1.8	1.9	1.0	0.0	4.6	38.4%
Tunisia	23.3	0.9	3.2	0.2	27.6	87.6%	4.3	2.5	2.2	-	9.0	48.0%
Zambia	1.6	-	0.5	0.0	2.2	74.7%	3.9	30.7	2.5	1.0	38.2	10.3%
Zimbabwe	9.3	0.2	0.6	0.1	10.1	93.9%	2.3	9.9	2.2	0.1	14.6	16.0%
Other Africa	25.0	2.4	2.0	0.7	30.4	90.2%	32.7	141.6	27.1	0.9	202.2	16.2%
Africa	995.4	105.0	86.9	9.0	1 196.5	92.0%	437.5	682.1	177.6	13.0	1 310.1	33.4%

1. Please refer to the chapter Geographical coverage.

2010 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

Energy	N ₂ O					Share of energy	HFCs	PFCs	SF ₆	Total			
	Industrial processes	Agriculture	Other	Total	Industrial processes		Total	Share of energy	GHG / GDP PPP ²				
148.7	46.0	1 602.9	279.6	2 077.2	7.2%	277.5	30.8	85.8	29 030.2	68.8%	0.64	Non-OECD Total	
0.0	-	0.6	0.1	0.8	5.1%	0.1	-	-	8.2	50.3%	0.29	Albania	
0.0	-	0.6	0.1	0.7	2.5%	0.5	-	-	7.7	58.4%	0.41	Armenia	
0.2	-	2.1	0.3	2.5	6.6%	0.1	0.1	-	45.3	73.6%	0.32	Azerbaijan	
0.4	0.3	10.1	0.5	11.4	3.9%	0.7	0.0	-	101.7	64.0%	0.67	Belarus	
0.1	-	0.7	0.2	1.0	11.2%	0.7	0.1	-	27.8	81.4%	0.80	Bosnia and Herzegovina	
0.3	0.2	1.9	0.4	2.7	10.0%	0.6	0.0	-	61.1	75.7%	0.55	Bulgaria	
0.2	0.9	1.4	0.2	2.7	6.1%	0.1	0.0	-	28.7	70.2%	0.34	Croatia	
0.0	-	0.2	0.1	0.3	11.3%	0.3	-	-	10.2	71.6%	0.37	Cyprus ¹	
0.0	-	0.3	0.1	0.5	10.1%	0.2	-	-	11.9	73.2%	0.51	FYR of Macedonia	
0.0	0.8	1.0	0.1	1.9	2.2%	0.0	-	-	11.1	49.2%	0.43	Georgia	
0.0	-	-	0.0	0.0	40.0%	-	-	-	0.5	95.6%	0.55	Gibraltar	
1.0	-	11.7	1.3	14.0	7.2%	0.6	-	-	309.0	85.3%	0.96	Kazakhstan	
-	-	-	-	-	0.0%	-	-	-	8.7	100.0%	0.63	Kosovo	
0.0	-	1.4	0.1	1.5	1.6%	0.0	-	-	13.5	46.1%	0.91	Kyrgyzstan	
0.1	2.0	2.0	0.2	4.3	2.7%	1.1	0.0	-	23.6	56.1%	0.38	Lithuania	
0.0	-	0.0	0.0	0.1	12.7%	0.2	-	-	3.1	84.7%	0.27	Malta	
0.0	-	0.5	0.1	0.6	6.2%	0.0	-	-	10.9	76.7%	0.80	Republic of Moldova	
-	-	-	-	-	0.0%	-	-	-	2.6	100.0%	0.31	Montenegro	
0.6	2.8	6.7	0.9	10.9	5.2%	0.7	0.2	0.0	115.8	70.4%	0.33	Romania	
5.7	18.2	30.6	22.3	76.9	7.4%	31.7	15.1	9.1	2 233.2	82.1%	0.76	Russian Federation	
0.4	0.2	2.4	0.4	3.4	12.2%	7.0	0.1	-	69.0	70.0%	0.78	Serbia	
0.0	-	1.4	0.1	1.5	0.5%	0.0	0.2	-	10.3	24.3%	0.66	Tajikistan	
0.1	0.9	4.0	0.2	5.1	1.9%	0.1	-	-	98.2	83.7%	1.98	Turkmenistan	
1.2	5.2	11.5	2.1	20.0	6.2%	0.4	0.2	0.4	393.0	80.7%	1.12	Ukraine	
0.3	0.1	9.5	0.6	10.5	3.1%	1.0	-	-	169.9	74.6%	1.43	Uzbekistan	
10.9	31.5	100.7	30.3	173.5	6.3%	46.1	16.0	9.5	3 774.8	79.9%	0.76	Non-OECD Europe and Eurasia	
0.3	1.2	3.3	1.1	5.9	4.7%	0.3	-	0.4	194.9	84.7%	0.43	Algeria	
0.4	-	33.3	1.9	35.5	1.1%	0.0	-	-	144.2	34.8%	1.07	Angola	
0.1	-	2.2	0.2	2.5	4.5%	-	-	-	13.6	42.3%	0.83	Benin	
0.1	-	3.9	0.1	4.0	1.4%	-	-	-	15.3	25.3%	0.58	Botswana	
0.3	-	6.4	0.6	7.3	3.6%	-	0.2	-	45.4	49.8%	0.79	Cameroon	
0.0	-	1.7	0.2	1.9	2.6%	0.0	-	-	19.3	73.4%	0.87	Congo	
0.3	-	3.2	0.4	3.9	6.6%	-	-	-	23.7	48.0%	0.44	Côte d'Ivoire	
1.1	-	39.7	4.4	45.1	2.3%	-	-	-	136.3	9.0%	3.54	Dem. Rep. of the Congo	
1.7	5.4	15.3	2.4	24.9	6.7%	0.5	0.8	1.3	296.0	70.6%	0.36	Egypt	
0.0	-	1.2	0.0	1.2	1.8%	-	-	-	5.4	17.3%	0.89	Eritrea	
1.7	-	29.9	2.0	33.5	4.9%	0.0	-	-	130.9	21.5%	1.42	Ethiopia	
0.1	-	0.2	0.1	0.4	20.3%	0.0	-	-	15.2	92.4%	0.61	Gabon	
0.3	-	3.5	0.5	4.3	7.0%	0.0	-	-	30.1	49.6%	0.41	Ghana	
0.6	-	12.6	0.8	14.1	4.1%	-	0.0	-	70.5	31.3%	0.70	Kenya	
0.2	-	0.8	0.6	1.6	13.9%	-	-	0.3	93.8	88.1%	0.52	Libya	
0.0	-	0.1	0.1	0.2	15.6%	0.0	-	-	4.3	90.0%	0.22	Mauritius	
0.4	-	4.8	0.9	6.0	6.6%	-	-	-	71.6	65.9%	0.34	Morocco	
0.3	-	18.6	1.0	19.8	1.6%	0.1	0.1	-	60.6	10.9%	2.78	Mozambique	
0.1	-	2.8	0.1	3.0	3.9%	-	-	-	11.8	27.6%	0.66	Namibia	
0.2	-	6.5	0.4	7.0	2.7%	-	-	-	27.1	12.4%	2.07	Niger	
5.0	-	20.2	4.7	29.9	16.7%	0.6	0.0	0.4	297.6	67.8%	0.37	Nigeria	
0.1	-	2.5	0.2	2.8	2.3%	-	-	-	18.9	37.2%	0.68	Senegal	
2.7	0.0	15.2	3.3	21.2	12.8%	0.8	0.3	1.7	555.3	85.5%	0.92	South Africa	
-	-	-	-	-	0.0%	-	-	-	..	..	..	South Sudan
0.4	-	36.4	1.4	38.3	1.1%	-	-	-	144.1	17.4%	0.98	Sudan	
0.8	-	20.4	1.7	23.0	3.5%	-	-	-	84.2	18.1%	0.92	United Rep. of Tanzania	
0.1	-	1.2	0.1	1.4	5.7%	-	-	-	8.5	46.1%	1.11	Togo	
0.2	0.3	1.6	0.3	2.4	8.9%	-	-	-	39.0	73.6%	0.36	Tunisia	
0.3	0.3	22.9	1.0	24.5	1.1%	0.0	-	-	64.9	9.0%	1.46	Zambia	
0.4	-	5.2	0.5	6.0	6.0%	-	-	-	30.7	39.7%	1.51	Zimbabwe	
2.8	-	68.1	4.2	75.0	3.8%	0.1	-	-	307.8	20.5%	0.99	Other Africa	
20.8	7.3	383.5	34.9	446.5	4.7%	2.5	1.4	4.2	2 961.1	52.6%	0.65	Africa	

1. Please refer to the chapter Geographical coverage.

2. GHG / GDP PPP ratio is expressed in kg of CO₂-equivalent per 2010 USD.

2010 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

	CO ₂						CH ₄					
	Fuel comb.	Fugitive	Industrial processes	Other	Total	Share of energy	Energy	Agricult.	Waste	Other	Total	Share of energy
Bangladesh	49.9	0.0	7.5	1.4	58.8	84.9%	9.7	87.7	20.7	0.0	118.3	8.2%
Brunei Darussalam	6.9	0.4	0.1	0.0	7.4	98.2%	5.1	0.0	0.1	0.0	5.2	97.5%
Cambodia	4.6	-	0.4	0.0	5.0	92.2%	2.5	19.7	2.1	0.2	24.5	10.2%
DPR of Korea	49.3	-	3.3	0.3	52.9	93.2%	12.5	5.0	6.3	0.0	23.8	52.6%
India	1 580.6	7.4	129.6	28.4	1 759.8	90.2%	128.1	473.3	170.3	3.5	775.1	16.5%
Indonesia	362.0	4.7	31.7	6.0	404.4	90.7%	110.6	111.9	56.8	0.4	279.8	39.5%
Malaysia	189.9	4.1	17.5	6.4	217.8	89.1%	30.1	6.4	7.1	0.7	44.3	68.0%
Mongolia	14.1	0.1	0.2	0.0	14.4	98.6%	7.8	7.6	0.5	0.1	16.1	48.5%
Myanmar	7.9	0.1	0.3	0.2	8.5	93.7%	8.0	77.3	8.4	4.6	98.3	8.1%
Nepal	4.1	-	0.6	0.1	4.8	85.6%	2.7	22.9	3.1	0.3	29.0	9.3%
Pakistan	129.6	0.2	18.5	2.7	151.0	86.0%	22.7	120.8	24.0	0.0	167.5	13.6%
Philippines	77.1	0.7	7.0	1.7	86.5	90.0%	9.0	41.7	17.1	0.1	67.9	13.2%
Singapore	44.3	-	6.4	0.2	50.9	87.0%	0.5	0.0	2.1	0.0	2.6	19.2%
Sri Lanka	12.4	-	0.8	0.5	13.7	90.6%	1.3	9.1	2.6	0.0	13.0	10.2%
Chinese Taipei	256.4	0.7	15.7	1.5	274.2	93.7%	1.1	2.6	6.3	0.0	10.0	10.8%
Thailand	223.4	0.4	20.3	1.6	245.8	91.1%	26.5	79.9	14.9	0.8	122.1	21.7%
Viet Nam	126.1	1.0	26.6	1.8	155.6	81.8%	26.7	69.4	14.5	0.7	111.3	24.0%
Other non-OECD Asia	22.1	0.1	1.3	0.2	23.8	93.6%	4.0	26.8	6.2	4.6	41.5	9.6%
Asia (excl. China)	3 160.9	19.8	287.7	53.1	3 535.2	90.0%	408.9	1 162.2	362.9	16.2	1 950.2	21.0%
People's Rep. of China	7 791.6	106.8	1 111.3	63.4	9 021.7	87.5%	668.3	588.5	261.0	7.6	1 525.4	43.8%
Hong Kong, China	42.0	-	0.7	0.2	42.9	97.9%	0.1	0.0	1.9	-	2.1	5.7%
China	7 833.6	106.8	1 112.0	63.6	9 064.6	87.6%	668.4	588.5	263.0	7.6	1 527.5	43.8%
Argentina	173.8	1.2	9.5	7.0	191.4	91.4%	22.3	84.4	10.1	1.5	118.3	18.8%
Bolivia	13.7	0.2	0.9	0.0	14.8	93.5%	6.2	29.2	2.0	20.0	57.4	10.9%
Brazil	370.6	2.5	47.5	20.9	441.5	84.5%	38.5	396.2	86.3	53.2	574.1	6.7%
Colombia	60.2	1.9	3.8	0.6	66.5	93.4%	15.3	48.7	10.2	0.0	74.3	20.7%
Costa Rica	6.6	-	0.5	0.1	7.2	91.3%	0.1	2.7	0.8	-	3.7	3.7%
Cuba	29.5	0.1	0.8	0.1	30.5	97.0%	1.0	7.5	4.7	0.0	13.2	7.6%
Curaçao ¹	4.4	-	0.1	0.0	4.4	98.7%	0.0	0.0	0.0	-	0.0	71.4%
Dominican Republic	19.0	-	1.5	0.2	21.4	88.8%	0.3	6.2	3.7	0.0	10.3	3.4%
Ecuador	32.1	3.5	1.9	0.3	37.8	94.1%	8.9	12.5	2.8	-	24.3	36.7%
El Salvador	5.8	-	0.5	0.4	6.7	86.8%	0.2	2.0	1.0	-	3.1	5.9%
Guatemala	10.3	0.0	1.1	0.3	11.6	88.5%	1.9	5.7	2.4	0.1	10.1	18.6%
Haiti	2.1	-	0.2	0.0	2.4	88.8%	3.2	2.7	2.9	-	8.8	36.1%
Honduras	7.5	-	0.6	0.1	8.1	93.0%	0.5	5.3	1.2	0.0	7.0	7.5%
Jamaica	6.9	-	0.5	0.0	7.5	92.8%	0.5	0.4	0.8	0.0	1.7	29.5%
Nicaragua	4.3	-	0.3	0.1	4.6	92.4%	0.4	5.5	1.1	-	7.0	5.0%
Panama	8.8	-	0.6	0.0	9.4	93.7%	0.1	3.1	0.7	-	3.9	3.7%
Paraguay	4.7	-	0.3	0.2	5.2	89.9%	1.4	19.5	1.3	0.7	22.9	6.3%
Peru	41.1	0.2	3.4	0.4	45.1	91.5%	5.0	14.3	5.5	0.1	25.0	20.2%
Suriname	1.7	0.0	0.0	0.0	1.7	98.7%	0.0	0.5	0.1	-	0.7	5.5%
Trinidad and Tobago	22.4	0.1	18.5	0.0	41.1	54.8%	14.1	0.1	2.1	0.3	16.7	84.7%
Uruguay	6.0	-	0.3	0.1	6.4	93.7%	0.2	21.3	2.7	-	24.2	0.8%
Venezuela	171.5	6.7	9.8	1.0	189.1	94.3%	34.7	27.5	8.1	1.8	72.0	48.2%
Other non-OECD Americas	17.0	0.0	0.3	0.2	17.5	97.3%	0.2	2.6	3.0	0.0	5.8	4.2%
Non-OECD Americas	1 019.9	16.4	102.9	32.2	1 171.9	88.4%	155.4	697.8	153.5	77.8	1 084.4	14.3%
Bahrain	25.6	0.0	2.9	0.0	28.5	89.9%	4.5	0.0	0.7	0.0	5.2	86.5%
Islamic Republic of Iran	498.6	23.5	45.0	1.6	568.8	91.8%	114.5	21.2	26.6	0.3	162.6	70.4%
Iraq	103.9	18.1	3.9	0.5	126.1	96.8%	45.7	4.6	9.0	-	59.4	77.0%
Jordan	18.8	-	1.8	0.1	20.6	91.2%	0.2	0.5	2.5	-	3.2	5.6%
Kuwait	77.0	4.5	4.8	0.1	86.4	94.3%	19.2	0.2	1.7	0.0	21.1	91.1%
Lebanon	18.2	-	2.3	0.0	20.6	88.5%	0.1	0.3	1.6	-	2.0	5.0%
Oman	42.4	3.3	6.9	0.1	52.6	86.9%	19.2	0.7	1.5	0.1	21.5	88.9%
Qatar	55.5	3.8	8.6	0.0	69.6	85.3%	51.3	0.1	1.6	0.1	53.0	96.7%
Saudi Arabia	419.2	8.0	50.2	0.9	478.3	89.3%	63.0	2.8	13.5	0.4	79.8	79.1%
Syrian Arab Republic	56.6	1.9	3.0	0.6	62.1	94.2%	8.2	3.7	5.1	-	17.0	48.3%
United Arab Emirates	154.6	2.1	15.0	0.3	171.8	91.2%	27.0	1.0	3.5	0.0	31.5	85.8%
Yemen	22.4	3.8	0.9	0.1	27.2	96.3%	10.9	5.0	4.2	-	20.1	54.1%
Middle East	1 492.7	69.0	145.2	4.4	1 712.4	91.2%	363.7	40.3	71.4	1.0	476.4	76.4%

1. Please refer to the chapter Geographical coverage.

2010 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

Energy	N ₂ O					Share of energy	HFCs	PFCs	SF ₆	Total			
	Industrial processes	Agriculture	Other	Total	Industrial processes		Total	Share of energy	GHG / GDP PPP ²				
0.8	-	19.3	2.3	22.4	3.7%	-	-	-	199.4	30.3%	0.55	Bangladesh	
0.0	-	0.1	0.0	0.1	9.9%	0.4	-	-	13.1	93.8%	0.43	Brunei Darussalam	
0.2	-	2.8	0.4	3.4	6.0%	-	-	-	33.0	22.2%	0.93	Cambodia	
0.4	-	1.7	0.6	2.7	13.3%	4.4	-	-	83.8	74.2%	0.83	DPR of Korea	
20.5	0.3	185.6	29.4	235.9	8.7%	17.3	1.0	5.3	2 794.4	62.6%	0.53	India	
5.2	0.2	63.0	6.8	75.2	6.9%	-	0.1	1.0	760.5	63.4%	0.38	Indonesia	
1.3	0.8	9.0	1.6	12.7	10.1%	0.1	0.2	0.7	275.8	81.7%	0.47	Malaysia	
0.1	-	3.6	0.2	3.9	3.0%	-	-	-	34.4	64.3%	1.68	Mongolia	
0.6	-	16.1	4.0	20.8	3.0%	-	-	-	127.5	13.0%	0.70	Myanmar	
0.5	-	3.4	0.8	4.7	10.4%	-	-	-	38.5	19.0%	0.73	Nepal	
2.0	0.0	38.9	3.9	44.8	4.5%	-	-	1.0	364.2	42.4%	0.51	Pakistan	
0.6	0.0	9.4	1.9	11.8	5.0%	-	-	0.4	166.7	52.4%	0.32	Philippines	
0.1	0.7	0.0	0.9	1.7	5.9%	2.2	0.6	0.4	58.4	76.8%	0.16	Singapore	
0.3	-	1.8	0.5	2.6	11.9%	-	-	-	29.3	47.9%	0.17	Sri Lanka	
1.3	0.7	2.1	1.2	5.2	24.3%	0.1	2.4	4.5	296.5	87.5%	0.34	Chinese Taipei	
4.4	0.5	16.1	2.6	23.7	18.8%	-	-	1.3	392.8	64.9%	0.44	Thailand	
1.3	-	17.4	3.0	21.8	6.0%	-	-	-	288.6	53.8%	0.76	Viet Nam	
0.3	-	9.1	4.0	13.4	2.3%	0.1	-	-	78.8	33.7%	0.45	Other non-OECD Asia	
40.0	3.2	399.3	64.2	506.8	7.9%	24.6	4.2	14.6	6 035.6	60.4%	0.47	Asia (excl. China)	
58.0	1.1	364.6	61.9	485.6	11.9%	195.2	5.7	48.6	11 282.3	76.0%	0.90	People's Rep. of China	
0.2	-	0.0	0.3	0.4	37.4%	-	-	0.1	45.6	92.8%	0.14	Hong Kong, China	
58.2	1.1	364.6	62.1	486.0	12.0%	195.2	5.7	48.8	11 327.8	76.1%	0.88	China	
1.7	0.1	47.5	2.7	52.1	3.2%	0.4	0.1	0.4	362.7	54.8%	0.48	Argentina	
0.3	-	15.4	13.2	28.9	1.0%	-	-	-	101.1	20.2%	1.92	Bolivia	
7.3	1.0	177.1	42.4	227.9	3.2%	3.2	2.9	1.4	1 251.0	33.5%	0.45	Brazil	
0.7	0.1	18.3	1.1	20.1	3.4%	-	-	0.1	161.0	48.6%	0.33	Colombia	
0.1	0.0	1.3	0.1	1.5	6.4%	0.1	-	-	12.6	54.5%	0.22	Costa Rica	
0.2	0.5	4.8	0.4	5.8	2.7%	0.2	-	-	49.8	61.8%	0.25	Cuba	
0.0	-	0.0	0.0	0.1	30.2%	-	-	-	4.5	97.6%	1.89	Curaçao ¹	
0.1	-	2.2	0.3	2.6	4.7%	-	-	-	34.3	58.7%	0.32	Dominican Republic	
0.2	-	4.1	0.6	4.9	4.2%	0.1	-	-	67.1	66.6%	0.49	Ecuador	
0.1	-	1.2	0.2	1.5	4.5%	0.1	-	-	11.4	53.3%	0.26	El Salvador	
0.4	-	2.8	0.5	3.7	10.4%	0.8	-	-	26.1	47.9%	0.27	Guatemala	
0.1	-	1.2	0.2	1.5	8.0%	-	-	-	12.6	42.7%	0.86	Haiti	
0.1	-	2.5	0.3	2.9	4.3%	-	-	-	18.0	44.7%	0.56	Honduras	
0.1	-	0.3	0.1	0.5	11.8%	0.1	-	-	9.7	77.3%	0.44	Jamaica	
0.1	-	3.1	0.2	3.4	2.3%	-	-	-	15.0	31.4%	0.66	Nicaragua	
0.1	-	1.0	0.1	1.2	5.2%	-	-	-	14.6	62.2%	0.26	Panama	
0.1	-	8.6	0.6	9.3	1.5%	-	-	-	37.5	16.6%	0.84	Paraguay	
0.3	-	6.5	0.9	7.6	3.6%	0.5	-	-	78.2	59.6%	0.27	Peru	
0.0	-	0.1	0.1	0.3	12.6%	-	-	-	2.7	65.9%	0.37	Suriname	
0.1	-	6.9	0.1	7.1	0.9%	0.1	-	-	64.9	56.5%	1.60	Trinidad and Tobago	
0.7	0.0	11.1	2.6	14.4	4.8%	1.6	0.2	0.3	47.0	14.6%	0.83	Uruguay	
0.2	-	2.3	0.3	2.8	6.4%	0.0	-	0.0	263.9	80.8%	0.56	Venezuela	
0.2	-	2.3	0.3	2.8	6.4%	0.0	-	0.0	26.2	66.6%	0.65	Other non-OECD Americas	
13.0	1.7	320.7	67.4	402.8	3.2%	7.3	3.1	2.2	2 671.8	45.1%	0.46	Non-OECD Americas	
0.0	-	0.0	0.1	0.2	17.2%	-	0.1	-	33.9	88.7%	0.69	Bahrain	
2.8	0.8	19.6	7.6	30.8	9.0%	-	0.1	2.7	765.0	83.6%	0.58	Islamic Republic of Iran	
0.4	-	3.4	2.6	6.5	6.5%	-	-	0.1	192.0	87.4%	0.50	Iraq	
0.0	-	0.4	0.5	1.0	5.1%	0.2	-	-	25.0	76.3%	0.37	Jordan	
0.2	-	0.1	0.5	0.8	23.4%	0.9	-	0.5	109.6	92.0%	0.50	Kuwait	
0.1	-	0.3	0.4	0.8	8.7%	-	-	-	23.4	78.6%	0.33	Lebanon	
0.1	-	0.5	0.4	1.0	10.8%	0.3	0.0	-	75.4	86.1%	0.56	Oman	
0.1	-	0.1	0.3	0.5	19.2%	-	-	-	123.1	91.2%	0.56	Qatar	
1.0	-	2.5	4.0	7.4	13.6%	0.3	-	2.3	568.1	86.5%	0.47	Saudi Arabia	
0.3	0.3	4.0	1.4	5.9	5.0%	-	-	-	85.1	78.8%	0.64	Syrian Arab Republic	
0.2	-	0.6	1.2	2.1	11.4%	-	0.1	1.0	206.5	89.0%	0.44	United Arab Emirates	
0.5	-	2.7	1.5	4.6	10.2%	-	-	-	52.0	72.3%	0.50	Yemen	
5.8	1.1	34.2	20.6	61.7	9.3%	1.7	0.3	6.6	2 259.1	85.5%	0.52	Middle East	

1. Please refer to the chapter Geographical coverage.

2. GHG / GDP PPP ratio is expressed in kg of CO₂-equivalent per 2010 USD.

2015 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

	CO ₂						CH ₄					
	Fuel comb.	Fugitive	Industrial processes	Other	Total	Share of energy	Energy	Agricult.	Waste	Other	Total	Share of energy
World ¹	32 276.0	561.5	2 660.5	207.4	35 665.9	92.1%	3 277.3	4 149.8	1 754.8	173.1	9 355.0	35.0%
<i>Annex I Parties</i>	12 332.1	151.9	562.2	64.6	13 117.1	95.2%	880.1	784.9	542.8	77.3	2 285.2	38.5%
<i>Annex II Parties</i>	9 670.4	60.0	348.4	51.5	10 136.6	96.0%	503.8	622.1	332.8	45.3	1 504.1	33.5%
<i>North America</i>	5 461.4	38.6	122.7	26.1	5 655.1	97.3%	373.3	248.5	170.1	41.7	833.5	44.8%
<i>Europe</i>	2 646.0	17.1	136.2	17.2	2 816.5	94.6%	94.4	215.4	137.9	0.6	448.3	21.0%
<i>Asia Oceania</i>	1 563.1	4.2	89.4	8.2	1 664.9	94.1%	36.2	158.2	24.9	3.0	222.4	16.3%
<i>Annex I EIT</i>	2 335.2	90.8	171.1	8.2	2 605.2	93.1%	364.2	127.0	152.9	32.0	676.1	53.9%
<i>Non-Annex I Parties</i>	18 750.0	409.6	2 098.4	142.8	21 361.7	89.7%	2 384.6	3 364.9	1 212.0	95.8	7 057.2	33.8%
<i>Annex B Kyoto Parties</i>	4 126.7	53.0	231.5	27.1	4 438.0	94.2%	279.8	398.9	218.9	3.7	901.2	31.1%
Intl. aviation bunkers	531.8	-	-	-	529.4	100.4%	0.1	-	-	-	0.1	100.0%
Intl. marine bunkers	662.2	-	-	-	657.7	100.7%	12.4	-	-	-	12.4	100.0%
Non-OECD Total	19 433.4	473.6	2 158.3	143.6	22 169.9	89.8%	2 655.9	3 368.8	1 278.5	127.2	7 430.4	35.7%
OECD Total	11 648.7	87.9	502.2	63.8	12 308.9	95.4%	608.8	781.0	476.3	45.9	1 912.0	31.8%
Canada	541.8	4.2	21.1	2.0	569.1	95.9%	83.6	26.3	27.0	36.8	173.7	48.1%
Chile	81.2	0.1	5.3	0.2	86.7	93.7%	3.3	7.7	11.9	0.2	23.1	14.2%
Mexico	442.4	11.7	29.2	4.5	487.7	93.1%	38.5	67.1	28.1	0.2	133.9	28.7%
United States	4 919.6	34.4	101.7	24.1	5 086.1	97.4%	289.7	222.2	143.1	4.9	659.8	43.9%
OECD Americas	5 985.0	50.4	157.2	30.7	6 229.6	96.9%	415.0	323.3	210.1	42.1	990.5	41.9%
Australia	379.3	4.0	14.6	4.1	401.9	95.3%	30.4	97.1	12.4	2.7	142.6	21.3%
Israel ²	64.4	0.0	3.7	0.3	68.4	94.1%	2.8	1.5	4.9	0.0	9.2	30.7%
Japan	1 152.6	0.0	72.9	2.8	1 228.3	93.8%	4.5	31.9	8.5	0.1	45.0	9.9%
Korea	582.0	8.6	43.1	0.9	634.7	93.1%	4.5	16.2	15.0	0.1	35.8	12.6%
New Zealand	31.2	0.3	1.9	1.2	34.7	90.8%	1.3	29.3	4.0	0.1	34.7	3.8%
OECD Asia Oceania	2 209.5	12.9	136.2	9.4	2 368.0	93.8%	43.5	176.0	44.8	3.1	267.4	16.3%
Austria	62.5	0.3	4.2	0.4	67.5	93.1%	2.4	4.8	2.5	0.0	9.8	24.5%
Belgium	92.7	0.5	6.3	0.4	99.9	93.3%	6.7	6.6	3.6	0.0	17.0	39.6%
Czech Republic	99.7	1.6	5.4	0.2	106.9	94.7%	3.3	4.4	4.8	0.0	12.6	26.3%
Denmark	32.0	0.2	1.1	0.3	33.5	95.9%	1.2	6.3	1.4	-	8.9	13.9%
Estonia	15.1	0.9	0.3	0.1	16.5	97.2%	0.4	0.8	1.8	0.0	2.9	14.0%
Finland	42.4	0.3	1.8	0.3	44.8	95.4%	6.1	2.3	7.2	0.0	15.6	38.9%
France	292.2	2.2	20.1	3.2	317.6	92.7%	6.5	42.7	16.5	0.1	65.8	9.9%
Germany	729.7	5.7	30.7	4.9	770.9	95.4%	13.7	35.6	18.0	0.2	67.5	20.4%
Greece	64.5	-	4.7	0.3	69.5	92.9%	14.7	4.0	4.1	0.0	22.8	64.3%
Hungary	42.7	0.6	3.6	0.2	47.2	91.9%	2.2	3.0	4.0	0.0	9.2	23.8%
Iceland	2.1	-	1.7	0.0	3.8	54.4%	0.0	0.3	0.2	0.0	0.5	0.8%
Ireland	35.4	0.5	1.8	0.3	37.9	94.5%	2.1	14.6	1.4	-	18.1	11.8%
Italy	329.7	0.4	15.3	2.6	348.0	94.9%	6.5	19.1	15.2	0.0	40.9	16.0%
Latvia	6.8	-	0.7	0.1	7.6	90.0%	0.5	1.1	0.7	0.0	2.3	22.6%
Luxembourg	8.8	-	0.5	0.0	9.3	94.5%	0.1	0.4	0.1	-	0.6	9.7%
Netherlands	156.1	0.7	4.6	0.4	161.9	96.9%	5.2	12.8	4.8	0.1	22.9	22.9%
Norway	36.1	0.6	6.7	0.1	43.5	84.4%	15.4	2.5	2.0	0.1	20.0	77.1%
Poland	282.7	3.0	15.2	0.7	301.6	94.7%	34.8	18.7	12.8	0.0	66.2	52.6%
Portugal	47.0	-	3.9	0.2	51.1	92.0%	0.9	4.2	8.1	0.0	13.2	7.0%
Slovak Republic	29.4	0.2	4.4	0.2	34.2	86.7%	1.1	1.6	3.2	0.0	5.9	18.3%
Slovenia	12.8	-	0.8	0.0	13.6	94.0%	1.5	1.3	0.7	0.0	3.5	42.9%
Spain	247.1	0.9	15.7	1.8	265.5	93.4%	2.8	23.6	16.5	0.1	42.9	6.6%
Sweden	37.1	0.5	4.3	0.2	42.2	89.2%	1.1	3.4	7.3	0.1	11.9	9.4%
Switzerland	37.3	-	2.2	0.4	39.9	93.5%	0.7	3.6	5.1	0.0	9.4	7.8%
Turkey	319.0	1.2	42.2	4.9	367.2	87.2%	12.1	35.4	55.6	0.0	103.2	11.7%
United Kingdom	393.5	4.3	10.7	1.3	409.8	97.1%	7.9	28.7	23.8	0.1	60.5	13.1%
OECD Europe	3 454.2	24.6	208.8	23.7	3 711.3	93.7%	150.3	281.7	221.4	0.7	654.1	23.0%
<i>IEA/Accession/Association</i>	24 352.9	261.7	2 113.1	177.3	26 905.0	91.5%	1 707.6	2 486.7	1 146.9	113.7	5 454.9	31.3%
<i>European Union - 28</i>	3 206.6	23.3	171.6	18.9	3 420.4	94.4%	131.2	254.4	173.7	0.6	559.9	23.4%
<i>G20</i>	26 220.5	356.0	2 242.9	174.7	28 961.6	91.8%	2 038.5	2 497.4	1 222.4	145.2	5 903.5	34.5%
<i>Africa</i>	1 141.0	89.0	93.2	6.4	1 333.9	92.2%	433.4	702.0	202.4	11.9	1 349.8	32.1%
<i>Americas</i>	7 126.8	82.4	249.0	41.2	7 499.4	96.1%	589.9	996.1	371.0	63.0	2 020.1	29.2%
<i>Asia</i>	17 250.6	275.9	1 987.7	128.8	19 643.0	89.2%	1 742.4	1 948.1	858.5	60.5	4 609.4	37.8%
<i>Europe</i>	5 076.6	109.6	312.3	25.6	5 524.1	93.9%	463.1	351.0	299.4	32.6	1 146.2	40.4%
<i>Oceania</i>	410.5	4.2	16.5	5.4	436.6	95.0%	31.7	126.3	16.4	2.9	177.3	17.9%

1. Total World includes Non-OECD total, OECD total as well as international bunkers. 2. Please refer to the chapter Geographical coverage.

Sources: IEA, CO₂ emissions from fuel combustion, EDGAR 4.3.2 FT2016, EDGAR 5.0 and 4.2 FT2010 databases for other emissions.

2015 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

Energy	N ₂ O					Share of energy	HFCs	PFCs	SF ₆	Total			
	Industrial processes	Agriculture	Other	Total	Industrial processes		Total	Share of energy	GHG / GDP PPP ³				
292.6	202.7	2 160.8	433.2	3 089.3	9.5%	745.4	43.8	165.5	49 064.8	74.1%	0.46	World ¹	
117.8	117.0	555.1	141.4	931.3	12.7%	482.7	32.1	74.8	16 923.2	79.7%	0.35	Annex I Parties	
99.6	47.6	433.5	96.0	676.7	14.7%	431.4	20.8	62.9	12 832.5	80.6%	0.32	Annex II Parties	
66.9	19.1	198.0	62.8	346.8	19.3%	275.3	8.9	45.3	7 164.9	83.0%	0.39	North America	
21.5	24.9	156.2	22.4	225.0	9.6%	102.7	5.8	13.0	3 611.3	77.0%	0.22	Europe	
11.1	3.6	79.3	10.9	104.9	10.6%	53.3	6.1	4.6	2 056.2	78.5%	0.35	Asia Oceania	
14.9	54.3	97.5	38.8	205.6	7.2%	46.2	11.0	9.9	3 554.1	78.9%	0.58	Annex I EIT	
165.8	85.7	1 605.7	268.3	2 125.5	7.8%	262.7	11.7	90.7	30 909.5	70.1%	0.54	Non-Annex I Parties	
35.0	62.4	293.2	36.9	427.6	8.2%	126.0	7.0	14.4	5 914.1	76.0%	0.29	Annex B Kyoto Parties	
4.2	-	-	3.2	7.4	57.3%	-	-	-	536.9	99.4%	..	Intl. aviation bunkers	
4.7	-	-	20.4	25.1	18.7%	-	-	-	695.2	97.1%	..	Intl. marine bunkers	
166.9	62.3	1 626.8	292.7	2 148.8	7.8%	283.8	20.7	92.5	32 146.2	70.6%	0.56	Non-OECD Total	
116.7	140.4	534.0	117.0	908.0	12.9%	461.6	23.0	72.9	15 686.6	79.5%	0.33	OECD Total	
6.5	0.8	27.7	27.3	62.3	10.4%	17.4	2.5	4.1	829.0	76.7%	0.55	Canada	
0.5	0.7	6.0	0.9	8.1	6.5%	-	-	0.0	118.0	72.1%	0.31	Chile	
3.6	67.7	34.2	5.4	110.9	3.2%	11.2	0.1	0.5	744.3	66.7%	0.37	Mexico	
60.5	18.3	170.3	35.5	284.5	21.2%	257.9	6.5	41.2	6 336.0	83.8%	0.38	United States	
71.0	87.4	238.2	69.1	465.8	15.3%	286.5	9.0	45.8	8 027.3	81.3%	0.39	OECD Americas	
3.7	1.8	59.9	4.3	69.7	5.4%	9.6	0.4	0.6	624.7	66.8%	0.58	Australia	
0.2	0.0	1.0	1.2	2.3	9.3%	2.0	0.1	0.7	82.7	81.5%	0.32	Israel ²	
7.0	1.8	7.1	6.4	22.3	31.4%	42.6	5.7	3.9	1 347.9	86.4%	0.29	Japan	
3.6	1.1	4.8	2.9	12.5	29.1%	3.3	1.4	6.6	694.2	86.3%	0.40	Korea	
0.3	-	12.3	0.3	12.9	2.6%	1.1	0.1	0.1	83.6	39.7%	0.53	New Zealand	
14.9	4.7	85.1	15.0	119.7	12.5%	58.6	7.6	11.8	2 833.1	80.5%	0.36	OECD Asia Oceania	
0.7	0.3	2.2	0.6	3.8	17.6%	2.9	0.2	0.2	84.3	78.1%	0.23	Austria	
0.6	4.4	2.8	0.7	8.5	7.2%	2.9	0.0	0.1	128.5	78.2%	0.28	Belgium	
1.4	0.8	2.9	0.8	5.9	23.2%	1.7	0.0	0.0	127.1	83.3%	0.40	Czech Republic	
0.5	0.3	4.4	0.5	5.6	8.7%	1.9	0.0	0.0	50.0	67.8%	0.20	Denmark	
0.2	-	0.5	0.1	0.8	20.0%	0.1	0.0	0.0	20.3	81.8%	0.59	Estonia	
1.9	1.4	2.9	0.5	6.7	28.0%	1.2	0.0	0.1	68.3	74.1%	0.33	Finland	
3.1	2.3	39.0	3.0	47.3	6.5%	20.3	0.5	1.8	453.3	67.1%	0.18	France	
4.7	3.4	30.9	4.2	43.2	10.9%	21.9	0.9	7.0	911.4	82.7%	0.26	Germany	
0.5	0.3	4.1	0.7	5.5	8.6%	1.2	0.1	0.1	99.2	80.3%	0.39	Greece	
0.3	1.4	3.5	0.6	5.8	5.2%	1.9	0.0	0.0	64.2	71.4%	0.27	Hungary	
0.0	0.0	0.4	0.0	0.4	3.8%	0.1	0.0	0.0	4.8	43.6%	0.34	Iceland	
0.2	-	6.2	0.2	6.6	3.3%	1.4	0.1	0.1	64.1	59.5%	0.23	Ireland	
2.6	0.3	11.0	3.1	16.9	15.3%	14.0	0.4	1.1	421.3	80.5%	0.21	Italy	
0.1	-	1.1	0.1	1.3	10.5%	1.4	0.0	-	12.7	59.1%	0.29	Latvia	
0.1	-	0.1	0.1	0.3	28.6%	0.2	0.0	-	10.3	86.9%	0.21	Luxembourg	
0.7	4.4	5.8	0.9	11.9	6.0%	4.7	0.2	0.2	201.8	80.7%	0.26	Netherlands	
0.3	1.0	1.9	0.4	3.6	8.2%	0.5	1.6	0.2	69.3	75.6%	0.22	Norway	
3.5	4.9	20.5	2.0	30.9	11.4%	2.8	0.3	0.3	402.1	80.6%	0.43	Poland	
0.4	0.3	2.4	0.5	3.7	11.7%	1.0	0.0	0.1	69.2	69.9%	0.25	Portugal	
0.3	1.3	1.4	0.3	3.3	8.1%	0.5	0.0	-	44.0	70.5%	0.29	Slovak Republic	
0.1	-	0.5	0.2	0.8	13.7%	0.6	0.0	0.0	18.6	77.7%	0.32	Slovenia	
2.0	1.2	18.4	2.5	24.1	8.1%	10.3	1.0	1.0	344.7	73.3%	0.23	Spain	
1.0	3.9	3.5	0.7	9.0	10.6%	1.8	0.3	0.1	65.3	60.8%	0.15	Sweden	
0.3	0.1	1.4	0.5	2.2	13.7%	2.5	0.1	0.5	54.6	70.2%	0.12	Switzerland	
3.3	15.1	23.9	6.4	48.7	6.8%	4.7	0.2	2.0	525.9	63.8%	0.30	Turkey	
2.1	1.3	19.0	3.4	25.8	8.2%	13.8	0.4	0.5	510.9	79.8%	0.20	United Kingdom	
30.7	48.3	210.6	32.9	322.5	9.5%	116.5	6.4	15.3	4 826.2	75.8%	0.25	OECD Europe	
231.1	211.8	1 387.5	280.2	2 110.6	10.9%	691.0	29.7	136.4	35 327.6	75.2%	0.43	IEA/Accession/Association	
27.9	38.2	196.1	27.5	289.7	9.6%	111.7	4.7	12.6	4 399.0	77.0%	0.25	European Union - 28	
233.8	166.0	1 426.9	310.8	2 137.5	10.9%	713.4	38.2	147.4	37 901.6	76.0%	0.45	G20	
21.8	7.3	392.7	35.4	457.2	4.8%	2.5	0.9	4.4	3 148.7	53.7%	0.59	Africa	
85.2	89.1	544.5	101.3	820.1	10.4%	293.9	11.1	48.1	10 692.5	73.7%	0.40	Americas	
135.1	25.2	884.4	203.9	1 248.6	10.8%	281.0	14.4	89.5	25 885.9	75.0%	0.52	Asia	
37.1	79.4	258.2	62.1	436.8	8.5%	157.2	16.9	22.9	7 304.1	77.9%	0.33	Europe	
4.1	1.8	72.2	4.5	82.6	4.9%	10.7	0.4	0.6	708.3	63.6%	0.55	Oceania	

1. Total World includes Non-OECD total, OECD total as well as international bunkers. 2. Please refer to the chapter Geographical coverage.

3. GHG / GDP PPP ratio is expressed in kg of CO₂-equivalent per 2010 USD.

2015 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

	CO ₂						CH ₄					
	Fuel comb.	Fugitive	Industrial processes	Other	Total	Share of energy	Energy	Agricult.	Waste	Other	Total	Share of energy
Non-OECD Total	19 433.4	473.6	2 158.3	143.6	22 169.9	89.8%	2 655.9	3 368.8	1 278.5	127.2	7 430.4	35.7%
Albania	3.8	0.0	1.0	0.0	4.9	79.6%	0.3	1.9	0.9	0.0	3.1	8.2%
Armenia	4.7	-	0.2	0.0	4.9	96.2%	0.4	1.5	0.3	-	2.2	19.0%
Azerbaijan	30.8	0.4	1.2	0.1	32.4	96.3%	10.1	7.0	2.2	0.0	19.2	52.4%
Belarus	52.7	2.3	5.2	1.6	61.7	89.0%	0.8	10.8	8.1	0.1	19.8	4.2%
Bosnia and Herzegovina	19.2	0.6	1.0	0.0	20.9	94.9%	2.0	1.4	1.0	0.0	4.3	45.0%
Bulgaria	43.7	0.4	4.2	0.1	48.4	91.2%	1.4	1.9	5.4	0.0	8.6	15.7%
Croatia	15.5	0.0	2.2	0.1	17.8	87.2%	1.3	1.4	1.4	0.0	4.1	31.2%
Cyprus ¹	5.9	-	0.5	0.0	6.4	91.6%	0.0	0.3	1.4	-	1.7	0.8%
FYR of Macedonia	7.1	-	0.8	0.0	7.9	89.9%	0.3	0.7	1.0	0.0	2.0	14.4%
Georgia	8.4	0.0	1.5	0.1	9.9	84.3%	0.6	2.1	0.4	0.0	3.1	18.2%
Gibraltar	0.6	-	0.0	-	0.6	99.8%	0.0	-	0.0	-	0.0	5.9%
Kazakhstan	225.1	13.3	10.4	0.1	248.7	95.9%	65.8	17.3	5.3	0.1	88.5	74.4%
Kosovo	8.6	-	-	-	8.6	100.0%	-	-	-	-	-	0.0%
Kyrgyzstan	9.9	-	0.6	0.0	10.5	94.1%	0.3	4.6	1.2	-	6.0	4.5%
Lithuania	10.6	-	2.2	0.1	12.9	81.9%	0.7	2.0	1.4	0.0	4.2	17.4%
Malta	1.6	-	-	0.0	1.7	99.7%	0.0	0.0	0.0	-	0.1	2.3%
Republic of Moldova	7.6	-	0.4	0.0	8.0	94.5%	0.4	1.0	0.5	-	1.8	19.8%
Montenegro	2.4	-	-	-	2.4	100.0%	-	-	-	-	-	0.0%
Romania	69.5	0.1	6.5	0.2	76.3	91.2%	5.8	8.7	5.6	0.0	20.2	28.9%
Russian Federation	1 466.3	72.2	101.3	2.6	1 642.5	93.7%	275.0	58.2	91.1	31.7	456.0	60.3%
Serbia	44.5	1.0	1.9	0.1	47.4	95.9%	1.7	3.5	5.1	0.0	10.4	16.2%
Tajikistan	4.2	-	0.7	0.0	5.0	84.9%	0.5	5.3	1.1	-	6.9	6.8%
Turkmenistan	69.1	3.6	1.7	0.4	74.8	97.3%	33.0	9.5	1.0	-	43.5	75.9%
Ukraine	187.6	9.5	19.1	1.9	218.1	90.4%	35.4	13.0	12.1	0.1	60.6	58.4%
Uzbekistan	88.6	2.1	5.8	0.6	97.1	93.4%	24.6	26.2	4.5	0.0	55.3	44.5%
Non-OECD Europe and Eurasia	2 388.0	105.6	168.2	8.2	2 669.8	93.4%	460.1	178.3	151.0	32.0	821.5	56.0%
Algeria	130.4	17.0	10.8	0.1	158.4	93.1%	57.6	7.5	8.8	0.0	73.8	78.0%
Angola	19.8	8.2	2.0	0.0	30.0	93.0%	27.5	47.7	4.7	2.1	82.0	33.5%
Benin	5.3	-	0.5	0.0	5.8	91.3%	1.2	3.5	1.8	-	6.5	18.4%
Botswana	7.1	-	0.0	0.0	7.1	99.7%	0.8	3.1	0.5	-	4.3	17.6%
Cameroon	5.9	2.1	0.7	0.2	9.0	90.2%	13.1	11.2	4.3	0.3	28.9	45.2%
Congo	2.7	2.3	0.2	0.0	5.3	95.5%	7.8	2.8	0.9	0.1	11.7	67.0%
Côte d'Ivoire	9.7	0.2	0.9	0.3	11.0	89.0%	6.0	4.6	3.4	0.0	14.1	42.5%
Dem. Rep. of the Congo	2.7	0.4	0.2	0.0	3.3	94.0%	9.4	56.6	13.7	5.4	85.2	11.1%
Egypt	199.6	5.5	28.6	2.7	236.3	86.8%	28.2	16.7	14.2	0.0	59.1	47.7%
Eritrea	0.6	-	0.1	0.0	0.7	84.4%	0.5	2.7	0.8	-	4.0	12.2%
Ethiopia	10.2	-	1.9	0.5	12.6	81.1%	24.3	63.5	13.7	0.4	101.9	23.9%
Gabon	3.2	3.1	0.1	0.0	6.4	99.1%	7.4	0.4	0.4	-	8.3	89.5%
Ghana	14.1	0.3	1.1	0.0	15.4	92.9%	6.9	6.8	5.0	0.1	18.7	36.7%
Kenya	14.1	-	2.5	0.1	16.8	84.5%	11.3	27.6	6.9	-	45.8	24.7%
Libya	41.9	4.5	1.8	0.0	51.9	89.5%	12.1	1.6	1.9	0.1	15.7	76.9%
Mauritius	4.0	-	0.0	0.0	4.0	99.7%	0.2	0.0	0.2	-	0.4	45.0%
Morocco	55.4	-	5.4	0.7	61.5	90.0%	0.4	7.5	7.0	-	15.0	2.8%
Mozambique	5.1	0.0	1.4	0.0	6.5	77.9%	5.8	25.9	4.6	0.5	36.8	15.7%
Namibia	3.8	-	0.2	0.0	4.1	93.5%	0.1	5.0	0.5	-	5.6	1.4%
Niger	2.0	0.1	0.0	0.0	2.1	98.8%	2.3	17.2	2.8	-	22.3	10.4%
Nigeria	82.7	14.8	6.9	0.2	104.6	93.2%	107.2	46.1	30.2	0.1	183.6	58.4%
Senegal	7.5	-	1.7	0.0	9.2	81.9%	1.4	6.1	2.4	0.0	9.9	13.8%
South Africa	410.1	26.8	15.5	0.9	453.5	96.3%	38.7	26.2	16.1	0.2	81.3	47.7%
South Sudan	2.0	-	-	-	2.0	100.0%	-	-	-	-	-	0.0%
Sudan	15.6	1.1	1.2	0.1	17.9	92.6%	8.5	80.0	8.4	0.2	97.1	8.8%
United Rep. of Tanzania	11.6	-	1.0	0.1	12.7	91.7%	9.2	39.3	8.8	0.3	57.5	15.9%
Togo	1.9	-	0.5	0.0	2.4	78.6%	2.0	2.0	1.2	0.0	5.1	38.6%
Tunisia	25.6	1.1	3.4	0.2	30.2	88.4%	4.2	2.4	2.3	-	8.9	46.8%
Zambia	3.3	-	0.8	0.0	4.1	81.2%	4.4	29.5	2.9	0.7	37.6	11.6%
Zimbabwe	11.8	0.1	0.8	0.0	12.7	93.6%	2.9	8.1	2.5	0.1	13.5	21.4%
Other Africa	31.3	1.7	3.1	0.1	36.5	90.2%	32.2	150.2	31.5	1.2	215.1	15.0%
Africa	1 141.0	89.0	93.2	6.4	1 333.9	92.2%	433.4	702.0	202.4	11.9	1 349.8	32.1%

1. Please refer to the chapter Geographical coverage.

2015 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

Energy	N ₂ O					Share of energy	HFCs	PFCs	SF ₆	Total			
	Industrial processes	Agriculture	Other	Total	Industrial processes		Total	Share of energy	GHG / GDP PPP ²				
166.9	62.3	1 626.8	292.7	2 148.8	7.8%	283.8	20.7	92.5	32 146.2	70.6%	0.56	Non-OECD Total	
0.0	-	0.7	0.1	0.9	5.2%	0.1	-	-	9.0	46.5%	0.29	Albania	
0.0	-	0.6	0.1	0.8	2.0%	0.6	-	-	8.4	61.1%	0.36	Armenia	
0.2	-	2.2	0.3	2.7	7.1%	0.1	0.1	-	54.4	76.2%	0.34	Azerbaijan	
0.5	15.0	9.1	0.5	25.1	1.9%	0.7	0.0	-	107.3	52.4%	0.67	Belarus	
0.2	-	0.7	0.2	1.1	16.5%	0.7	0.1	-	27.1	81.1%	0.73	Bosnia and Herzegovina	
0.3	0.1	2.1	0.4	2.9	9.8%	0.6	0.0	-	60.6	75.6%	0.51	Bulgaria	
0.1	0.8	1.4	0.2	2.5	5.7%	0.1	0.0	-	24.5	69.1%	0.29	Croatia	
0.0	-	0.1	0.1	0.3	10.7%	0.3	-	-	8.7	68.2%	0.34	Cyprus ¹	
0.0	-	0.3	0.1	0.5	8.4%	0.2	-	-	10.6	70.2%	0.40	FYR of Macedonia	
0.1	0.8	1.0	0.1	2.0	3.7%	0.0	-	-	15.0	60.0%	0.46	Georgia	
0.0	-	-	0.0	0.0	33.3%	-	-	-	0.6	96.3%	0.62	Gibraltar	
1.1	-	12.0	1.5	14.6	7.4%	0.6	-	-	352.3	86.6%	0.87	Kazakhstan	
-	-	-	-	-	0.0%	-	-	-	8.6	100.0%	0.54	Kosovo	
0.0	-	1.4	0.2	1.6	2.3%	0.0	-	-	18.2	56.1%	0.96	Kyrgyzstan	
0.1	2.6	2.8	0.2	5.6	2.0%	1.1	0.0	-	23.8	47.9%	0.32	Lithuania	
0.0	-	0.0	0.0	0.1	8.7%	0.2	-	-	2.0	83.2%	0.14	Malta	
0.0	-	0.6	0.1	0.8	4.4%	0.0	-	-	10.6	75.1%	0.64	Republic of Moldova	
-	-	-	-	-	0.0%	-	-	-	2.4	100.0%	0.25	Montenegro	
0.5	2.6	6.5	0.9	10.6	5.1%	0.7	0.2	0.0	107.9	70.3%	0.28	Romania	
6.3	18.6	32.6	30.2	87.6	7.2%	33.5	10.2	9.1	2 239.0	81.3%	0.70	Russian Federation	
0.3	0.2	2.0	0.4	2.9	11.6%	7.0	0.1	-	67.8	70.1%	0.76	Serbia	
0.0	-	1.6	0.1	1.7	0.7%	0.0	0.1	-	13.7	34.3%	0.62	Tajikistan	
0.1	0.9	3.9	0.2	5.1	2.0%	0.1	-	-	123.5	85.7%	1.51	Turkmenistan	
1.2	6.4	12.5	2.3	22.3	5.3%	0.4	0.2	0.5	302.0	77.4%	0.96	Ukraine	
0.3	0.1	11.6	0.7	12.6	2.2%	1.0	-	-	166.0	69.6%	0.95	Uzbekistan	
11.5	47.9	106.0	38.8	204.2	5.6%	48.0	10.9	9.6	3 763.9	78.8%	0.68	Non-OECD Europe and Eurasia	
0.3	1.2	6.1	1.2	8.8	3.8%	0.3	-	0.4	241.7	85.0%	0.45	Algeria	
0.4	-	30.1	2.0	32.6	1.3%	0.0	-	-	144.6	38.7%	0.85	Angola	
0.1	-	2.3	0.2	2.6	4.9%	-	-	-	14.9	44.4%	0.72	Benin	
0.1	-	1.7	0.1	1.9	3.8%	-	-	-	13.3	59.4%	0.40	Botswana	
0.3	-	6.2	0.7	7.2	3.9%	-	0.1	-	45.2	47.4%	0.61	Cameroon	
0.1	-	2.0	0.2	2.2	2.3%	0.0	-	-	19.2	67.4%	0.71	Congo	
0.3	-	3.3	0.4	4.0	8.0%	-	-	-	29.1	55.4%	0.40	Côte d'Ivoire	
1.2	-	36.2	4.3	41.6	2.8%	-	-	-	130.1	10.5%	2.32	Dem. Rep. of the Congo	
1.3	5.4	15.8	2.6	25.1	5.0%	0.5	0.5	1.4	322.9	72.6%	0.35	Egypt	
0.0	-	1.2	0.0	1.3	1.9%	-	-	-	6.0	18.7%	0.75	Eritrea	
1.8	-	33.9	2.1	37.8	4.8%	0.0	-	-	152.3	23.9%	1.02	Ethiopia	
0.1	-	0.3	0.1	0.5	21.3%	0.0	-	-	15.2	91.3%	0.48	Gabon	
0.3	-	3.8	0.6	4.7	7.0%	0.0	-	-	38.8	55.4%	0.37	Ghana	
0.6	-	12.7	0.9	14.2	4.5%	-	-	-	76.8	34.0%	0.59	Kenya	
0.2	-	0.8	0.4	1.3	14.9%	-	-	0.4	69.3	89.9%	1.47	Libya	
0.0	-	0.1	0.1	0.2	15.3%	0.0	-	-	4.6	90.7%	0.20	Mauritius	
0.4	-	5.4	0.9	6.8	6.5%	-	-	-	83.3	67.5%	0.33	Morocco	
0.4	-	17.1	0.9	18.4	2.0%	0.1	0.1	-	61.9	18.1%	2.02	Mozambique	
0.1	-	2.5	0.1	2.7	4.8%	-	-	-	12.4	32.5%	0.52	Namibia	
0.3	-	7.7	0.4	8.3	3.0%	-	-	-	32.7	14.3%	1.85	Niger	
5.3	-	22.5	5.0	32.7	16.1%	0.6	0.0	0.4	322.0	65.2%	0.32	Nigeria	
0.1	-	2.7	0.2	3.0	2.0%	-	-	-	22.0	40.6%	0.65	Senegal	
2.9	0.0	15.4	3.2	21.5	13.3%	0.8	0.2	1.8	559.0	85.6%	0.83	South Africa	
-	-	-	-	-	0.0%	-	-	-	2.0	100.0%	0.10	South Sudan	
0.4	-	41.1	1.1	42.7	1.0%	-	-	-	157.8	16.2%	0.97	Sudan	
0.9	-	20.6	1.5	23.0	4.0%	-	-	-	93.3	23.3%	0.73	United Rep. of Tanzania	
0.1	-	1.3	0.1	1.5	5.3%	-	-	-	9.0	43.7%	0.92	Togo	
0.2	0.3	1.7	0.3	2.6	8.1%	-	-	-	41.7	74.5%	0.35	Tunisia	
0.3	0.3	22.0	0.9	23.5	1.4%	0.0	-	-	65.1	12.3%	1.14	Zambia	
0.4	-	4.2	0.5	5.1	7.5%	-	-	-	31.3	48.4%	1.06	Zimbabwe	
2.9	-	72.1	4.5	79.6	3.7%	0.1	-	-	331.3	20.7%	0.87	Other Africa	
21.8	7.3	392.7	35.4	457.2	4.8%	2.5	0.9	4.4	3 148.7	53.7%	0.59	Africa	

1. Please refer to the chapter Geographical coverage.

2. GHG / GDP PPP ratio is expressed in kg of CO₂-equivalent per 2010 USD.

2015 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

	CO ₂						CH ₄					
	Fuel comb.	Fugitive	Industrial processes	Other	Total	Share of energy	Energy	Agricult.	Waste	Other	Total	Share of energy
Bangladesh	70.9	0.1	7.6	1.2	79.3	89.5%	11.0	88.2	22.6	0.2	122.0	9.0%
Brunei Darussalam	6.0	0.2	0.1	0.0	6.4	97.6%	5.0	0.0	0.1	0.0	5.1	97.4%
Cambodia	8.0	-	0.6	0.0	8.6	93.1%	2.8	19.1	2.2	0.3	24.5	11.5%
DPR of Korea	22.5	-	3.5	0.1	26.2	86.0%	12.3	4.3	6.5	0.1	23.3	52.9%
India	2 026.1	13.7	162.5	29.2	2 244.4	90.9%	108.2	474.1	183.2	3.1	768.5	14.1%
Indonesia	454.6	5.4	34.4	5.7	489.9	93.9%	128.1	122.9	62.8	38.0	351.8	36.4%
Malaysia	220.4	7.0	17.2	4.2	248.9	91.4%	36.9	5.9	7.7	0.9	51.4	71.9%
Mongolia	17.1	0.1	0.2	0.0	17.4	98.8%	8.0	13.4	0.6	0.1	22.1	36.1%
Myanmar	18.7	0.1	0.3	0.2	25.1	75.0%	9.0	75.7	8.9	4.9	98.6	9.2%
Nepal	5.7	-	0.7	0.1	6.5	87.5%	3.1	23.3	3.3	0.4	30.2	10.4%
Pakistan	150.8	1.1	16.0	2.8	170.7	89.0%	23.0	143.4	26.8	0.0	193.3	11.9%
Philippines	103.9	0.3	9.2	1.1	114.5	91.0%	9.9	42.7	18.3	0.0	70.9	14.0%
Singapore	44.2	-	6.5	0.2	50.3	87.9%	0.5	0.0	2.2	0.0	2.8	18.7%
Sri Lanka	19.5	-	0.8	0.7	21.0	92.6%	1.2	8.6	2.6	0.0	12.4	9.4%
Chinese Taipei	250.7	2.4	14.8	1.0	268.9	94.2%	1.1	2.6	6.5	0.0	10.3	10.8%
Thailand	248.1	0.8	22.3	1.1	272.0	91.5%	27.2	64.6	15.9	1.0	108.8	25.0%
Viet Nam	168.7	2.0	26.8	2.8	200.0	85.4%	26.7	70.8	15.8	0.8	114.1	23.4%
Other non-OECD Asia	36.8	0.3	1.9	0.1	41.9	88.6%	4.2	26.2	7.0	2.3	39.7	10.5%
Asia (excl. China)	3 872.8	33.6	325.5	50.6	4 292.0	91.0%	418.3	1 186.1	393.1	52.2	2 049.7	20.4%
People's Rep. of China	9 102.7	139.5	1 316.9	65.8	10 582.3	87.3%	759.5	591.2	288.3	9.2	1 648.3	46.1%
Hong Kong, China	43.9	1.3	0.6	0.1	45.9	98.6%	0.1	0.0	2.0	-	2.2	5.5%
China	9 146.6	140.8	1 317.5	65.9	10 628.2	87.4%	759.6	591.3	290.3	9.2	1 650.4	46.0%
Argentina	190.4	2.8	8.8	1.1	204.0	94.7%	22.0	88.3	10.6	0.7	121.6	18.1%
Bolivia	18.2	0.1	1.2	0.0	19.6	93.5%	8.8	16.8	2.2	1.6	29.4	30.0%
Brazil	451.5	2.6	40.6	6.6	501.3	90.6%	41.1	382.5	89.4	16.2	529.3	7.8%
Colombia	78.3	2.0	4.8	0.3	84.3	95.3%	16.4	40.8	10.8	0.1	68.0	24.1%
Costa Rica	6.9	-	0.5	0.1	7.5	92.2%	0.1	2.6	0.9	0.0	3.7	3.7%
Cuba	26.8	0.2	0.7	0.1	27.8	97.1%	1.3	7.1	4.8	0.1	13.3	9.5%
Curaçao ¹	4.7	-	0.1	0.0	4.7	98.8%	0.1	0.0	0.0	-	0.1	78.9%
Dominican Republic	21.5	-	1.6	0.2	23.4	91.9%	0.4	6.2	4.1	0.1	10.8	3.3%
Ecuador	36.8	2.6	2.2	0.2	41.8	94.2%	10.0	10.3	3.1	-	23.3	42.7%
El Salvador	6.5	-	0.3	0.6	7.4	87.8%	0.2	1.7	1.0	0.0	2.9	7.9%
Guatemala	15.2	0.1	1.1	0.4	16.8	90.7%	2.1	6.1	2.7	0.1	10.9	19.0%
Haiti	3.2	-	0.2	0.0	3.5	93.0%	3.7	2.8	3.3	-	9.8	37.8%
Honduras	9.2	-	0.5	0.0	9.8	94.4%	0.6	5.5	1.3	0.1	7.6	7.4%
Jamaica	7.0	-	0.3	0.0	7.4	95.0%	0.5	0.4	0.8	-	1.7	30.2%
Nicaragua	5.1	-	0.3	0.0	5.5	94.0%	0.4	7.2	1.2	0.0	8.8	4.4%
Panama	10.7	-	0.7	0.0	11.4	93.7%	0.1	2.9	0.7	0.0	3.8	3.6%
Paraguay	5.7	-	0.5	0.0	6.2	92.4%	1.4	22.0	1.4	0.5	25.3	5.4%
Peru	48.8	0.5	4.1	0.3	54.1	91.2%	7.4	13.4	5.9	0.1	26.8	27.7%
Suriname	2.1	-	0.1	0.0	2.1	97.3%	0.0	0.6	0.1	0.0	0.8	6.2%
Trinidad and Tobago	21.7	0.3	15.8	0.0	37.8	58.1%	13.5	0.1	2.0	0.3	15.9	85.0%
Uruguay	6.4	-	0.3	0.1	6.7	94.6%	0.2	21.3	2.9	-	24.5	0.9%
Venezuela	140.5	20.9	6.6	0.5	166.3	97.1%	44.3	31.3	8.6	0.9	85.1	52.1%
Other non-OECD Americas	20.3	0.0	0.3	0.0	20.7	98.4%	0.3	3.0	3.0	0.1	6.4	5.3%
Non-OECD Americas	1 137.4	32.0	91.8	10.5	1 269.8	92.1%	174.9	672.8	160.9	20.9	1 029.5	17.0%
Bahrain	30.1	0.1	3.0	0.0	33.1	91.0%	5.1	0.0	0.7	0.0	5.9	87.0%
Islamic Republic of Iran	553.3	24.4	42.4	0.9	621.0	93.0%	123.6	17.3	28.8	0.2	169.9	72.7%
Iraq	130.4	31.9	4.4	0.3	168.0	96.6%	52.3	4.4	10.4	-	67.2	77.9%
Jordan	23.8	0.0	1.8	0.0	25.6	92.9%	0.1	0.6	3.1	-	3.8	3.1%
Kuwait	90.6	1.8	5.4	0.0	92.5	99.8%	23.2	0.2	2.1	0.0	25.5	91.0%
Lebanon	22.8	-	2.0	0.0	24.8	91.9%	0.1	0.4	2.1	-	2.6	4.2%
Oman	63.6	4.7	6.9	0.0	75.7	90.3%	21.5	1.0	2.1	0.1	24.7	87.1%
Qatar	77.6	1.6	13.4	0.0	94.8	83.5%	69.2	0.3	2.1	0.1	71.7	96.6%
Saudi Arabia	531.6	4.2	66.1	0.4	602.3	89.0%	71.3	3.4	15.5	0.5	90.7	78.6%
Syrian Arab Republic	26.0	1.0	1.3	0.1	28.4	95.0%	3.7	4.1	4.8	-	12.6	29.1%
United Arab Emirates	186.6	1.6	14.1	0.2	196.2	95.9%	29.2	1.2	4.1	0.0	34.6	84.5%
Yemen	11.4	1.2	1.2	0.0	13.8	91.0%	10.2	5.4	4.9	-	20.5	49.8%
Middle East	1 747.6	72.5	162.1	2.0	1 976.3	92.1%	409.5	38.3	80.8	0.9	529.5	77.3%

1. Please refer to the chapter Geographical coverage.

2015 Greenhouse-gas emissions

million tonnes of CO₂ equivalent using GWP-100

Energy	N ₂ O					Share of energy	HFCs	PFCs	SF ₆	Total			
	Industrial processes	Agriculture	Other	Total	Industrial processes		Total	Share of energy	GHG / GDP PPP ²				
0.9	-	16.1	2.4	19.4	4.5%	-	-	-	220.7	37.4%	0.45	Bangladesh	
0.0	-	0.1	0.0	0.1	8.8%	0.4	-	-	12.0	93.1%	0.39	Brunei Darussalam	
0.2	-	2.6	0.5	3.4	6.7%	-	-	-	36.5	30.3%	0.73	Cambodia	
0.3	-	1.9	0.6	2.8	9.1%	4.4	-	-	56.7	61.9%	0.56	DPR of Korea	
25.0	0.3	194.0	32.8	252.1	9.9%	17.7	0.7	5.5	3 288.9	66.5%	0.45	India	
5.4	0.2	66.9	31.4	103.9	5.2%	-	0.0	1.1	946.8	61.6%	0.36	Indonesia	
1.4	0.8	9.7	1.9	13.7	9.9%	0.1	0.2	0.8	315.0	84.4%	0.42	Malaysia	
0.1	-	6.1	0.2	6.5	2.2%	-	-	-	46.0	55.0%	1.38	Mongolia	
0.7	-	17.6	4.3	22.6	3.2%	-	-	-	146.3	23.4%	0.56	Myanmar	
0.6	-	3.7	0.9	5.1	11.1%	-	-	-	41.8	22.5%	0.64	Nepal	
2.1	0.0	41.7	4.0	47.8	4.5%	-	-	1.0	412.8	42.9%	0.47	Pakistan	
0.7	0.0	12.9	1.8	15.3	4.4%	-	-	0.4	201.1	57.1%	0.29	Philippines	
0.1	0.7	0.0	0.9	1.7	5.7%	2.2	0.4	0.4	57.8	76.4%	0.13	Singapore	
0.3	-	2.5	0.6	3.4	9.0%	-	-	-	36.9	56.9%	0.16	Sri Lanka	
1.3	0.7	1.7	1.2	4.9	26.1%	0.1	1.7	4.8	290.7	87.9%	0.29	Chinese Taipei	
5.2	0.5	14.3	3.0	23.0	22.8%	-	-	1.3	405.2	69.4%	0.40	Thailand	
1.5	-	18.0	3.3	22.7	6.4%	-	-	-	336.8	58.9%	0.66	Viet Nam	
0.3	-	8.7	2.5	11.6	2.7%	0.1	-	-	93.2	47.6%	0.42	Other non-OECD Asia	
46.2	3.2	418.6	92.3	560.2	8.2%	25.0	2.9	15.4	6 945.2	63.1%	0.41	Asia (excl. China)	
66.9	1.1	373.8	71.1	512.9	13.0%	199.1	3.8	53.8	13 000.3	77.1%	0.71	People's Rep. of China	
0.2	-	0.0	0.3	0.5	41.3%	-	-	0.1	48.6	93.6%	0.13	Hong Kong, China	
67.1	1.1	373.8	71.4	513.4	13.1%	199.1	3.8	54.0	13 048.9	77.2%	0.70	China	
1.6	0.1	50.0	2.4	54.2	3.0%	0.4	0.0	0.4	380.7	57.2%	0.47	Argentina	
0.4	-	7.3	1.4	9.1	4.2%	-	-	-	58.1	47.4%	0.85	Bolivia	
8.1	1.0	167.8	19.2	196.1	4.2%	3.2	1.9	1.5	1 233.2	40.8%	0.42	Brazil	
0.8	0.1	16.3	1.2	18.4	4.4%	-	-	0.1	170.8	56.4%	0.28	Colombia	
0.1	0.0	1.2	0.2	1.5	6.6%	0.1	-	-	12.8	56.0%	0.18	Costa Rica	
0.2	0.5	5.0	0.4	6.0	2.6%	0.2	-	-	47.3	60.0%	0.21	Cuba	
0.0	-	0.0	0.0	0.1	30.4%	-	-	-	4.9	97.6%	2.92	Curaçao ¹	
0.1	-	2.4	0.4	2.9	4.8%	-	-	-	37.1	59.5%	0.27	Dominican Republic	
0.2	-	4.0	0.7	4.9	5.0%	0.1	-	-	70.1	70.7%	0.41	Ecuador	
0.1	-	1.0	0.2	1.2	5.1%	0.1	-	-	11.6	58.2%	0.24	El Salvador	
0.4	-	3.0	0.4	3.8	11.1%	0.8	-	-	32.3	54.8%	0.28	Guatemala	
0.1	-	1.2	0.2	1.5	9.8%	-	-	-	14.7	47.8%	0.85	Haiti	
0.1	-	2.6	0.4	3.2	4.6%	-	-	-	20.5	48.5%	0.54	Honduras	
0.1	-	0.2	0.1	0.4	13.0%	0.1	-	-	9.6	79.0%	0.42	Jamaica	
0.1	-	3.6	0.2	3.8	2.2%	-	-	-	18.1	31.1%	0.61	Nicaragua	
0.1	-	1.0	0.2	1.3	6.0%	-	-	-	16.4	66.3%	0.20	Panama	
0.1	-	8.7	0.5	9.4	1.5%	-	-	-	40.8	17.6%	0.73	Paraguay	
0.3	-	5.8	0.9	7.0	4.0%	0.5	-	-	88.4	64.9%	0.24	Peru	
0.0	-	0.1	0.1	0.2	15.3%	-	-	-	3.1	69.4%	0.39	Suriname	
0.1	-	8.1	0.1	8.3	0.9%	0.1	-	-	62.0	57.2%	1.49	Trinidad and Tobago	
0.7	0.0	12.4	2.1	15.2	4.4%	1.7	0.1	0.3	48.4	15.0%	0.73	Uruguay	
0.2	-	2.3	0.4	2.9	5.6%	0.0	-	0.0	254.3	80.1%	0.54	Venezuela	
0.2	-	2.3	0.4	2.9	5.6%	0.0	-	0.0	30.0	69.4%	0.68	Other non-OECD Americas	
14.2	1.7	306.3	32.2	354.3	4.0%	7.3	2.1	2.3	2 665.3	50.9%	0.41	Non-OECD Americas	
0.0	-	0.0	0.1	0.2	19.1%	-	0.1	-	39.2	89.9%	0.66	Bahrain	
2.9	0.8	15.5	8.0	27.2	10.5%	-	0.0	2.9	821.0	85.8%	0.64	Islamic Republic of Iran	
0.5	-	3.6	3.1	7.2	7.4%	-	-	0.1	242.5	89.2%	0.46	Iraq	
0.1	-	0.4	0.6	1.1	4.9%	0.2	-	-	30.7	78.0%	0.40	Jordan	
0.2	-	0.1	0.5	0.8	22.1%	0.9	-	0.5	120.3	91.9%	0.46	Kuwait	
0.1	-	0.4	0.5	1.0	7.4%	-	-	-	28.4	80.7%	0.37	Lebanon	
0.1	-	0.5	0.6	1.2	11.0%	0.3	0.0	-	101.9	88.6%	0.62	Oman	
0.1	-	0.1	0.3	0.6	19.0%	-	-	-	167.0	90.2%	0.57	Qatar	
1.2	-	2.3	4.7	8.2	14.9%	0.3	-	2.5	704.0	86.4%	0.45	Saudi Arabia	
0.2	0.3	2.7	1.3	4.4	4.5%	-	-	-	45.4	68.0%	1.21	Syrian Arab Republic	
0.3	-	0.6	1.4	2.4	12.2%	-	0.1	1.0	234.2	90.2%	0.40	United Arab Emirates	
0.5	-	3.1	1.5	5.1	9.9%	-	-	-	39.4	59.0%	0.57	Yemen	
6.2	1.1	29.4	22.7	59.4	10.4%	1.7	0.2	6.9	2 574.0	86.6%	0.51	Middle East	

1. Please refer to the chapter Geographical coverage.

2. GHG / GDP PPP ratio is expressed in kg of CO₂-equivalent per 2010 USD.

Energy Data Officer/Statistician

Possible staff vacancies

International Energy Agency, Paris, France

The IEA

The International Energy Agency, based in Paris, acts as energy policy advisor to 30 member countries in their effort to ensure reliable, affordable and clean energy for their citizens. Founded during the oil crisis of 1973-74, the initial role of the IEA was to co-ordinate measures in times of oil supply emergencies. As energy markets have changed, so has the IEA. Its mandate has broadened to incorporate the “Three E’s” of balanced energy policy making: energy security, economic development and environmental protection. Current work focuses on climate change policies, market reform, energy technology collaboration and outreach to the rest of the world, especially major consumers and producers of energy like China, India, Russia and the OPEC countries.

The Energy Data Centre, with a staff of around 30 people, provides a dynamic environment for young people just finishing their studies or with one to two years of work experience.

Job description

The data officers/statisticians compile, verify and disseminate information on all aspects of energy including production, transformation and consumption of all fuels, energy efficiency indicators, CO₂ emissions, and energy prices and taxes. The data officers are responsible for the production of data sets through receiving, reviewing and inputting data submissions from member countries and other sources. They check for completeness, correct calculations, internal consistency, accuracy and consistency with definitions. Often this entails proactively investigating and helping to resolve anomalies in collaboration with national administrations. The data officers/statisticians also design and implement computer macros used in the preparation of their energy statistics publication(s) alongside analysis of the data.

Principal qualifications

- University degree in a topic relevant to energy, or statistics. We currently have staff with degrees in mathematics, statistics, information technology, economics, engineering, physics, environmental studies, etc.
- Experience in the basic use of databases and computer software. Experience in Visual Basic is an advantage.
- Ability to work accurately, pay attention to detail and work to deadlines; ability to deal simultaneously with a wide variety of tasks and to organise work efficiently.
- Good communication skills; ability to work well in a team and in a multicultural environment, particularly in liaising with contacts in national administrations and industry; ability to understand, and communicate data.
- An excellent written and oral command of English; knowledge of other languages would be an asset.
- Some knowledge of energy industry operations and terminology would also be an advantage, but is not required.

Nationals of any IEA member country are eligible for appointment. Basic salaries start at 3 300 euros per month. The possibilities for advancement are good for candidates with appropriate qualifications and experience. Tentative enquiries about future vacancies are welcomed from men and women with relevant qualifications and experience. Applications in English, accompanied by a curriculum vitae, should be sent to:

Office of Management and Administration
International Energy Agency
31-35 rue de la Fédération
75739 Paris Cedex 15, France

Online data services

Users can instantly access not only all the data published in this book, but also all the time series used for preparing this publication and all the other statistics publications of the IEA. The data are available online, either through annual subscription or pay-per-view access. More information on this service can be found on our website at <http://data.iea.org>.

Nine annual publications

■ World Energy Statistics 2018

World Energy Statistics provides comprehensive world energy statistics on all energy sources – coal, gas, oil, electricity, renewables and waste. It covers energy supply and consumption for 150 countries and regions, including all OECD countries, over 100 other key energy producing and consuming countries, as well as world totals and various regional aggregates. The book includes detailed tables by country in original units, and summary time series on production, trade, and final consumption by sector.

Published August 2018 - Price: Print €120; PDF €96

■ World Energy Balances 2018

World Energy Balances provides comprehensive energy balances for all the world's largest energy producing and consuming countries. It contains detailed data on the supply and consumption of energy for 150 countries and regions, including all OECD countries, over 100 other key energy producing and consuming countries, as well as world totals and various regional aggregates. The book includes graphs and detailed data by country for all energy sources – coal, gas, oil, electricity, renewables and waste - expressed in balance format. Alongside this, there are summary time series on production, trade, final consumption by sector, as well as key energy and economic indicators and an overview of trends in global energy production and use.

Published August 2018 - Price: Print €120; PDF €96

■ Coal Information 2018

Coal Information provides a comprehensive review of historical and current market trends in the world coal sector. It provides an overview of world coal developments covering coal production and coal reserves, coal demand by type, coal trade and coal prices. A detailed and comprehensive statistical picture of historical and current coal developments in the 35 OECD member countries, by region and individually is presented in tables and charts. Complete coal balances and coal trade data for selected years are presented on 22 major non-OECD coal-producing and -consuming countries, with summary statistics on coal supply and end-use statistics for about 40 countries and regions worldwide.

Published August 2018 - Price: Print €165; PDF €132

■ Electricity Information 2018

Electricity Information provides a comprehensive review of historical and current market trends in the OECD electricity sector. It provides an overview of the world electricity developments covering world electricity and heat production, input fuel mix, supply and consumption, and electricity imports and exports. More detail is provided for the 35 OECD countries with information covering production, installed capacity, input energy mix to electricity and heat production, consumption, electricity trades, input fuel prices and end-user electricity prices. It provides comprehensive statistical details on overall energy consumption, economic indicators, electricity and heat production by energy form and plant type, electricity imports and exports, sectoral energy and electricity consumption, as well as prices for electricity and electricity input fuels for each country and regional aggregate.

Published August 2018 - Price: Print €150; PDF €120

■ Natural Gas Information 2018

Natural Gas Information is a detailed reference work on gas supply and demand covering OECD countries and the rest of the world. The publication contains essential information on LNG and pipeline trade, gas reserves, storage capacity and prices. The main part of the book concentrates on OECD countries, showing a detailed supply and demand balance for each country and for the three OECD regions: Americas, Asia-Oceania and Europe, as well as a breakdown of gas consumption by end user. Import and export data are reported by source and destination.

Published August 2018 - Price: Print €165; PDF €132

■ Oil Information 2018

Oil Information is a comprehensive reference book on current developments in oil supply and demand. This publication contains key data on world production, trade, prices and consumption of major oil product groups, with time series back to the early 1970s. Its core consists of a detailed and comprehensive picture of oil supply, demand, trade, production and consumption by end-user for each OECD country individually and for the OECD regions. Trade data are reported extensively by origin and destination.

Published August 2018 - Price: Print €165; PDF €132

■ Renewables Information 2018

Renewables Information provides a comprehensive review of historical and current market trends in OECD countries. It provides an overview of the development of renewables and waste in the world since 1990. A greater focus is given to the OECD countries with a review of electricity generation and capacity from renewable and waste energy sources, including detailed tables. However, an overview of developments in the world and OECD renewable and waste market is also presented. The publication encompasses energy indicators, generating capacity, electricity and heat production from renewable and waste sources, as well as production and consumption of renewables and waste.

Published August 2018 - Price: Print €110; PDF €88

■ CO₂ Emissions from Fuel Combustion 2018

CO₂ Emissions from Fuel Combustion provides a full analysis of emissions stemming from energy use. The data in this book cover the emissions of CO₂ for 150 countries and regions by sector and by fuel. The publication contains estimates of CO₂ emissions, selected indicators such as CO₂/GDP, CO₂/capita and CO₂/TPES and a decomposition of CO₂ emissions into driving factors for more than 150 countries and regions. Emissions are calculated using IEA energy databases and the default methods and emission factors from the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

Published November 2018 - Price: Print €165; PDF €132

■ Energy Efficiency Indicators Highlights 2018

Energy Efficiency Indicators Highlights is designed to help understand what drives final energy use in IEA member countries in order to improve and track national energy efficiency policies. It provides the first comprehensive selection of data that the IEA has been collecting each year after its member states recognised in 2009 the need to better monitor energy efficiency policies. The report includes country-specific analysis of end uses across the largest sectors – residential, services, industry and transport. It answers questions such as:

- What are the largest drivers for energy use trends in each country?
- Was energy saved because of efficiency progress over time?
- How much energy is used for space heating, appliances or cooking?
- What are the most energy-intensive industries?

Improving energy efficiency is a critical step for governments to take to move towards a sustainable energy system. This report highlights the key role of end-use energy data and indicators in monitoring progress in energy efficiency around the world.

Published December 2018 - Free pdf

Two quarterlies

■ Oil, Gas, Coal and Electricity

Oil, Gas, Coal and Electricity provides detailed and up-to-date quarterly statistics on oil, natural gas, coal and electricity for the OECD countries. Oil statistics cover production, trade, refinery intake and output, stock changes and consumption for crude oil, NGL and nine selected product groups. Statistics for electricity, natural gas and coal show supply and trade. Oil and coal import and export data are reported by origin and destination. Gas imports and exports data are reported by entries and exits of physical flows. Moreover, oil and coal production are reported on a worldwide basis.

Published Quarterly - Price €120, annual subscription: Print €380; PDF €304

■ Energy Prices and Taxes

Energy Prices and Taxes provides up-to-date information on prices and taxes in national and international energy markets. It contains crude oil import prices by crude stream, industry prices and consumer prices. The end-user prices for OECD member countries cover main oil products, gas, coal and electricity. Every issue includes full notes on sources and methods and a description of price and tax components in each country.

Published Quarterly - Price €120, annual subscription: Print €380; PDF €304

Electronic editions

To complement its publications, the Energy Data Centre produces online data services containing the complete databases which are used for preparing the statistics publications. Built-in software allows you to access and manipulate all these data in a very user-friendly manner and includes graphic facilities.

Annual Databases

- World Energy Statistics 2018 Price: €800 (single user)
- World Energy Balances 2018 Price: €800 (single user)
- **World Energy Statistics and Balances 2018**
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- Energy Prices and Taxes Price: (four quarters) €900 (single user)

Other services

■ Emissions Factors 2018

The *Emissions Factors* database includes a series of indicators related to emissions from electricity and heat generation for over 150 countries and regions, based on the IEA *World Energy Balances* and *CO₂ Emissions from Fuel Combustion* data. The main factors included are: CO₂, CH₄ and N₂O emissions per kWh of electricity and heat; adjustments due trade (for OECD) and to losses; emission factors by fuel for sectors other than electricity. The database is available in Excel format.

Price: €550 (single user)

■ World Energy Prices 2018

The *World Energy Prices* data service contains annual end-use energy prices for selected products and sectors for over one hundred countries in the world. Complementing the quarterly OECD *Energy Prices and Taxes*, the world database focuses on prices for gasoline and diesel for transport; as well as electricity for households and industry.

Price: €400 (single user)

■ Energy Prices & Taxes and World Energy Prices package

This service is a package containing both the *Energy Prices and Taxes* and *World Energy Prices* online data services offered at a reduced rate.

Price: €1 100 (single user)

Detailed descriptions of all these data services are available on our website at <http://data.iea.org>.

■ The Monthly Oil Data Service

The *Monthly Oil Data Service* provides the detailed databases of historical and projected information which is used in preparing the IEA's monthly *Oil Market Report* (OMR). The *Monthly Oil Data Service* is available as an annual subscription and includes twelve monthly updates. The service comprises three packages available separately or combined. The data are released on the same day as the official release of the *Oil Market Report*.

The packages include:

- | | |
|---------------------------------------|------------------------------------|
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| ■ Field-by-Field Supply | Price: €3 080 (single user) |
| ■ Complete Service | Price: €9 200 (single user) |

A description of this service is available on our website at www.iea.org/statistics/mods.

■ The Monthly Gas Data Service

The *Monthly Gas Data Service* provides the following monthly natural gas data for OECD countries:

- Supply balances in terajoules and cubic metres;
- Production, trade, stock changes and levels where available, gross inland deliveries, own use and losses;
- Highly detailed trade data with about 50 import origins and export destinations;
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- From 2011 onwards, transit volumes are included and trade data corresponds to entries/exits.

The databases cover the time period January 1984 to current month with a time lag of two months for the most recent data.

Price: €800 (single user)

For more information consult www.iea.org/statistics/mgds.

Moreover, the IEA statistics website contains a wealth of free statistics covering oil, natural gas, coal, electricity, renewables, energy-related CO₂ emissions and more for 150 countries and regions and historic data for the last 20 years. It also contains Sankey flows to enable users to explore visually how a country's energy balance shifts over up to 40 years, starting with production and continuing through transformation to see important changes in supply mix or share of consumption. The IEA Energy Atlas offers panoramas on every aspect of energy on a global basis and for 150 individual countries, with interactive maps and customisable charts that detail and compare a host of data based on the Agency's authoritative statistics. The website also includes free headline energy data in excel format for all OECD countries and global regions from 1971 onwards as well as for Association countries from 1990 onwards.

The IEA statistics website can be accessed at www.iea.org/statistics/

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Emissions are calculated using IEA energy databases and the default methods and emission factors from the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. The IEA CO₂ emissions estimates are complemented by the EDGAR greenhouse gas data.

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