OECD Green Growth Studies

Addressing Industrial Air Pollution in Kazakhstan

REFORMING ENVIRONMENTAL PAYMENTS POLICY GUIDELINES

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Foreword

Kazakhstan aims to become among the 30 most advanced countries in the world by mid-century. At the same time, it wants to shift from a resource-intensive growth model to one that is cleaner, more innovative and more diversified. Reaching those goals will require further substantial reforms to promote greener growth, more openness and ultimately more equal access to good employment and economic opportunity.

On 21 November 2018, the government of Kazakhstan and the Organisation of Economic Co-operation and Development (OECD) signed a Memorandum of Understanding that will run until end-2022. It provides a framework for further co-operation and reflects the commitment of both parties to build on the success of the Country Programme across a number of policy areas.

In March 2018, Kazakhstan launched an ambitious process of amending the 2007 Environmental Code. This process was underpinned by a multi-stakeholder Working Group chaired by the Committee on Environmental Regulation and Control. A Concept Note on the revisions of the Code was adopted in July 2018 and subjected to inter-ministerial consultations. Completion of the drafting process of the new Code and amendments to some of the legislative acts on environmental issues was expected by September 2019, in view of an approval by the parliament in 2020.

Since July 2018, the government of Kazakhstan has asked OECD's assistance to accelerate the transformation of its system of environmental payments to become a more effective economic mechanism for environmental pollution management. This joint project, overseen by the Committee on Environmental Regulation and Control, focuses on reforming environmentally related taxes levied from industrial air pollutants. These taxes take the form of environmental payments (taxes, monetary penalties and compensation for damage). This complies with the Polluter-Pays Principle, as recognised by OECD in its Recommendation of the Council of 14th November 1974 [C(74)223].

This report reviews Kazakhstan's opportunities to reform these economic instruments, drawing on a previous analysis in 2017. This earlier analysis highlighted how the structure of the system of environmental regulation, permitting and payments impedes faster progress in improving energy efficiency and pollution control. The present report suggests possible directions both for short-term reforms – some quite technical in nature – and directions for more ambitious amendments and future OECD work with Kazakhstan. The OECD is committed to continue working with Kazakhstan on policies needed to deliver cleaner growth over the decades to come.

Payments related to waste management are the focus of a separate report that draws on the OECD's recent work on the circular economy. In particular, it focuses on schemes for Extended Producer Responsibility under the auspices of the Working Party on Resource Productivity and Waste.

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List of abbreviations

ADB: Asian Development Bank

AOP: Ambient Ozone Pollution

APMP: Ambient Particular Matter Pollution

AQS: Air Quality Standards

BAT: Best Available Techniques

BAT-AEL: Emission Levels Associated with Best Available Techniques

BREF: BAT reference document

BREF-PP: BREF for Pulp and Paper Manufacturing

CAA: Clean Air Act

CERC: Committee on Environmental Regulation and Control

CERCLA: Comprehensive Environmental Response, Compensation and Liability Act

CVM: Contingent Valuation Method

CWA: Clean Water Act

EC: European Commission

ECJ: European Court of Justice

EEA: European Environment Agency

EECCA: Eastern Europe, Caucasus and Central Asia

ELD: Environmental Liability Directive (2004/35/EC)

ELV: Emission Limit Values

EMAS: EU Eco-Management and Audit Scheme

EMEP CEIP: European Monitoring and Evaluation Programme Centre on Emission Inventories and Projections

EMS: Environmental Management System

ESG: Environmental, Social and Governance

EU: European Union

EU ETS: EU Emissions Trading System

EUR: Euro

EPOC: OECD Environment Policy Committee

EQS: Environmental Ambient Quality Standards

GGI: Green Growth Indicators

GHG: Greenhouse Gas Emission

GMO: Genetically Modified Organism

HEA: Habitat Equivalency Analysis

IED: Industrial Emissions Directive (2010/75/EU)

IEP: Integrated Environmental Permit

IGTIC: International Green Technologies and Investment Centre

IMPEL: European Union Network for the Implementation and Enforcement of Environmental Law

INECE: International Network for Environmental Compliance and Enforcement

IPPC: Integrated Pollution Prevention and Control

IPPCD: Integrated Pollution Prevention and Control Directive (2008/1/EC)

JRC: Joint Research Centre (of the European Commission)

KPI: Key Performance Indicators

LCP: Large Combustion Plant

MAC: Maximum Allowed Concentrations

MBI: Market-Based Instruments

MCI: Monthly Calculation Index

MDCR: Multi-dimensional Country Review

MNE: Ministry of National Economy of Kazakhstan

MOE: Ministry of Energy

MPD: Maximum Permissible Discharges for a project

MPE: Maximum Permissible Emissions for an operator

NGO: Non-Governmental Organisation

NH_3: Ammonia

NO_X: Nitrogen Oxides

NO_2: Nitrogen Dioxide

NMVOC: Non-Methane Volatile Organic Compounds

NRDA: Natural Resource Damage Assessment

OECD: Organisation for Economic Co-operation and Development

OPA: Oil Production Act

PM: Particulate Matter

$PM_{2.5}$: Particulate Matter – fraction of particles having an aerodynamic diameter of less than 2.5 μm

PM_{10}: Particulate Matter – fraction of particles having an aerodynamic diameter of less than 10 µm

PPP: Polluter-Pays Principle

PRTR: Pollutant Release and Transfer Register

REA: Resource Equivalency Analysis

R&D: Research and Development

SCR: Selective Catalytic Reduction

SEEA: System of Integrated Environmental-Economic Accounting

SEPA: Scottish Environment Protection Agency

SEP: Supplemental Environmental Projects

SME: Small and Medium Enterprises

SNCR: Selective Non-catalytic Reduction

SOE: State-Owned Enterprises

SOx: Sulphur Oxides

SO_2: Sulphur Dioxide

TEV: Total Economic Value

TSP: Total Suspended Particles

TWG: Technical Working Group

UNECE: United Nations Economic Commission for Europe

US: United States

USD: US Dollar

US EPA: United States Environmental Protection Agency

VEA: Value Equivalency Analysis

VOLY: Value of a Life Year

VSL: Value of Statistical Life

WFD: Water Framework Directive

WHO: World Health Organization

WTAC: Willingness-to-Accept Compensation

WTP: Willingness-to-Pay

Executive summary

Kazakhstan's impressive economic growth since its independence on the backbone of oil exploration, extensive mining and increasing industrialisation has led to **significant air pollution**. The main air pollutants of concern are particulate matter (PM), sulphur dioxides (SOx) and nitrogen oxides (NOx). SOx emissions per capita in 2014 were almost five times those of OECD Europe. More than half of Kazakhstani citizens have a low level of satisfaction with the air quality of their country. Power generation combined with district heating alone generate 40% of SO_2 emissions and 60% of NOx. This is due to an overreliance on low-quality coal, inadequate pollution control equipment and old generating infrastructure. This level of air pollutants is not sustainable, putting at risk the country's development ambitions. At the same time, new international agreements add urgency to the need to reduce greenhouse gas emissions. Furthermore, Kazakhstan has not yet acceded to any of the protocols of the Convention on Long-Range Transboundary Air Pollution, even though it has been a party since 2001.

Kazakhstan's regulation and system of environmental payments for industrial air pollutants **is not fit-for-purpose**.

- It is characteristic of a top-down and command-and-control approach to regulation – a legacy from the Soviet Union. It takes limited advantage of market-oriented instruments to incentivise companies to invest in pollution reduction and technology modernisation. It leads to discriminatory implementation of environmental requirements and a high volume of complex environmental regulations based on unrealistic assumptions.
- Promotion of compliance does not seem to be a priority. Limited information for, and assistance to, the regulated community are available. The overall concept of an enforcement pyramid is recognised, but not implemented. The understanding of how to instil a culture of dialogue with industry is missing. Informal and formal warnings, directions for corrective actions or administrative notices are not used. Risk-based monitoring is absent.
- State-of-the-art technical measures or best available techniques to prevent air emissions from industry are not embedded in the environmental permits.
- The Environmental Code introduced integrated permitting on a pilot basis, following benchmarks established with the European Union. At present, no resource user has used this provision.

The current system of environmental pollution payments for industrial operators is highly controversial. It is focused on **raising revenues** in particular from foreign-owned operators, rather than on creating incentives to reduce environmental impact. It encompasses three sets of distinct instruments, which all require urgent reforms. Pollution taxes (tax payments for authorised emissions) are based on each enterprise's emission limit values (ELV), calculated both for emissions within and above the ELV. Authorities may impose administrative penalties for pollution exceeding the ELV set in project documents and environmental permits. A judicial system enforces compensation (monetary damages) for environmental damage caused by emission into air. The value of the "pollution damage" is determined in most cases as a function of the pollution tax rates from each pollutant using

a mathematical formula – a so-called indirect method of calculating monetary damages (also known as "fault-based damages"). This system adds to the cost of investing and doing businesses. The fact that control and supervisory bodies are assessed by the number and value of penalties/fines imposed creates false incentives.

This report proposes several **changes to the framework regulating industrial air pollutants** (i.e. the Environmental Code and some legislative acts on environmental issues). Some are **technical and could be implemented in the short term**, particularly those related to pollution payments. Others are directed to **more mid-to-longer term reforms** requiring strong political support. Ultimately, they support convergence towards more modern systems of environmental regulations.

Recommendations for environmental payments for industrial air pollutants

Pollution taxes	Non-compliance penalties	Monetary compensation for damages
• Reduce discretionary powers and avoid any forms of discrimination. • Focus further the tax base on priority pollutants. • Progressively increase the tax rates/charges in line with abatement costs. • Carefully assess the option of setting up environmental funds. • Sustain efforts towards OECD acquis and analysis on AQS, quick-wins for upgrading of processes and BAT/ELVs.	• Fully use compliance assurance and approaches of an enforcement pyramid. • Reform the systems for penalties/fines (i.e. min-max amount per day, non-discriminatory model with a gravity component within the range). • Delink criminal liability from civil monetary damages. • Improve the effectiveness of penalties. • Adjust legislative acts, principles and tools for enforcement (i.e. principles of good regulation, risk assessment methodology, self-monitoring with third-party verification, ISO 14001 or EMAS EMS, and remote sensing/analytics).	• Eliminate any form of fault-based damages (i.e. liability arising from unauthorised emissions or exceeding a limit in an IEP), of discrimination and the indirect method of calculating damages. • Define further environmental damage (i.e. with substantive reference to damages to the services provided, evidences of actual harm and causal link, and absence of role of the ELVs). • Move towards equivalency analysis to assess damages (i.e. with complementary and compensatory remediation). • Reserve power to bring lawsuits in the public interest to state authorities. • Strengthen the requirements for operators to make financial provisions.
Areas for further reforms / implementation steps		
• Deepen the implementation planning with priority sector strategies to reduce pollution. • Communicate, co-operate and collaborate to build multi-level capacity for enforcement. • Enhance data availability and quality (in liaison with the OECD SEEA and GGI projects) for adequate monitoring and evaluation. • Enforce at ground level with adequate incentives. • Draw resource implications for better compliance, possibly with cost recovery charges. • Further the work on air pollution from mobile sources.		

Note: AQS = air quality standards; BAT/ELV = best available techniques/emission limit values; EMAS EMS = EMAS: EU Eco-Management and Audit Scheme Environmental Management System; IEP = Integrated Environmental Permit; SEEA = System of Integrated Environmental and Economic Accounting.

Well-implemented, these reforms will certainly help in **better aligning** environmental policies in the spirit of the Polluter-Pays Principle. Specifically, they will aid the transition from a punitive payments system to one based on results/rewards and recovering costs. Ultimately, this will support Kazakhstan's efforts to reach **Targets 3.9[1] and 11.6[2] of the 2030 Agenda for Sustainable Development**.

Notes

[1]"Substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water, and soil pollution and contamination."

[2]"Reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality, municipal and other waste management."

Chapter 1. What are the issues?

Kazakhstan's impressive expansion on the backbone of the extractive industry (oil and metals) relies on high rates of energy use, resulting in significant air pollution. In line with an ambitious aim to become one of the top global economies by 2050, much remains to be done to green the economy and converge towards OECD living standards. Further review of the regulatory framework regulating industrial emissions will be essential.

Building on OECD previous analysis, this chapter analyses the system of environmental regulation and assessment for industrial emissions. It underlines how the design and implementation of the economic instruments (the environmentally related taxes) are primarily focused on raising revenues. This is contrary to the intention of the Polluter-Pays Principle. The chapter then turns to how these instruments impede energy efficiency and pollution abatement with heavy-handed non-compliance responses. Drawing from air pollution regulations and environmentally related taxes in OECD member countries, the final section offers some suggestions for reforms, which are then treated in detail in the following chapters.

1.1. The overall cost of air pollution – the single greatest environmental health risk

Air pollution is "the world's largest single environmental health risk" (WHO, 2014[1]). It also a major risk factor in several diseases leading to disabilities and deaths (WHO, 2014[2]). As has been established in a series of scientific studies in the present decade, ambient air pollution – counting both ambient particular matter pollution and ambient ozone pollution – imposes a much greater toll in premature deaths than was previously estimated.[1]

It is therefore urgent to implement policies that reduce emissions of air pollutants and limit the population's exposure to air pollution. In 2015, outdoor air pollution prematurely killed close to 4.5 million people (Roy and Braathen, 2017[3]). By 2060, this figure could increase by a factor of two to three. The regions most affected will include those that are densely populated and have high concentrations of $PM_{2.5}$ and ozone, such as the People's Republic of China and India, as well as those with an ageing population. Global annual welfare costs associated with those premature deaths could increase from USD 5 trillion in 2015 to USD 18-25 trillion by 2060 (OECD, 2016[4]).

Theoretically, air pollution can affect economic output through four channels. First, it can affect the size of the working population (through deaths and migration). Second, it can reduce the amount of hours worked per worker, if they are sick and cannot work (or have to attend to a sick relative). Third, it can reduce workers' productivity, conditional on being at work. Fourth, it can affect workers' productivity through the quality of natural capital, which is an input into production; this is particularly the case in the agriculture sector.

Finding the right policy response is an increasing challenge, even more when public awareness is higher and citizens expect governments to act. In the European Union, for example, a recent opinion poll on the environment highlighted that air pollution is the issue of most concern for citizens after climate change (European Commission, 2018[5]). Expectations are thus soaring that effective action will be taken at all levels to reduce air pollution and protect citizens from its harmful effects. Reducing risks to human health from degraded air quality, then, is central for improving people's lives and well-being (Roy and Braathen, 2017[3]).

1.2. Why is it important to address air pollution in Kazakhstan?

Air pollutants contribute to the increase in the incidence rate of associated illnesses and ailments in Kazakhstan. Consequently, they lead to direct and indirect losses to the national economy, including necessary medical care expenses and productivity losses. According to estimates, air pollution results in up to 6 000 premature deaths per year (Kazakhstan, 2013[6]). In 2015, a study based on the medical examinations of the population around industrial complexes (i.e. Temirtau, Ust-Kamenogorsk, Aktau and Ekibastuz) noted an increase of diseases in circulatory, respiratory and digestive systems (Ibrayeva, Amanbekova and Turgunova, 2015[7]). More than half of Kazakhstani citizens have a low level of satisfaction with air quality as pointed out by focus group results of April 2017. This group was conducted as part of the drafting of Kazakhstan 2025 Strategy National Development Strategy (Ministry of National Economy of Kazakhstan, 2017[8]).

The highest emissions are of SO_2, total suspended particles (TSP) and NOx, which are formed in the process of power production and other human activities. They account for about 95% of the total emissions of harmful substances.[2] In addition to the main air pollutants of cities and small towns, there are more than 70 kinds of harmful substances, including ozone, formaldehyde, hydrogen fluoride, lead compounds, ammonia, phenol,

benzene, carbon disulphide and others. Stationary sources' emission trends as reported by the Ministry of Energy show some fluctuations for acidifying agent (SO_2, NO_2) but no clear increasing or downward trends (UNECE, 2019[9]). Emissions of non-methane volatile organic compounds doubled over 2011-16, while the hydrocarbon emissions were cut by more than half. SOx emissions per capita in 2014 were almost five times that of OECD Europe (OECD, 2019[10]).

Three sectors in Kazakhstan – the power industry with combustion sources, manufacturing and mining, and transport – account for the vast majority of Kazakhstan's emissions. In 2016, 40% of SO_2 emissions and 60% of NOx emissions from stationary sources in the country were caused by electrical power plants; most (45%) of these plants were powered by low quality coal and high ash content (UNECE, 2019[9]). Almost half of the generating infrastructure is older than 30 years and needs upgrading and modernisation (ADB, 2012[11]). Air pollution is a severe environmental problem in urban areas, especially in the industrial zones developed as production centres and located in industrialised oblasts. Air pollution in Almaty is one of the major environmental concerns. This is linked, among other sources, to the operation of three thermal power plants located in the city.[3]

Kazakhstan does not have a specific national air quality policy and legislation. Some policy directions for air quality are derived from other strategic documents, such as the 2013 Concept on Transition to Green Economy. Requirements for oblasts to develop and adopt policy documents to reduce air pollution do not exist, including for those with high levels of air pollution. This is contrary to the policy in most local jurisdictions in the OECD. In the latter, air (and water) quality standards are set first, and then emission limit values (ELV), or equivalent, are determined through permitting. This is be done in transitioning to best available techniques (BAT). However, it is also a result of setting environmental quality standards on the basis of levels of emissions that safeguard human and ecological "health". These standards are drawn from an Air Quality Strategy covering transboundary, national and regional/local levels. An overall strategy can be supported by local plans. These would inform the setting of permit-specific ELV, which are based on BAT-AEL (Associated Emission Levels), but adjusted for local circumstances.

Since 2001, Kazakhstan has been a party to the Convention on Long-Range Transboundary Air Pollution. However, it has not yet ratified any of the Protocols to the Convention. Notwithstanding, Kazakhstan has reported an Informative Inventory Report and submitted emissions data to the Centre on Emission Inventories and Projections in 2017, although not in an electronic version.

The rules for maintaining the state register of pollutant emissions, approved by the Ministry of Energy dated 10 June 2016 No. 241, establishes the list of substances reporting by the Pollutant Release and Transfer Register (PRTR). It contains information on the volume of both actual air emissions of pollutants for 60 substances and water emissions for 62 substances. Kazakhstan has not yet ratified the PRTR Protocol to the Aarhus Convention (the Kyiv Protocol), and is still forming a PRTR system. Therefore, there is no consolidated information in the context of all pollutants and all sectors of the national economy. Kazakhstan has not yet engaged in substantive co-operation with the OECD or considered adhering to the OECD Council Recommendation on PRTR (OECD, 2018[67]). The country does not yet refer to the OECD harmonised list of pollutants for PRTR.

In 2017, 778 nature users of category I provided PRTR reports; the 70th largest polluters have provided PRTR reports for two consecutive years. The PRTR system is a collection of scanned reports of different enterprises. This does not allow for real-time ranking of emissions by type (air, water, soil), by industry, and structurally is quite far from the

world's PRTR systems. Also, the ranking of emissions reports in the PRTR system of Kazakhstan is not available; information is presented only by region. And some enterprises in some regions are not represented in the PRTR system at all. For example, the system does not issue any reports for Pavlodar and Turkestan. The PRTR system is thus not ready to provide full information about country emissions. Moreover, the system is unable to display a transparent picture of emissions. It works in a pilot mode, which allows enterprises to provide information on the emissions of their choice.

There are no specific policy documents, strategies and related action plans on achieving high levels of compliance with environmental requirements and effective methods of assurance. The country has not established strategic goals for compliance assurance. The system focuses on counting activities (fines, revealed violations) rather than obtaining compliance results. The inspectors' work is still evaluated based on the fines and damage compensation claims imposed, rather than effectiveness of preventive and compliance promotion activities. With some exceptions, compliance promotion and dialogue with industry are not part of inspectors' work (UNECE, 2019[9]).

1.3. A very much command-and-control environmental regulatory framework

In 2017, OECD analysis highlighted how the structure of Kazakhstan's system of environmental regulation, permitting and payments impedes faster progress in improving energy efficiency and pollution control. The present report has found the country still has a "top-down" and "command-and-control" approach to regulations. Implementation of environmental requirements is still uncoordinated and discriminatory. And the high volume of complex environmental regulations is still based on unrealistic assumptions. The emphasis on environmental pollution payments as a means of raising revenue rather than on creating incentives to reduce environmental impact efficiently has limited environmental benefit. At the same time, this policy adds to the cost of investing and doing business in Kazakhstan.

More sophisticated drivers in the implementation of environmental regulations than just pollution taxes are quite uncommon in Kazakhstan. The following drivers should be considered:

- Good corporate governance based on senior management willing and able to maintain constructive multi-level relationships with all direct stakeholders (government, competent authorities, banks, customers and counterparties, co-investors/partners, banks and employees/potential employees) and indirect stakeholders (press, non-governmental organisations, public, third party shareholders/pension funds, compliance sustainability departments, other competent authorities/regulators).
- Foresight and awareness of the need to achieve social licence[4] to operate, as future access to natural resources, in any country, and finance, from equity investors and banks, will continue to depend on current practices and environmental performance.
- Technology, technical and knowledge-based ambition to select and adopt best available techniques. These would achieve a high general level of protection of the environment as a whole, at a minimum cost.

- Regulatory and public scrutiny during permitting on the proposed pollution-control technology in approval documentation. This would be coupled with the inability to get approvals for pollution-causing projects.
- High direct and indirect consequences of pollution incidents, well beyond administrative and criminal penalties. Adverse impacts would generate bad publicity together with serious monetary consequences. These could include suspension of operations for long periods, and/or the withdrawal of equity investments and loans.
- Pressure from local community stakeholders with the increasing tendency to take action that forces operations to abate pollution. This would use a variety of means, including limiting access to routes and organising protests around the facilities/installations/plants. These actions would be compounded by the intensive use of social media to publicise pollution incidents.
- Pressure from lenders and foreign investors, who are increasingly adding environmental and social covenants in funding agreements, up to refraining from funding projects and operations with poor environmental governance. Also, there is increasing scrutiny of companies listed on stock exchanges to meet the environmental, social and governance filtering criteria ("best in class", "best effort" or "norm-based screening"), underpinning environmentally responsible investment strategies.

The basic instrument for pollution control for stationary sources is a system of environmental ambient quality standards (EQS). These are expressed through Maximum allowable concentrations (MAC), which are theoretically the determinant factor in setting ELV in permits for individual installations. Resource-users can legally emit pollutants into the environment as long as they hold such environmental permits. Competent authorities at the national and regional level issue permits depending on the size of the operation. Environmentally related taxes are levied based on emissions within and above the emission limit value. The three types of payments comprise taxes for authorised emissions, non-compliance penalties and monetary pollution damages (which are detailed hereafter). These environmentally related taxes (ERT) are common in Eastern Europe, Caucasus and Central Asia (EECCA) countries. However, they are unknown in most OECD members, except for several countries that were previously part of the Soviet Union.

1.4. Environmentally related taxes for industrial air pollutants: Focusing on raising revenues

1.4.1. ERT are now below OECD comparators

In Kazakhstan, ERT have fallen under the OECD and OECD average. This is mainly due to a sharp decline of taxes of useful minerals of oil sector companies, including penalties/damages. This assessment does include the tax on the production of minerals of the oil and non-oil sector, in line with the OECD approach to establish ERT, as defined by the PINE database (OECD, 2019[12]). This approach might differ from the data provided by the Committee on Statistics on budget revenues and expenditures on environmental measures. These tend to focus on revenues allocated to environmental measures nationally and in the regions.

Table 1.1. Evolution of environmentally related taxes in Kazakhstan

(Unit: tenge, millions)

Tax revenue line	As in the tax revenue submitted to the OECD	2012	2013	2014	2015	2016	CAGR12-16	Percentage (12-16)
Excise tax on petroleum products	5 121 excises on petroleum products	22,599	24,139	25,221	26,216	42,042	16.8%	2.7%
Tax on production of useful minerals of oil sector companies (incl. penalties/damages)	Tax on production of useful minerals of oil sector companies to National Fund	1,019,253	918,117	956,090	459,942	278,597	-27.7%	70.9%
Excise tax on automobiles	5 121 excises on automobiles	3 351	4 208	4 352	931	...	-100.0%	0.3%
Recurrent taxes on motor vehicles	5 210 recurrent taxes on use of goods and perform activities	30 961	36 029	38 844	42 278	46 879	10.9%	3.8%
Emissions into the environment	Emissions into the environment	67 183	93 179	97 712	63 379	67 216	0.0%	7.6%
Tax on placement of outdoor advertisements	Placement of outdoor advertisements	5 016	5 652	5 981	6 076	5 855	3.9%	0.6%
Tax on production of useful minerals of non-oil sector companies (incl. penalties/damages)	Tax on production of useful minerals of non-oil sector companies	159 313	168 186	122 909	118 073	159 276	0.0%	14.2%
Subtotal ERT		1 307 676	1 249 510	1 251 109	716 895	599 865	-17.7%	100%
GDP (current)		31 015 187	35 999 025	39 675 833	40 884 134	46 971 150	-	-
ERT percentage of GDP		**4.22%**	**3.47%**	**3.15%**	**1.75%**	**1.28%**	**-**	**-**
OECD average		1.59%	1.62%	1.61%	1.63%	1.63%	-	-
OECD Europe average		2.51%	2.54%	2.50%	2.47%	2.47%	-	-

Note: Not available; -: Not applicable. CAGR is the compound annual growth rate.
Source: OECD calculations based on the OECD environmentally related tax revenue in OECD.Stat (OECD, 2019[13]) derived from the dataset from the Ministry of Finance on "Details of Tax Revenue – Kazakhstan" (OECD, 2018[14]).

The share of the tax on production of useful minerals of oil sector companies (including penalties/damages) is above 70%. This is unusually high, although it has been decreasing every year by almost 28%. In OECD Europe, for instance, the main environmental revenues are not linked to pollution charges (emissions into the environment), penalties or damages but are due instead to excise tax on fuel.

1.4.2. However, their design for industrial air pollutants is complex and diverges from OECD/EU acquis

Despite recent reforms brought about by the Environmental Code, environmental, pollution is still managed through regulations that include traditional post-Soviet mechanisms. Kazakhstan rarely uses more modern systems derived from OECD countries' experiences.

EQS/MAC

Environmental ambient quality standards (EQS) underpin the regulation of pollution. These are expressed through maximum allowable concentration (MAC). MACs are binding limits for all users of a given environmental medium, such as air.

The MAC system is overly ambitious. It theoretically mandates low ambient concentrations of pollutants derived from the concept of zero risk to humans and the environment during the worst possible circumstances (e.g. worst-case meteorological conditions; most vulnerable part of population) (OECD, 2017[15]). However, most MACs were established before 1990 and the lists of ambient quality parameters have not been revised or harmonised with international standards since then. The MAC values are set for 683 pollutants. Every pollutant has a defined hazard class (from 1 to 4, with class 1 the most hazardous). Air quality standards are based on short-term maximum and daily mean values. However, effective monitoring capacity, in both public authorities and industry, falls well short of the ambition that the MAC lists indicate. The number of parameters that is actually monitored is rather small.

The system of EQS/MAC, however ambitious its parameters, is not fully effective and does not provide a realistic evaluation of air quality in the country. The comparison with, for example, EU standards gives a more understandable picture with respect to air pollution levels. Air quality measurement results (measured concentrations of air pollutants in 2010-12) show that, in a number of stations, the annual mean and monthly mean values for PM_{10} and NO_2 are exceeding EU standards by (in some cases) a factor of two to three (World Bank, 2013[16]). There is thus widespread recognition of the need to reform the MAC system.

ELV

Resource users can legally emit pollutants into the environment as long as they hold an environmental permit that sets the ELV. Competent authorities at the national and regional level issue permits depending on the size of the operation. The permits, and the ELV contained within them, aim to ensure the quality of the environment at the surrounding residential area or at the boundary of the "sanitary zone" meets the hygienic requirements for air or water quality. This assessment considers the background pollution level.

Theoretically, ELV are set at levels to ensure the aggregate amount of emissions from all sources of pollution together with the level of pollution do not cause pollution levels in a given location to exceed the MAC. The calculation of ELV for individual enterprises in a given region, or oblast, involves computer-based simulations of pollutants' dispersion in the space.

In practice, there are a number of problems with the manner in which ELV are determined during the permitting process.

- The ELV in the permitting process are based on the level of historic pollution and background concentrations rather than emission limits that an industry could achieve when applying BAT.
- KAZ's industrial facilities typically obtain ELV based on the highest level of emissions measured during the maximum production output. This might facilitate compliance as enterprises often operate at a lower capacity without investing in processes, technologies and techniques.

- The ELV should only be set for pollutants for which the establishment of ELV is mandatory. However, many environmental permit applications include ELV for all identified emissions regardless of their quantities and potential hazard. This occurs because of a lack of information about the mandatory list of pollutants for emission limits. This, in turn, results in redundant paperwork both for responsible environmental specialists at industrial facilities and environmental regulators. Moreover, it does not provide environmental/health benefits for industrial facilities and environmental regulators. It also leads to insufficient focus on pollutants that cause most health impacts.

The ELV significantly exceed European benchmarks for the main industrial emitters such as the heat and power industry, which are following Kazakhstan Technical Emission Standards.

- SO_2 ELV (2 000-3 400 mg/m^3 for existing plants and 700-1 800 mg/m^3 for new plants in KAZ) are also much higher than those in the European Union (150-400 mg/m^3 under Directive 2010/75/EU) (European Commission, 2018[17]).
- Similarly, NOx ELV (500-1 050 mg/m^3 for existing plants and 300-640 mg/m^3 for new plants) are higher than in the European Union (150-300 mg/m^3).
- The range of PM ELV for coal-fired power plants is 600-1 600 mg/m^3 for existing plants and 100-500 mg/m^3 for new ones. Both exceed by several times the level established by the European Union of 10-20 mg/m^3.

Kazakhstan seems to be setting more stringent ELVs for new facilities, somewhat less stringent ones for existing plants after they have modernised and relaxed ones for existing plants before they modernise. However, existing facilities are not required to modernise to obtain their new permit. Therefore, existing industrial facilities can effectively continue to receive permits while operating with relaxed ELVs.

The Environmental Code also introduced integrated permitting on a pilot basis, following benchmarks established by EU Directive 2010/75/EU. However, as of early 2018, no application had been submitted for an integrated permit, in large part because there are no generally accepted BREF and the list of BAT published by the Ministry of Energy in 2014 is viewed by the operators as out-of-date and insufficient for this purpose.

In 2017, the OECD underlined an urgent need to optimise the permitting and compliance control requirements and to reform the establishment of ELV exclusively anchored in MAC (OECD, 2017[15]).

Environmentally related taxes for air polluting emissions from stationary sources

With respect to industrial air pollution, enterprises are subject to pollution taxes (tax payments for authorised emissions) for emissions below the ELV set in project documents and environmental permits.

The Tax Code specifies the tax rates per kilogram, per tonne or per GigaBecquerel. Pollution tax rates are set as coefficients multiplied by the monthly calculation index (MCI). For example, the rate per tonne of SOx emitted is ten times the MCI. The government establishes the MCI annually to consider inflation and other factors. The MCI is then used to determine taxes, as well as penalties and certain other payments.

Pollution tax rates for emissions within the ELV set in the permit are determined in a two-stage process. The Tax Code fixes the minimum or base tax rates, which apply for each of the 16 regional entities (14 oblasts and the cities of Almaty and Nur-Sultan).

A comprehensive reform of pollution charges in 2008 reduced significantly the number of pollutants subject to emission limits and emission payments. With the introduction of the new Tax Code, the list of air and water pollutants has been significantly reduced. To date, pollution charges are collected for 16 pollutants for emissions from stationary sources, for 13 pollutants for discharges into water bodies, and for eight pollutants from the combustion of associated and (or) natural gas in flares. There are also charges for pollutant emissions into the atmospheric air from mobile sources (gasoline, diesel fuel, gas and for disposal of production and consumption wastes.

Each oblast may then set a higher tax rate that does not exceed twice the base rate. Gas flaring by the oil and gas industry is an exception. Gas flaring was earlier subject to a locally imposed tax rates 20 times the base rate. This multiplier was eliminated in 2016, but tax rates on gas flaring (only) were correspondingly increased by a factor of twenty. Most Oblasts impose the highest possible rate of tax in each case.

Authorities impose administrative penalties when levels of emissions or discharges exceed the ELV set in project documents and environmental permits. Penalties can also be applied for the absence of an environmental permit, as examined in Chapter 3. A judicial system can enforce compensation (monetary damages) for environmental damage caused by emission into air. This is analysed in-depth in Chapter 4.

(OECD, 2017[15]) noted that ERT for air polluting industrial emissions are primarily used to raise revenue by excessively penalising non-compliance. It is also not clear whether environmentally related taxes collected at the local level are used effectively for improving environmental conditions and promoting a green economy. According to information provided by the government, only about 30% of revenues from environmental charges is spent on environmental protection measures (33% in 2016). This relatively low share would not have been questioned if environmental problems had been in check. However, evidence shows that environmental payments are used as a form of subsidy to address other problems, economic or social. Furthermore, no adequate resources are allocated to address pollution or reduce their impacts on human health or ecosystems (UNECE, 2019[9]).

1.4.3. The system is largely discretionary and discriminatory

The tax payments for authorised emissions are based on each enterprise's ELV, which leaves room for discretion. This is not in line with standard environmental tax principles, which require a charge per unit of emissions except in the face of clear evidence of threshold effects.

As of now, the system involves different treatment for specific industrial operators. Enforcement officials, for example, target locally owned operators more than international operators. The system sets rates for taxes and fines, which are not uniform for all industry sectors. Rates for small and medium-sized enterprises (SMEs), for example, are lower than for large enterprises (OECD, 2017[15]). Utilities and power plants are entitled to a reduction of emission tax rates by applying coefficients of 0.3 for air pollutants, 0.43 for wastewater and 0.05 for ash. There are different rates applied for emissions of pollutants coming from the flaring of associated and/or natural gas. Consequently, the oil and gas industry pay from 20 to 278 times more per unit of emission than the heating and power plant (Table 1.2).

Anecdotal evidence suggests possibilities to negotiate a "better deal" with environmental authorities at the oblast level. Such an arrangement could gain exemptions or other forms of rent seeking instead of designing solutions to prevent and control pollution.

Table 1.2. Tax rates per chemical from gas flaring and other sources

Tax rates per chemical	Rate per 1 tonne when emitted from gas flaring (A)	Rate per 1 tonne when emitted from all other stationary sources (B)	Times greater: (A)/(B)
Hydrocarbons	44.6	0.16	278 times greater
Carbon oxides	14.6	0.16	91 times greater
Methane	0.8	0.01	80 times greater
Sulphur dioxide	200	Not listed, but sulphur oxide is, at a rate of 10	20 times greater
Nitrogen dioxide	200	Not listed, but nitrogen oxide is, at a rate of 10	20 times greater
Soot	240	12	20 times greater
Hydrogen sulphide	1 240	62	20 times greater
Mercaptan	199 320	Not listed	Not applicable

Source: Author's calculation based on the MCI data provided by the Ministry of Energy.

The calculation of penalties for emissions above the established ELV for large businesses is also subject to interpretation and discrimination. There are two types of discrimination at play: by type of business entity (SME/large) and between sectors (oil and non-oil). Foreign investment projects, which are both large, and predominantly in oil and gas, are thus subject at once to multiple discriminatory factors.

Article 243 of the Administrative Offence Code[5] establishes how penalties are calculated on the volume over-limit emissions multiplied by a rate. Individuals entail a fine from 5 to 10 times the MCI. Officials, entrepreneurs, legal entities of SMEs are subject to fines from 20 to 50 times the MCI. Large enterprises are subject to a fine "in the amount of one thousand per cent rate for the emission in the environment for the exceeded amount of emissions". Authorities interpret this to mean that the penalty should be calculated not only by multiplying the rate times ten, but also by multiplying the product by the amount of the relevant emissions.

The method to impose a punishment thus differs by type of business entities. In the case of SMEs, the multiplier is the MCI. For large enterprises, the multiplier is the rate in the Tax Code for the relevant pollutant. Oil and gas also have a different rate for gas flaring. Unsurprisingly, the penalties imposed can vary from thousands of tenge to millions of US dollars for the same amount of pollutants (OECD, 2017[15]). This is not consistent with fair and equal punishment for the same damage or public danger.

Kazakhstan would be well-advised to reform this highly punitive system of Associated Petroleum Gas flaring payments in line with practices with OECD members. This recommendation was made in the OECD Multi-dimensional Country Review of Kazakhstan (OECD, 2017[15]). The issue is discussed in Chapter 3 of this report.

1.4.4. High administrative costs discourage abatement

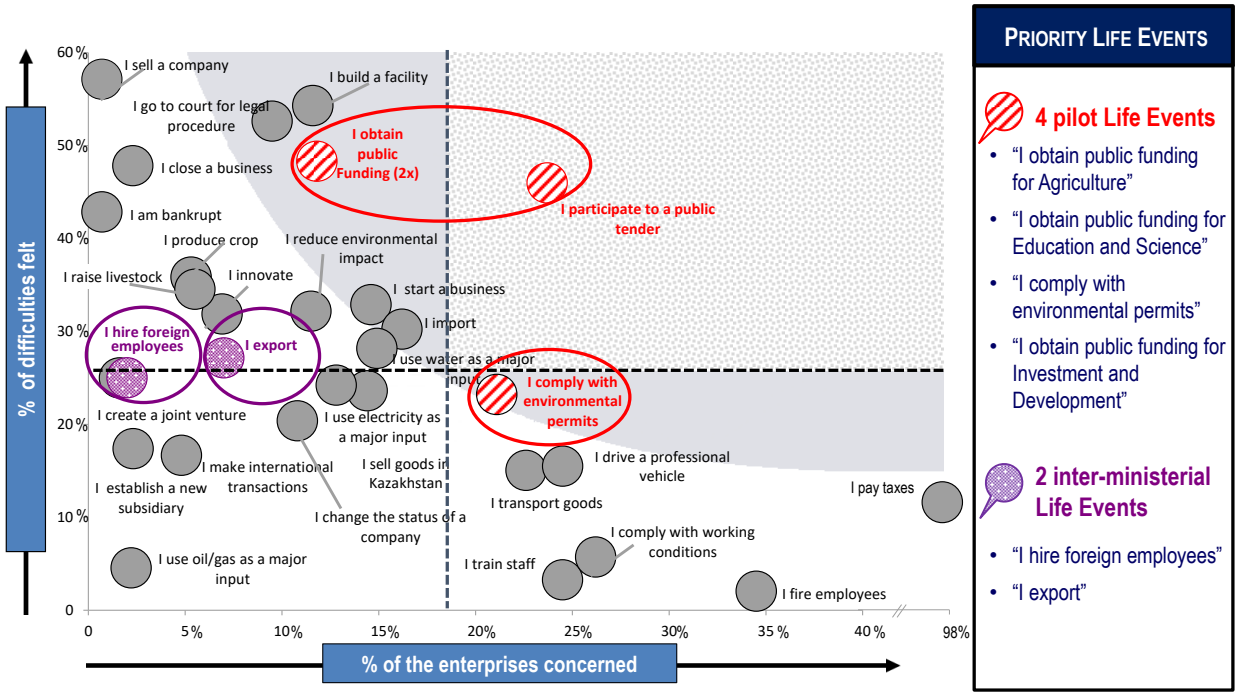
In 2014, the OECD defined life events as specific moments in the life of a typical business during which the business interacts with administration. This could include, for example, creating a business, participating in a public tender, or exporting goods and services. Four

pilot ministries were selected for further analysis. Businesses reported "complying with environmental permits" as the most difficult and frequent life event when dealing with the Ministry of Energy (see Figure 1.1).

Additional analyses used customer mapping. This tool analyses the process of tracking and describes all of customers' experiences with a government service. It identified seven issues when dealing with air emissions standards (see Figure 1.2).

Figure 1.1. Classification of life events by complexity and frequency

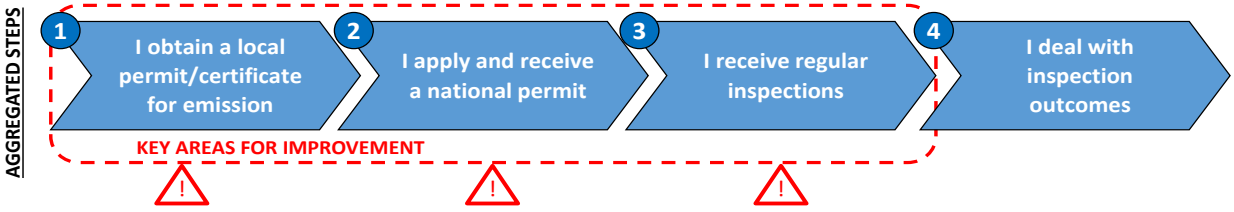
For four pilot ministries including the Ministry of Energy



Source: (OECD, 2016[18])

Figure 1.2. Example of customer journey mapping

Focused on "I comply with environmental permits" (first and foremost air emission permits).



MAIN ISSUES FACED BY BUSINESSES

Issues 1 Too many environmental standards		
Issues 2 Lack of information on standards and updates to the standards	Issues 4 Excess information being requested by the Ministry when applying for national permits	Issues 6 Low enforcement of inspection procedures
Issues 3 Lack of support from Akimat in preparing documents to apply for local certificates	Issues 5 Process delays by the Ministry when reviewing applications for national permits	Issues 7 Process delays during inspections

Source: (OECD, 2016[18]).

Interviews with environmental managers[6] suggested two findings. First, managers did not feel incentivised to implement or diffuse BAT. Second, they were not familiar with "cleaner production" or use of best available equipment or techniques.

Under the Code, a list of BAT for selected processes and industries was developed and approved (Order of the Ministry of Energy No. 155 of 28 November 2014 "On Approving the List of Best Available Techniques"). The Environmental Code (as amended) defined the requirements for the transition to technical specific emission standards. They are based on the introduction of BAT (Article 26)[7], which are established in technical regulations and the basis of integrated environmental permits.

However, most environmental activities are still focused on "end-of-pipe" solutions. The present BAT approved in the country are suboptimal. They are not fully consistent with the basic BAT concept, which is aimed at combining pollution prevention and control. The documents merely provided specific technical emission limits and reference methodologies for three industrial processes. These are largely insufficient, considering the variety of processes available in Kazakhstani industrial facilities.

The BAT were established without a fully representative multi-stakeholder platform. They are not linked to the permitting regulations; and industrial facilities are poorly informed about the approved list of BAT. Economic actors still perceive the move towards BAT as a risk. The International Green Technologies and Information Centre organised the first conference on BAT in Astana on 6 December 2018.[8] Before this conference, the government had not carried out awareness-raising campaigns on the benefits of the integrated environmental permit system and BAT. Nor had it created adequate incentives to stimulate economic actors to shift to BAT, such as supporting businesses to conduct a baseline assessment.

Box 1.1. The OECD Project on Enhancing Public Service Delivery for the Private Sector

The OECD Kazakhstan Regulations for Competitiveness Project aimed to enhance the country's competitiveness through better regulations and institutions. Within the framework of the project, the OECD Eurasia Competitiveness Programme and the government of Kazakhstan established six working groups to enhance public service delivery for the private sector in the country. With contributions from international experts and peer reviewers of selected OECD member countries, the project carried out data collection, analysis and consultations with stakeholders in Kazakhstan. In this way, they identified business priorities for enhancing private sector competitiveness, using the "Life Event Strategy" approach. This project recommended how Kazakhstan could further consolidate implementation of a Life Event Strategy.

The methodology of the survey underpinning the analysis was based on OECD member countries' good practice, especially that of France. The survey was carried out between November and December 2013. A representative sample of 1 000 foreign and local companies operating in Kazakhstan was chosen to participate in the telephone interview. The sample broadly reflected the general profile of companies in Kazakhstan by sector, size and regional location. The sample coverage included Almaty City, Astana City and all 14 regions (oblasts).

For each life event, the survey asked the following questions: has the user performed administrative procedures related to the life event in the last two to three years? If the user has experienced the life event recently: were the respective administrative procedures very simple, simple, rather complex or very complex? If the respective administrative procedures are stated by the user as rather complex or very complex: what constraints did the user encounter?

Thus, the specific objectives of the survey were to answer the following: which life events are most commonly experienced by enterprises? Which life events presented businesses with the most difficult administrative procedures? Do users' experiences of the most common life events, or life events that raise most administrative difficulties, vary (e.g. by region, sector or by size of company)?

Four pilot ministries were involved in the project:

1. the Ministry of Agriculture, in charge of reforming the life event "I obtain public funding/I participate in a public tender"
2. the Ministry of Education and Science, responsible for reforming the life event "I obtain public funding/I participate in a public tender"
3. the Ministry of Investments and Development, responsible for reforming the life event "I obtain public funding/I participate in a public tender"
4. the Ministry of Energy, responsible for reforming the life event "I comply with environmental permits".

Source: (OECD, 2016[18]).

Unsurprisingly, advanced abatement techniques are not installed in industrial facilities. Sufficient measures to reduce traffic emissions (e.g. cleaner fuels) are not implemented to achieve better and healthy air quality. State-of-the-art technical measures, such as those

described in EU Best Available Techniques Reference Documents, are not prescribed in environmental permits. In practice, the integrated permitting system based on BAT has not yet been widely adopted.

These findings reinforce the need to raise awareness and educate businesses as a key element of introducing reforms for permitting and supervision. The draft of the revised Environmental Code includes provision for a Strategic Environmental Action Plan and Regional Programmes (Art 47). Education and awareness raising should thus be priority objectives in the plan.

Moreover, basic regulation and technical requirements (similar to the EU BREF on environmental monitoring systems) is lacking, making it impossible to design compliant and cost-effective industrial monitoring solutions. In practice, companies must still monitor many more pollutants than the 16 subject to a pollution tax. Kazakhstan still has several lists of pollutants subject for mandatory control, including ones for mandatory setting of emission limits and ambient air quality standards (World Bank, 2013[16]).

Finally, at the level of the competent authority, technical understanding of the context for the issuance of the permit, the project and operations is insufficient. The impact assessment processes are far too focused on pollution payments. More attention is needed on proper detailed investigations to understand the unique setting of the operations and influence design of operations to minimise impacts. Under the system, an environmental action plan is part of the permit application. The formal implementation of its provisions is subject to strict control (e.g. scope of measures, status of implementation, actual financial requirements), with limited flexibility for adaptation. As long as the ELV are not exceeded, companies normally plan relatively small changes in operational and maintenance measures. In addition, there is no motivation for continuing environmental improvements and engaging with the competent authorities.

1.5. Air pollution regulations and environmentally related taxes in the OECD

1.5.1. The challenge of environmental fiscal reform, rationales and factors shaping the design of environmentally related taxes

There is a range of policy approaches to limit outdoor air pollution. In many countries, various economic instruments/market-based instruments complement "command-and-control" approaches using regulatory standards. Table 1.3 summarises selected examples of different policy approaches to address air pollution. In most OECD member countries, air pollution policy interventions have become increasingly integrated over the last 10-15 years, helping to increase cost efficiency. Examples include the US Clean Air Act, the Canada-US Air Quality Agreement, Clean Air for Europe and the National Environment Protection Measure for Ambient Air Quality (Australia). All of these acts of legislation have set standards for air quality, focusing on target-setting for a range of air pollutants from stationary sources. These overall frameworks include legislative programmes that target specific sectors, such as power generation, transport, industry and households. Non-OECD countries have fewer examples of cohesive programmes for controlling air pollution. Much of the focus is on specific policies for controlling emissions from transport, both through standards and economic instruments.

Table 1.3. Taxonomy of policy approaches for air pollution management

Regulatory (command and control) approaches	Economic instruments/MBI	Others
• Ambient air quality standards	• Tradable permits schemes for air emissions from stationary sources (e.g. SO_2 allowance trading system under the US Clean Air Act)	• Information collection: – emission and air quality monitoring – cost-benefit analyses to support policy evaluation (with valuation of health impacts) – public education (e.g. Canada's Air Quality Health Index)
• Industrial emission standards, BAT, technology standards	• Fuel taxes	• Voluntary car-scrapping schemes
• Reporting requirements for stationary sources (e.g. pollutant release and transfer registers)	• Congestion charges	• International conventions (e.g. The Convention on Long-range Transboundary Air Pollution)
• Automobile emission standards	• Taxes on emissions	• Telework initiatives (e.g. the US Telework Enhancement Act of 2010)
• Fuel quality standards	• Financial incentives for the development of alternative and renewable fuels and advanced transportation technologies (e.g. California's DRIVE programme)	
Vehicle inspection and maintenance programmes		

Source: (OECD, 2012[19]).

Information on a large number of economic instruments and voluntary approaches for air pollution can be found in the *OECD/EEA Database on Instruments* used for environmental policy.[9]

There is no single "right approach" when designing instruments to address air pollution, in particular for stationary sources. Solutions need to be found depending on the specific objectives and consider the economic, political and cultural context. However, several guidelines are considered in OECD member countries:

- Environmentally related taxes should provide an ongoing incentive to abate, improving the competitiveness of low-emission alternatives, and providing a strong incentive to innovate before raising revenues to use them in a socially productive way.
- Environmentally related taxes should thus be targeted to the pollutant or polluting behaviour, with few (if any exceptions).
- The tax base is targeted on the pollutant rather than on products serving as proxies.
- The scope of environmentally related taxes is ideally as broad as the scope of the environmental damage.
- The tax must be credible and its rate predictable to motivate environmental improvements.
- It has to balance desirability from an air pollution prevention and control point of view, and be technically and economically feasibility.

- Finally, MBI may need to be combined with other instruments to obtain the most efficient and effective policy package to address air pollution, but care should be taken to assess the impact of overlapping instruments.

1.5.2. Choosing between market-based instruments and regulations

In OECD member countries, environmental policy typically has been, and to a high degree still is, dominated by regulations as opposed to market-based instruments (MBIs). These regulatory approaches can be prescriptive and highly targeted. For example, they can ban or limit particular substances or require certain industries to use specific technologies. Over recent decades, interest has grown in MBIs such as taxes and tradable emission permits, in addition to or instead of regulations.

There are a number of reasons for the increasing use of ERTs. Taxes can directly address the market failure that causes markets to ignore environmental costs. A tax on any given item that accurately reflects the cost of its environmental damage obliges businesses and consumers to confront the true cost of their production or consumption choices. In other words, it "internalises" what had been an "externality". At the same time, it leaves businesses and consumers free to decide how best to adjust those choices. Thus, by drawing on all the relevant dispersed pools of knowledge while respecting individual preferences, it enables a reduction in environmental damage at least cost to society.

Most regulatory approaches involve the government specifying how to reduce emissions or who should do the reduction. Similarly, subsidies and incentives for environmentally preferable goods or practices could involve the government steering the economy in favour of certain environmental solutions over others. Both approaches could involve the government trying to "pick winners" – directing the market in a prescriptive way. This requires significant information about ever-changing conditions and technologies, and carries significant risk of making suboptimal choices. Regulations generally result in higher costs than taxes since they force particular types of abatement, even if cheaper alternatives are available (OECD, 2011[20]).

The higher cost of the polluting activity that results from the environmental tax makes the activity less attractive to consumers and businesses. In contrast to regulations or subsidies, however, a tax leaves consumers and businesses full flexibility to decide how to change their behaviour and reduce the harmful activity. This allows market forces to determine the least costly way to reduce environmental damage (OECD, 2011[20]). That said, market-based instruments work if the market performs as expected, but this is not always the case. A binary choice is thus not necessary; a mix of approaches can be used with state intervention as a backstop to fiscal measures. In some cases, financial instruments can have unintended consequences. For example, if a landfill tax is set too high, fly-tipping is likely to increase. It is good practice to model the sector/market in order to choose the appropriate mix of interventions. This is covered in a later section of the report.

1.5.3. Choosing among MBIs: Taxes/fees/charges, trading or tax incentives

Taxes increase the cost to a polluter of generating pollution, providing incentives for firms to develop new innovations and to adopt existing ones. For example, the increased demand for more fuel-efficient and alternatively powered processes induced by fossil fuel taxes provides an important incentive for machine makers to develop such a machine and for customers to buy them. Under regulation-based approaches, these incentives disappear once firms have complied with the regulated standard. Enhanced innovation lowers the cost

to society of addressing environmental challenges in the long run – adapted from (OECD, 2017[21]).

In OECD member countries (OECD, 2017[21]), emissions trading systems are different from taxes where tradable permits are allocated for free instead of auctioned. In those cases, no public revenue is raised. Since public revenue is scarce, auctioning of permits in principle is preferred. In addition, permit allocation rules can affect market entry and exit decisions in ways that slow down the reduction of pollution. This can occur, for example, in cases where incumbent, pollution-intensive firms receive disproportionate allocations of permits. Also, for trading to work well, markets need to be well-designed with a large number of trading parties, a set of conditions that is not straightforward to meet. These potential downsides of trading systems have to be weighed against the practice, and not the theory, of ERTs. It is not unusual for preferential tax rates to blunt the environmental effectiveness of ERTs. For an example, see the discussion in (Smith, 2008[22]).[10] In the case of Kazakhstan, the ETS is a first attempt. Given the limited competing parties in several sectors of the economy, it is still too early to decide if this instrument will be well adapted to the local context.

Like other subsidies, tax incentives have a number of important limitations. It is difficult to subsidise all potential environmentally beneficial alternatives to the harmful activity (some of which may not exist yet). Therefore, tax subsidies inevitably involve "picking winners", which may disadvantage other good alternatives.[11] Tax incentives are a form of spending public revenue, in contrast with taxes, which add to public revenue. This tends to favour the use of taxes, as government revenue usually is scarce. These limitations of tax incentives do not imply they should not ever be used. However, they do suggest caution, and should perhaps be used less frequently or designed more strictly.

Notes

[1] See pp. 9-10 (Roy and Braathen, 2017[3]).

[2] Based on data provided by the Ministry of Energy.

[3] CHP-1 (145 mW; 203 Gcal/hr); CHP-2 (510 mW; 176 Gcal/hr); CHP-3 (173 mW; 335 Gcal/hr). See Passport of asset: "Almaty electric power plants" https://sk.kz/local/ajax/download.php?id=866128.

[4] A social licence can be considered to exist when a project is seen as having the ongoing approval and broad acceptance of society to conduct its activities. See Prno and Slocombe (Prno and Slocombe, 2012[23]).

[5] See http://adilet.zan.kz/eng/docs/K010000155_.

[6] Mainly conducted by the World Bank (World Bank, 2013[16]), the OECD mining competitiveness project and through discussions with the Kazakhstan Association of Metal and Mining Companies.

[7] http://adilet.zan.kz/eng/docs/K070000212_.

[8] See http://lenta.inform.kz/kz/kazakhstan-intends-to-introduce-new-eco-regulation-regime_a3474581).

[9] See at www.oecd.org/env/policies/database.

[10] See (OECD, 2017[21]): "Emissions trading systems may perform better than taxes in cases where attaining a particular level of pollution is essential. This is because trading systems first define the level of pollution abatement (or the cap on pollution) and then use the permit-trading mechanism to allow reaching the cap in a cost-effective manner. The permit price will only become known once trading takes place. With taxes, the price of every unit of pollution is known in advance. However, it is uncertain exactly how much abatement will take place, as many factors other than the tax influence that outcome. Nevertheless, knowing the price of pollution helps investors make abatement decisions, so taxes can give stronger abatement incentives than emission-trading systems".

[11] See (OECD, 2017[21]), for example. A subsidy for low-emission vehicles does not provide any incentive for commuters to consider alternative forms of transportation, such as public transit or cycling. Also, it has been observed that tax incentives result in higher supply prices. For example, with inelastic labour supply, tax incentives for R&D can result in higher wages for R&D workers instead of, or in addition to, increased adoption of the intended behaviour.

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Chapter 2. How to charge taxes for air pollutants from stationary sources?

Kazakhstan's industrial operators are subject to pollution charges for their emissions below and above their relevant emission limit values (ELV). This is part of a quite unusual system of "paying to pollute", which originated before 1991. The pattern continues in various forms in the environmental regulatory framework of many other post-Soviet states.

Considering this command-and-control heritage, this chapter explores how Kazakhstan can incorporate elements of environmental policies from OECD member countries. Specifically, it asks what incentives can hasten the transition towards a scheme promoting the adoption of best available techniques to reduce pollution, in line with the Polluter-Pays Principle.

2.1. Introduction

As evidenced in (OECD, 2011[1]) and (OECD, 2017[2]), among other studies, environmentally related taxation is dominated by energy taxes, particularly those on fuels used in road transport. Quantitatively, the taxation of industrial air pollutants is a minor fraction of this sum. And it is largely the preserve of a small number of OECD member countries in Northern Europe (especially the Netherlands, Denmark, Sweden and Norway) or in Central Europe.

The rationale for their design is grounded in economic theory about how to "internalise" rather than "externalise" the true cost of environmental damage. In this theory, the government taxes a given item at a rate that reflects the costs of the environmental damage it has caused. This approach obliges business and consumers to confront the true cost to society of their production or consumption choices. A recent OECD report to the G7 Environment Ministers concluded that "to align taxes more closely with marginal external costs" is indeed "a pragmatic way forward" (OECD, 2017[2]).

From this relatively limited experience of OECD members in designing taxes on industrial air pollutants, two main theoretical types can identified:

- a tax rate aimed at a targeted reduction in emission levels of a given pollutant and set at or close to the estimated marginal cost of abatement required to reach that target
- a tax rate aimed at raising the relevant price to the corresponding marginal social cost, and set at or close to the outstanding marginal external cost: that is, the as-yet-unpriced marginal social cost of emissions of the given pollutant.

2.2. Comparative analysis

Pollution taxes in Kazakhstan for emissions within and above the ELV are the backbone of economic instruments and practices that are administratively heavy, inefficient and controversial (OECD, 2017[3]). Their main purpose is to raise revenues without any evidence of a relation to a marginal cost of abatement or to the corresponding marginal social cost.

At the origin, the system of pollution taxes relied on a formula reflecting the cost necessary to prevent and compensate for damages caused by emissions (discharges) of pollutants into the natural environment. Annex 1 provides an historical perspective on the evolution of the mechanism to collect payments for emissions. The aim to raise revenues was explicitly contained in the links with the national and regional environmental programmes and the plans to eliminate effects of environmental pollution. Over time and in practice, as noted by several analyses (UNECE, 2008[4]; OECD, 2017[3]; OECD, 2017[5]), the criteria for determining specific levels of pollution charges became obscure. Some enterprises have consistently complained about the lack of transparency of environmental regulations. They have expressed concerns that the taxes and fines were imposed to exert pressure and obtain additional funds (OECD, 2014[6]).

And Kazakhstan is not balancing the usage of pollution taxes with incentives that encourage companies to invest in techniques associated with reducing industrial air pollution.

In OECD member countries, the process for setting ELV is far more transparent than in Kazakhstan. Evidence is growing that the ELV in Kazakhstan might be too lenient,

particularly compared to the European Union's ELV for large combustion plants. In Kazakhstan, regulators have the excessive burden of discretionary power, while operators have opportunities to engage in strategic deception and regulatory capture.

As examined in OECD (2012[7]), the excessive emphasis on revenue raising continues to distort the functions of the individual monetary tools in the Eastern Europe, Caucasus and Central Asia region. In Kazakhstan, the practice erodes the government's credibility in implementing these instruments and undermines their environmental effectiveness. This report makes several recommendations to address these concerns:

- Taxes for emissions within and above the emission limits should be aimed at reducing releases of priority non-hazardous pollutants.
- Non-compliance payments/penalties and administrative response should be designed to prevent violations of environmental requirements by removing the economic benefit of non-compliance (see Chapter 2).
- Monetary pollution damages (or liabilities for environmental damage) should be focused on ensuring that the responsible parties finance the remediation of environmental damage they cause, using direct methods (see Chapter 3).

Box 2.1. The OECD Polluter-Pays Principle

The Recommendation on the Implementation of the Polluter-Pays Principle was adopted by the OECD Council on 14 November 1974. It specified the allocation "of costs of pollution prevention and control measures to encourage rational use of scarce environmental resources and to avoid distortions in international trade and investment." The polluter should bear the expense of carrying out the measures "decided by public authorities to ensure that the environment is in an acceptable state". It further elaborates the circumstances in which government assistance would be considered compatible with the principle. It also recommends conditions to the granting of government assistance in bearing the costs of pollution control through subsidies, tax advantages or other measures.

The principle did not feature in the 1972 Declaration of the United Nations Conference on the Human Environment in Stockholm. However, it was adopted as Principle 16 of the UN Declaration on Environment and Development in Rio in 1992. The European Community took up the OECD recommendation in its first Environmental Action Programme (1973-76). Its Recommendation of 3 March 1975 regarding cost allocation and action by public authorities on environmental matters also embraced the Polluter-Pays Principle. Since 1987, the principle has also been enshrined in the Treaty of the European Communities and in numerous national legislations worldwide.

Source: (OECD, 1974[8]); (European Commission, 2012[9])

Contrary to Kazakhstan's approach, all OECD members with environmentally related taxes (ERTs) for industrial air pollutants share an approach that attempts to design policies, laws and instruments that:

- follow the strict Polluter-Pays Principle for all (see Box 2.1);

- shift the focus of environmental requirements from "end-of-pipe" solutions to integrated pollution prevention and control;
- shift mentality of the largest and "high impact" polluters from command-and-control regulation, which just penalises non-compliance;
- re-incentivise compliance; and
- avoid undue overlap between policy instruments, as much as possible.

In practice, three main systems are in effect for some or all priority industrial air pollutants in OECD member countries. For each, OECD Europe member countries have a long-established regulatory framework of legislative administrative and judicial governance that can serve as a reliable guide.

2.2.1. The "pure" tax rate model

The tax rate is set as EUR/tonne and to incentivise abatement. It is linked to marginal abatement costs, which reflects the cost of one additional unit or tonne of pollution that is abated or not emitted. Because of the low cost of initial abatement, the heaviest polluting firms also tend to be the largest contributors to the reduction in pollution.

The tax base covers number of pollutants considered as significant (e.g. SOx, NOx total suspended particulates and heavy metals).

The collection rate is established following different methods:

- For the Swedish NOx emission tax and refund system (Box 2.2), the rate was based on an estimate of the marginal costs of abatement measures. These costs were expected to trigger an emission reduction of some 5 000-7 000 tonnes of NOx per year. This represents the amount necessary to reduce NOx emissions by 30% between 1980 and 1995.[1]
- For the Norwegian tax on NOx, the rate was derived from an estimate of the value of the damage caused by one kg of NOx emitted.
- For the NOx tax in New South Wales Australia (the Load-Based Licensing System), a comprehensive flexible model was used to better reflect the actual damage posed by the emissions. Variations were based on the amount emitted, where the emission occurred and the time of year.
- For other taxes on NOx emissions introduced in France, Italy and Galicia in Spain, the tax rates were quite modest in most cases and linked to the damages caused.
- Some OECD member countries, such as the United Kingdom, use models to allocate contribution to operators based on the "cost to serve". This will be subject to further discussion, as these models are best viewed as part of the cost regulation rather than as an ERT.

Box 2.2. The Swedish NOx Tax

The problem

Sweden was facing a serious soil acidification and water eutrophication problem caused partly by emissions of nitrogen oxides (NOx) from combustion processes in transport, industry and power.

The policy response

In 1992, Sweden introduced a high tax on NOx emissions from large combustion sources (e.g. power plants, industrial plants, waste incinerators). The tax was accompanied by a refund according to the amount of energy generated. This ensures that facilities with low NOx emission intensities are net beneficiaries of the scheme.

Continuous monitoring of emissions was also made mandatory. The tax was designed to accelerate and stimulate investment in advanced combustion and pollution-abatement technologies. It was also meant to supplement regulatory measures.

The impact

Within 20 months of implementing the tax, NOx emissions were reduced by 35%. Industry was encouraged to develop cheaper, more efficient technologies; emission intensities of energy production were cut by half.

The case of Sweden shows that a high emission tax rate can be made politically acceptable by: i) refunding revenues earned back to the firms affected; and ii) ensuring the policy is well designed.

Source: (OECD, 2013[10]).

2.2.2. The ELV/BAT model without payments for emissions within the limits

In the absence of payments for emissions within the limits set following an ELV model using best available techniques (ELV/BAT), the operator is not charged for emissions up to ELV. This might follow a recommendation (e.g. level in terms of mg/Nm3 for a specific industry/activity) and/or the BAT-AEL (e.g. in the EU-BREF of the European IPCC Bureau). The ELV is realistic and not based on zero human health impacts. Non-compliance payments may apply in case of emissions that exceed the limit. Most EU countries follow the Industrial Emissions Directive (see Box 2.3).

2.2.3. The ELV/BAT model with payments for emissions within the limits

In the case of countries in transition (mostly EU members), taxes for air emissions and water discharges are common. The taxes/payments are based on an ELV/BAT model for emissions up to the ELV. Other than that, there are no differences with the previous model. Non-compliance payments may apply for exceeding the limit for emissions. The base and rate are set based on ELV as part of the permitting process. The ELV follows a recommendation for a specific industry/activity (e.g. level in terms of mg/Nm3 as per the EU IED). For example, the Slovak Republic is one of the few OECD member countries still following this system for pollution taxes.

Box 2.3. The EU Industrial Emissions Directive

The European Union sets the overarching framework regulating the emissions of pollutants from the industrial facilities of its member states. Until recently, Directive 2008/1/EC concerning integrated pollution prevention and control (the "IPPC Directive") and a series of narrower sectoral directives established the conditions for granting environmental permits to about 52 000 regulated installations. Those multiple directives have since been replaced by a single one. Directive 2010/75/EC (the "Industrial Emissions Directive" or IED) aims to provide a more comprehensive framework regulating industrial emissions in the European Union. Under this framework, environmental permits must "take into account the whole environmental performance of the plant, covering e.g. emissions to air, water and land, generation of waste, use of raw materials, energy efficiency, noise, prevention of accidents, and restoration of the site upon closure" (European Commission, 2018[11]). Greenhouse gas emissions are, however, excluded from the scope of permits in cases where industrial facilities are already covered by the EU Emissions Trading System. This integrated approach to addressing industrial pollution – as opposed to separately controlling emissions into different environmental media – ensures that pollution is not shifted from one medium to another.

Under IED rules, environmental permits must include requirements reflecting the performance of the BAT. They must also identify corresponding emission limits for each pollutant concerned and the suitable emissions-monitoring methods. Emission limits should be set for each permit so the regulated facility meets the emission levels prescribed in the associated BAT conclusions. To arrive at these BAT conclusions, the European Commission has put in place an information-exchange forum (sector-specific technical working groups). The forum allows for member states and stakeholders, including non-governmental organisations and industry, to draw up industry-specific BAT reference documents (the "BREF" documents). BAT conclusions form part of these documents. These conclusions, in turn, lead to the setting of industry-specific and facility-specific permit conditions that cover BATs and the corresponding emission limits.

At present, BAT conclusions have been published for 14 industrial sectors. A further 18 sectors benefit from BREF elaborated under the IPPC legislation; these are being reviewed to create Implementing Decisions. Thus, there are 32 sectoral BREF, developed over 1997-2018.

Deviations ("derogations") from these standards are only permitted where local and technical characteristics would make their adoption disproportionately costly. As before, key parts of the necessary technical documents (the BAT conclusions) are to be adopted via implementing acts. These conclusions shall serve as a reference in the drawing up of permit conditions.

Source: (European Commission, 2018[11]).

2.3. Proposed recommendations

2.3.1. Reduce discretionary powers and avoid any forms of discrimination

Pollution tax/charge rates should be the same per unit of pollution, irrespective of the total load (so-called flat rates). Flat rates would help provide a continuous incentive for pollution

reduction even beyond compliance with the permitted limit as long as this is economically feasible.

This approach would increase the overall incentive impact of the tax/charge and limit administrative discretion in applying it. The flat rate would also remove any incentives to adjust ELV depending on the enterprises' tax burden (OECD, 2012[7]).

Against this backdrop, Kazakhstan should thus set rates for taxes for 1 tonne of emissions that are uniform for all sectors and, as much as possible, for all regions.

2.3.2. Further focus the tax base on priority pollutants

Regardless of its primary purpose, but especially if it is to reduce pollution releases, the pollution tax must be levied on a limited number of priority non-hazardous pollutants.

The number of pollutants subject to taxes should be reduced to a small number of priority air and water pollutants. Such pollutants should be based on international commitments or targeted air quality standards. An analysis of the main environmental problems in Kazakhstan that reflects an updated Green Economy Concept should guide the determination of pollutants that would continue to be charged.

To create an incentive, pollution taxes must be targeted at a few key pollutants that represent priorities of the government's environmental management programme. These pollutants must be emitted by a relatively small number of big stationary sources and can be measured at a reasonable cost.

- For example, for air pollution, taxes could target a reduction of SOx, NOx, particulates, and possibly some VOC emissions by the economic sectors contributing the largest share of the total emissions (and of the tax/charge revenue).
- In Western European countries where air emission taxes exist (Sweden, Denmark, Norway, Italy), taxes are focused mostly on SO_2 and NOx (OECD, 2012[7]).
- In the Czech Republic, for example, all stationary sources of emissions have been divided into two categories since 2012: i) sources and industries directly specified in the special Annex No. 2 to the Air Protection Act; and ii) all other sources. At the same time, only 4 pollutants in emissions instead of 20 are charged with a fee: PM_{10}, SO_2, NOx and VOC (volatile organic compounds).

The same approach could be applied for releases of pollutants into water. This could focus on a small number of pollutants, such as organic matter, suspended solids, phosphorus and nitrogen (OECD, 2012[7]).

The reduction of the number of taxable pollutants and liable installations would lower the administrative burden of controlling and enforcing pollution tax payments. This would, in turn, lead to improvements in the administrative efficiency of this instrument (OECD, 2012[7]).

There are several reasons why Kazakhstan may encounter resistance against the pollution tax base. First, the country has substantially reduced the number of pollutants subject to taxes/charges over the last ten years. Further reduction may meet strong political resistance because of the perceived effect on revenues. However, as noted earlier, key pollutants likely already account for close to 90% of the revenue. This "loss", therefore, will be heftily compensated by the increased tax rates on these pollutants.

Some may argue that reducing the pollution tax base would undermine the already weak system of industrial self-monitoring. In other words, enterprises would not report on pollutants other than those subject to the tax/charge. However, permit conditions regarding self-monitoring should be enforced irrespectively of the tax/charge liability. Moreover, the reporting of emissions or effluents for tax/charge assessment purposes is seldom based on actual monitoring and is simply inaccurate. This is quite difficult to control in such a complex system.

Given the evolving scientific understanding of air pollution and its impacts, Kazakhstan would be well advised to maintain, and to strengthen up to EU standards, a research and monitoring capacity concerning a larger range of pollutants. This should include a Pollutant Release and Transfer Register and/or a continuous emissions monitoring system. All lists of pollutants used for permitting and reporting purposes, as well as setting environmental payments, should also be combined in a unified national list of pollutants. This, in turn, should be harmonised with the list of pollutants in Annex II List of polluting substances (Air) of the Kyiv Protocol.

2.3.3. Progressively increase the tax rates/charges in line with abatement costs

Tax charges/fees in Kazakhstan are low compared to any marginal abatement costs and to rates in OECD member countries. Table 2.1 provides some data on the two most important pollutants in the country.

The few pollutants that will be covered by pollution rates/charges after the tax/charge base is reduced should be analysed. This process should determine typical tax burdens and pollution abatement costs for enterprises by sector and size. It should then estimate the degree to which the tax rates can be increased (as the number of pollutants subject to tax is drastically reduced). This estimate would enhance the incentive impact of the tax, while maintaining its economic feasibility and political acceptability. This analysis could not be undertaken as part of our joint project with Kazakhstan due to issues related to confidential and firm-specific data.

The economic feasibility here means that polluters (particularly in the public sector) should have financial resources to reduce their emissions in response to the tax.

Table 2.1. Selected cost per tonne emitted

	EUR/t	Comments
Nitrogen oxides		
Kazakhstan	59 (or 10 MCI)	
Czech Republic	30	Major stationary sources
	41	Air pollution fees
Slovak Republic	48	Air pollution charge – large and medium sources
Estonia	111	Air pollution charge
Poland	123	Based on 0.5300 PLN per kg
Italy	209	NOx pollution tax
France	161	NOx emitted to the atmosphere
Lithuania	196	Air pollution charge for stationary sources
Hungary	385	
Denmark	683	Duty on NOx
Norway	2 410	Tax on emissions of NOx
Sweden	5 280	Tax on NOx emissions
Sulphur oxides		
Kazakhstan	59 (or 10 MCI)	
Czech Republic	37	Major stationary sources
	50	Air pollution fees
Slovak Republic	64	Air pollution charge – large and medium sources
Lithuania	104	
Italy	106	SO_2 pollution tax
Estonia	112	Air pollution charge
Poland	123	
France	136	SOx emitted to the atmosphere
Hungary	161	
Denmark	1,570 - 3,130	Duty on sulphur
Norway	Varies	The rates differ according to the expected cost related to the handling of different applications.

Source: (OECD, 2019[12]).

If this condition is not met, some interim solutions are possible. These include a planned gradual increase of pollution tax rates along with management improvements in the sector.

Pollution tax rates should be increased gradually but announced early to soften the immediate cost effect on industry. Such an approach would give enterprises time to assess abatement costs versus paying the pollution taxes/charges and adjust their investment plans. Still, the high pollution tax rates will likely increase production costs and reduce competitiveness of polluting industry sectors. In the longer term, this may lead to structural changes towards greening the Kazakhstani economy.

Regardless of the incremental increase of the level at which pollution taxes are levied, they will most likely still seem low. The European Environmental Agency analysed that externalities in Europe from the emission of such pollutants are typically at least a factor of 10, and sometimes a factor of 100 or more. This is higher than the tax rates levied in Europe (see Table 2.2).

Table 2.2. Estimates of damage (EUR per tonne of emission) for NOx in 2010 and 2020

(2005 prices)

	NOx 2010		NOx 2020	
	Low VOLY	High VSL	Low VOLY	High VSL
Germany	13 924	38 145	15 209	41 426
Denmark	3 812	10 324	4 159	11 171
France	10 343	27 549	10 291	27 098
Italy	8 394	22 723	8 376	22 399
Norway	1 990	4 997	1 985	4 922
Slovak Republic	10 197	27 402	12 937	34 857

Note: This analysis follows the impact pathway methodology developed in the ExternE Project funded by European Commission's DG Research. The valuation of mortality is using the value of statistical life (VSL) and value of a life year (VOLY) approaches.
Source: (EEA, 2011[13]).

2.3.4. Carefully assess the option of setting up environmental funds

Revenues from ERTs, perhaps more often than from other taxes, are subject to multiple and specific claims on their use. This occurs particularly when instruments are newly introduced.

Some argue that earmarking can help create support for ERTs by increasing policy transparency. However, this can become counterproductive in the long term. As the need for flexibility in spending decisions rises and as ERTs become standard, they require the broadest possible support. The higher the revenues from ERTs, the stronger the need becomes to ensure whole-of-government support for them. Statements of policy intent on how to use revenues can be useful in the short term. They can help introduce ERTs, which avoids the risks associated with strong earmarking (OECD, 2017[2]).

There are few incidences of such funds in the OECD for industrial air pollutants. In 2008, Norway created a unique NOx fund that entities could pay into and avoid paying tax. The money collected was then used to fund projects to reduce NOx emissions (see Box 2.4). In 2004, the Netherlands established the Dutch Air Pollution Fund (Ministry of Housing, Spatial Planning and the Environment of the Netherlands, 2004[14]).[2]

These environmental funds have become quite substantial in some countries. In Poland and the Czech Republic, for example, annual budgets exceed USD 100 million for such funds. These generally derived revenues from environmental charges and taxes that were set aside ("earmarked") for environmental purposes rather than transferred to the general government budget. Funds used these revenues to provide financial assistance to the private or public sector, usually on favourable terms, for investments and other projects to achieve environmental objectives (OECD, 1995[15]).

During the transition to a market economy, a series of market, policy and institutional failures impede the emergence or effective use of financing mechanisms characteristic of market economies. The OECD highlighted several problems, including weak or ineffective enforcement of environmental policy; severe financial constraints on enterprises and households; uncertainties in fiscal systems; poorly developed banking systems and capital markets; and inadequate information concerning costs of environmental damage.

Environmental funds (or green funds) could provide an interim means of circumventing these problems. By supplying financial assistance, such funds could leverage resources from other sources, and thus speed the pace of environmental improvements.

Environmental funds could also help strengthen domestic capacities for project preparation and policy implementation. In conjunction with other policy instruments, funds could help develop and implement priority environmental activities in line with international commitments. This was underlined previously by the St. Petersburg Guidelines on Environmental Funds in the Transition to a Market Economy developed by the OECD (1995[15]).

Kazakhstan could consider earmarking environmental taxes and penalties for general environmental purposes. Without careful design and management, the potential advantages of green funds could become defects. From a fiscal policy perspective, "earmarking" has potential dangers: allocating and disbursing revenues outside the government budget may create long-term economic inefficiencies. Well-designed procedures and incentives are needed to ensure that environmental funds target priority environmental problems and spend revenues effectively. This requires effective project appraisal techniques, as well as sound financial and accounting processes, procedures and management capacities. Transparency on the funds' operations is paramount. They should be accountable to the government, parliament and the public for their actions. This is important to ensure continued support from finance ministries and ultimately public acceptance of environmentally related taxes.

With all this in mind, establishing such a vehicle in Kazakhstan could be considered to earmark environmental taxes and penalties for general environmental purposes. However, the inclusion of monetary compensation for damage from industrial air pollution would deviate from OECD standards. Monetary damages are used to pay for restoration or remediation of the specific environmental resource that the polluter has damaged. These damages are never dedicated to financing unrelated environmental remediation initiatives.

Box 2.4. The Norwegian NOx Fund

Norway developed a fund supported by the public and private sector for green innovations

Norway set an ambitious target to reduce NOx emissions by 20% versus the baseline. This decision followed ratification of the Gothenburg Protocol under the UN Economic Commission for Europe Convention on Long Range Transboundary Air Pollution. The Protocol also covers other pollutants like SO_2 and volatile organic compounds (VOC), but the Fund targeted NOx emissions. The rest of Norway's obligations could be met without additional tax or had been met by the moment Norway had ratified the Protocol. The industry wanted the same arrangement for greenhouse gases, but it turned out to not be possible due to the EU Emissions Trading System.

In 2007, a state NOx fee was set at NOK 15 per kg of NOx emitted (approximately EUR 2.2 per kg). The industry paid the tax in 2007. The government had identified selective catalytic reduction (SCR) and selective non-catalytic reduction (SNCR) as the main technologies for industry to meet the NOx reduction goal. After several negotiations with authorities, 14 non-governmental organisations and the Ministry of Climate and Environment signed an Environmental Agreement on NOx, which entered into force on 1 January 2008. A three-year transition period was negotiated, at the end of which the 20% reduction was to be achieved. Ultimately, the 861 participating companies had reduced NOx emissions by 28 000 of the 38 000 tonnes committed by Norway.

Fifteen co-operating business organisations co-founded with the government a NOx Fund for the private sector, which exempted them from the NOx tax. Land-based industries could contribute EUR 0.5 per kg of NOx emitted to the Fund, while the oil and gas industry could pay EUR 1.3 per kg to the Fund. The members of NOx Fund achieved 74% of the emissions reduction target, while the industry as a whole was responsible for 32% of NOx emissions.

The Fund committed to support more than 1 000 applications from businesses to reduce NOx emissions. The government initially planned for most of these measures to result from end-of-pipe measures for cleaning exhaust gases. However, the reality was somewhat different. Only 20% of the emission reductions – as supported by the NOx Fund – resulted from implementation of SCR or SNCR. Most measures related to fuel switch, better combustion techniques and process optimisation, shift to modern burners, etc.

The Fund quickly became a success and accelerated efforts to cut NOx emissions. At the same time, it gave the industry financial support to implement competitive green technologies. It also became an important driving force for the strengthening of the government's environmental functions. Instead of importing equipment, the Fund helped optimise projects with support from local consultants and engineers.

The NOx Fund thus became an important stakeholder for Norwegian policy makers. Two continuations of the Environmental Agreement were signed for the 2011-17 and 2018-25 periods. In its current incarnation, the Fund is giving more attention to the shipping industry.

Ultimately, through the Fund, companies met compliance requirements at a much lower cost than EUR 2.2 per kilo.

Source: Author's elaboration based on interviews and desk research.

2.3.5. Sustain efforts towards OECD/EU acquis and analysis on AQS, BAT/ELV and IEP

Air quality standards

Kazakhstan should initiate a stepwise process to accede to the three amended protocols to the Convention: the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone, the Protocol on Heavy Metals and the Protocol on Persistent Organic Pollutants. Since 2001, Kazakhstan has been party to the Convention on Long-Range Transboundary Air Pollution. However, it did not become a party to important protocols under the Convention, such as the amended Protocol to Abate Acidification, Eutrophication and Ground-level Ozone, amended Protocol on Heavy Metals and amended Protocol on Persistent Organic Pollutants (UNECE, 2019[16]). Kazakhstan started submitting emissions inventories to the European Monitoring and Evaluation Programme Centre on Emission Inventories and Projections (EMEP CIP). Accession to the EMEP Protocol would provide a good basis for quick accession to the other key protocols of the Convention. This would also give further access to the expert network under the Convention, which can help in providing guidance on ELV based on BAT. The Convention is increasingly providing expertise and guidance to the Eastern European, Caucasus and Central Asian countries. It aims to help them ratify and implement the key protocols and reduce air pollution (UNECE, 2019[16]).

Kazakhstan should draw up a roadmap to transfer the air quality assessment to air quality standards based on pollutant concentrations according to internationally accepted practices as outlined in Table 2.3 (European Commission, 2008[17]).

Table 2.3. Overview of AQS in Europe

Air quality standards (µg/m³)	PM_{10} annual	$PM_{2.5}$ annual	NO_2 annual	NO_2 hourly
European Union	40	25	40	200 (less 18 hrs a year)
People's Republic of China	70	35	40	200
Japan	-	15	-	(Only daily: 80-120)
United States	-	12	100	200
World Health Organization	20	10	40	200

Source: (European Commission, 2004[18]); (European Commission, 2008[17]); (US EPA, 2018[19]); (Ministry of Ecology and Environment of China, 2018[20]); (Ministry of Environment of Japan, 2018[21]); (WHO, 2006[22]).

Kazakhstan should also strengthen the national legislation to address air protection. At the same time, such legislation should help oblasts and other local authorities to draw up air quality plans and programmes to reduce and prevent the exceeding of air quality standards. For example, in the Czech Republic, public health targets are set in legislation. They chiefly limit values (especially for dangerous pollutants), build on annual health and environment surveys, and continue to establish objectives and targets for public health and the environment. Additional targets on air quality are included in the National Emission Reduction Programme. Moreover, reducing environmental and occupational health risks is a priority of the 2014 National Strategy for Health Protection and Promotion and Disease Prevention (OECD, 2018[23]).

"Quick-wins" for process improvements, before the adoption of a BAT-model

This sub-section examines how countries can improve processes in the most polluting sectors (i.e. power generation), even before the adoption of a BAT-model. Several OECD member countries, including Norway (Box 2.5) have shown that these "quick-wins" are well-known, proven and economically affordable.

The quick-wins harness a range of technologies. Transferring a boiler from fuel to gas, for example, can reduce NOx emissions by 50-75%. Using non-catalytic purification with ammonia reduces NOx emissions in the range of 60-80%. Investments in new cleaning technologies, or processes (e.g. conversion of a boiler to gas) or replacement of equipment (e.g. a burner) have reduced NOx emissions by 60%, 80% and 91%, respectively. These generate a pay-back of 6.5, 5.2 and 20 years, respectively. Box 2.5 provides more details, on the basis of a NOx charge of EUR 1.9 per kg of emissions.

Results from the use of these technologies show that operators have an economic incentive to engage in cleaner production techniques, processes or equipment. In Norway, the tax rate for NOx is more than 30 times higher than in Kazakhstan.[3] In most cases, the benefits from reduced charges for emissions provide a foundation to recover investments in less than ten years.

Box 2.5. NOx reduction techniques and investments in Norway

The following list indicates the range of NOx emission reductions generated by specific technologies.

1) using catalytic purification with a catalyst (SCR) and non-catalytic purification with ammonia (SNCR): 60-80%

2) transferring the boiler from fuel oil to gas: 50-75%

3) improving the regulation of combustion processes; regulation of air supply/O2: 10-40%

4) lowering combustion temperature: 20-30%

Investments in new equipment have generated 60-91% NOx emissions reductions.

Table 2.4. NOx emission reductions and pay-back for three types of investment

	Unit	Cleaning plant based on non-catalytic cleaning technology	Conversion of the boiler to gas in a titanium plant	Burner replacement (low NOx burner)
Amount of the investment	Euros	1 000 000	1 300 000	2 300 000
Baseline emissions	in tonnes	135	163	67
Emissions reduction	in tonnes	81	131	61
	In percentage	60	80	91
Savings achieved	Euros	153 947	248 216	115 530
Investment ratio	Per kg baseline	7.4	8.0	34.3
	Per kg reduced	12.3	10.0	37.8
Pay-back		6.5 years	5.2 years	20 years

Note: calculated on the basis of a NOx charge in Norway of EUR 1.9/kg.
Source: interviews with Norsk Energi – The Norwegian Association of Energy Users and Suppliers.

2.3.6. BAT/ELV

Scope and benefits of BAT

Recent activities have promoted the BAT concept in Kazakhstan. However, the country still does not commonly apply BAT when setting up air emission limits and monitoring environmental management of industrial facilities. Investing in BAT would support efforts to modernise the industrial and energy footprint. Ultimately, this would improve domestic industrial competitiveness and access to export markets. Three key actions are needed. First, filters should be retrofitted and installed at plants and industrial enterprises close to big cities. Second, Kazakhstan should further consider switching coal-fired power plants to gas, if gas infrastructure and volumes are available and if it is cost- effective. Third, retrofitting large boilers at coal power plants, with modern control technology for PM, SOx and NOx, could allow smaller units to operate until decommissioning. This would require more technical feasibility studies, but could help satisfy demand for electricity.

In OECD/EU countries, BAT are mandatory for large polluters. Although the recommended techniques and technologies are voluntary, the ELV based on BAT are legally binding. There are often thresholds e.g. combustion of fuels in installations with a total rated thermal input of 50 MW or more. BAT focus on best techniques, not just best technologies. In other words, they also refer to the way in which the installation is designed, built, maintained, operated and decommissioned.

For larger polluters, integrated permits are increasingly favoured for all media in OECD members. However, BAT can still be used as an instrument in the absence of IEP. In Israel, for example, permit conditions are still based on BAT-AEL from the EU BREF. While IEPs are suitable for higher risk, complex processes, a range of permits should be made available to reflect circumstances. The United Kingdom, for example, has four main types of permit to reflect the level of environmental risk: bespoke, standard, registrations and exemptions. These four types could be seen as reflecting the four categories of operator set out in the Environmental Code (high risk, some risk, minimal risk and no risk). Permitting all operators provides a reference point with which to locate and investigate the operator, in the event of an environmental incident.

In the OECD, the ELV are set at a reliable, practicable and enforceable level. They are not based on zero human health impacts, on the level of historic pollution and background concentrations or on the highest level of emissions measured during the maximum production output. Rather, the ELV are set to ensure that, under normal operating conditions, emissions do not exceed levels associated with BAT. The ELV are expressed in terms of mg/Nm^3 as per the EU IED for a specific industry/activity and as an average over a given period.

During the application for a permit, the competent authority may ask the applicant to fill in a detailed spreadsheet. It refers to the BAT, explains any deviations and provides a detailed action plan to bridge the gap. The United Kingdom and Ireland have developed good practices to disclose permit information to the public. Permit decision documents are placed on the UK public register, to enable this transparency.

Some regions set emissions levels stricter than the BAT, depending on some regional environment priorities (e.g. in Germany).

Derogation in OECD members

The competent authority may as "a derogation" and "in specific cases" set less strict ELV. In the European Union, it must be shown that implementing the BREF levels would lead to disproportionately higher costs compared to the environmental benefits. These higher costs would be due to the geographical location or the environmental conditions of the installations concerned or their technical characteristics.

The derogation procedure may involve the public, including NGOs. The specific reasons (justification as well as conditions imposed) are made publicly available, including via the Internet. There is significant oversight for derogation. In the European Union, member states have to report all derogations granted to the European Commission. Further details on derogations are available on the EU collaborative platform CIRCABC.[4] For example, according to article 15(4) of the IED, regardless of any derogation the competent authority must still ensure that no significant pollution is caused and that a high level of protection of the environment as a whole is achieved.

Specific BAT for large combustion plants (LCPs) have been developed.[5] These offer certain flexibility instruments (e.g. Transitional National Plan, limited lifetime derogation). There is a possibility to apply less strict ELV for plants that operate for less than 1 500 hours per year.

The competent authority can grant temporary derogations from ELV associated with BAT to test emerging techniques in certain cases.[6] In the first case, the techniques may provide for a higher general level of environmental protection, or at least the same level of environmental protection as the BAT. Second, they might provide higher cost savings than the BAT.

For small and medium-sized enterprises (SMEs), environmental issues could be included in other permits. In Germany, for example, they are included in construction permits. In the Netherlands, they are included through General Binding Rules.

Process followed

Official reference documents for BAT or similar concepts result from data exchanges through sector-specific technical working groups (TWGs).

These groups convene different sets of public and private stakeholders to ensure a deep understanding of each party's requirements and expectations.

The participants first identify some techniques as candidate BAT, considering their environmental, technical and economic aspects. Further, they derive the BAT-AEL from the BAT. A separate body considers and approves the BREF developed by the TWG.

Participants tend to include governmental experts, industry representatives, NGOs, and public and private research institutes. Representatives of ministries other than energy or environment (e.g. economy) or experts appointed by a ministry, a business association, an operator or a specific academic institute, might help gather information on techniques. Increasingly, technology service providers are invited to apply for a position on TWGs or at the BAT forum (Article 13 Forum in the case of the IED).[7]

Preserving the transparency and diversity of the stakeholders is essential. This is especially the case in regard to the decision-making process to set BAT-AEL or the selection of experts mandated by ministries or academia. Their level of independence should be

carefully guaranteed, with the disclosure of possible conflicts of interest (e.g. grants awarded in the past from private entities).

Recent OECD work[8] on BAT suggests several areas to strengthen the BAT concept. These include, for example, considering value chain aspects when determining BAT. Another area is more stringent emission limits. These need to embrace global best-in-class techniques, moving beyond benchmarking restricted to a specific, geographic, legally binding scope. Strengthening BAT could also involve outlining the restrictive interpretation given in some eventual confidentiality claims that prevent the data exchange that establish BAT. In addition, the process of establishing BAT and BAT-AEL could be more transparent and standardised. Finally, it would be useful to increase access to information on techniques considered, permitting information and monitoring data.

Awareness development and communication

Some countries have invested in various approaches to create awareness among operators such as role-playing schemes (business games) and science challenges. The United States, for example, has created awards for green chemistry to promote the prevention of pollution through green approaches instead of focusing mainly on end-of-pipe responses. These countries also have well-staffed BAT centres. They provide experts on the technologies, on the process to establish BAT and on the monitoring of their implementation. The European IPPC Bureau or the Unit for Integrated Treatment of Industry at the Ministry of Environment in Israel are two examples that the IGTIC in Kazakhstan aims to emulate. These centres can also provide technical support to operators, in particular to establish the baseline.

The use of BAT is also often combined with practical advice on implementation. This is particularly needed on issues surrounding baseline, and takes the form of baseline reports in the European Union.[9] The IMPEL Network also provides guidelines on how to implement derogations under various EU member states. The "Do the right things" documents by the EU guide inspectors in planning and executing inspection programmes.[10]

A communication platform[11] is often developed and entails the following elements: i) an information portal building on the example of the European Union[12], as well as the main IED bodies[13]; and ii) a "Frequently Asked Questions" (FAQ), which could also draw from the experience again of the European Union.[14] An archived page of FAQs on the IPPC Directive is mostly still relevant.[15]

Implementation period

There are several ways OECD members have managed the transition to BAT. An inventory plan of the main installations was prepared covering three-quarters of emissions. Responsible government agencies conducted BAT compliance review of industries and assessed the level of preparedness, and considered feedback from industry. In Norway, for example, the Ministry of Environment and the Environment Protection Agency acted as advisors based on trust and open dialogue.

It generally takes almost four years to review a BREF. Compliance with the BAT conclusions is then required four years after their publication. In practice, however, the time allowed for the transition exceeded ten years in some cases. The revision of the original EU BREF for pulp and paper manufacturing (BREF-PP, published 2001) started in 2006. It was one of the first sectors to come under IPCC. Yet, all European pulp and paper mills had until 1 October 2018 to consider the new BAT conclusions and adhere to

them in their permit to operate. Nevertheless, there were different priorities 20 years ago. Today, learning from and co-operating with EU/EC countries, institutions and networks, Kazakhstan could fast track the adoption of BAT. Industry should be engaged as early as possible in the process to ensure buy-in and active participation in the design and roll out of BAT for each sector.

Specific recommendations to plan for BAT-led environmental regulations

IGTIC is already initiating preparation of the implementation of BAT. While this is a promising expression of commitment, further clarification is needed to ensure its effectiveness. Among other areas, the key elements/tasks of the Kazakhstani transition to BAT must be elaborated in more detail. These include, for example, setting up an adequate institutional structure for BREF development and for issuance of permits, and clarifying linkages with other ministries, agencies and initiatives.[16] The approach for selecting priority sectors for BREF development, as well as the definition of the BREF (and BAT conclusions) structure and legal status, must also be clearer. Other issues include the preferred method for identification of BAT, the derivation of AEL and translation into ELV; the systems for derogations and inspections; timelines and incentives for compliance with ELV; and the communication strategy and supporting tools such as the web portal.

A convergence to a BAT-model will certainly take time and the OECD is ready and able to support it. The level of ambition for the transition will depend highly on how Kazakhstan confronts some strong vested interests to maintain the status quo. Actions could, and should, be scaled up in preparation. In the short term, irrespective of the timeline for the transition, Kazakhstan should adjust the legislation on emission standards for LCP. A first step would be to base these standards on BAT that are defined in the annexes of the amended Protocol to Abate Acidification, Eutrophication and Ground-level Ozone under the Convention on Long-Range Transboundary Air Pollution.

Furthermore, several additional actions should be considered in the short term to continue preparation of the transition plan. Benchmarking ELV on sector-specific BAT might be of value. The inclusion in the list of technologies available of those eligible for complex permits from the oil and gas sector will help. This sector is among the biggest foreign contributors to the technological upgrading of the country, with the 1% subsoil user requirement.[17] Technical co-operation with the BAT bureaus or technical centres of OECD members should be deepened. This would build on initial contacts between the IGTIC and the European IPPC Bureau in Seville. It could possibly involve a temporary exchange of staff who know how to run a BAT-led ELV development process.

The OECD is already providing some support on the design of the transition path. More and adequate strategic planning and targeted implementation support will be required. The OECD project to assist governments on BAT[18] and the GREEN Action Task Force stand ready to engage. Well-thought co-operation at a regional level would be paramount to reach the right critical mass to attract potential donors and co-developers.

Framework conditions for innovation

Innovation plays a critical role in delivering improved environmental outcomes at lower costs. Environmentally related taxes can thus encourage the development and adoption of market-ready innovation.

However, the breakthrough technologies that will lead to fundamental environmental improvements are less likely to be developed under a tax-only regime. They will be more

likely to flourish under a regime that includes incentives for research and development (R&D). The long-term and more fundamental nature of such projects, however, creates uncertainty for investors and entails a high probability of failure. There are asymmetries of information between the owner of knowledge or innovation and possible users and/or funders. The time horizon might be long for fundamental research, with uncertain prospects facing applied research. And there will be gaps between private and societal returns on R&D. Undoubtedly, there is a role for an empowering, activist and catalytic state in Kazakhstan. Environmental taxes may need therefore to be supplemented by targeted investments in R&D.

Some countries are supporting adoption of new technology "better than BAT". In these cases, an operator's investments are subsidised (e.g. up to 50% in some cases in Germany). There is, however, a need to ensure that R&D tax support towards BAT is in line with the good practices of OECD member countries. According to the Polluter-Pays Principle, polluters should not receive subsidies to clean up pollution they would be required to manage anyway to comply with laws and regulations. Hence, Kazakhstan should be careful with what sort of subsidies are offered.

Better alignment is needed with other framework conditions to improve trade, investment and innovation policies. The challenges faced by Kazakhstani innovators in green technologies are similar to those of any other innovators, and have been extensively documented (OECD, 2017[24]; OECD, 2018[25]). They encompass the following: weak outcomes of R&D activities; limited co-operation between academia and business; a fragmented R&D policy and funding framework; high dependency on the activities of foreign-owned companies; inefficiency in the business environment and investment climate; weak public procurement practices; and an underdeveloped intellectual property rights system.

Most importantly, the level of overall funding of R&D activities remains low. R&D intensity (the ratio of gross expenditure on R&D to gross domestic product [GDP]) fell from a peak of 0.28% to 0.14% over 2005-16.[19] These numbers are well below the ambitious targets set in various governmental strategies and programmes of reaching 3% of GDP by 2050 (Ministry of National Economy of Kazakhstan, 2017[26]). The number of firms with ecological innovation is still small (slightly above 310) and decreased by 7.7% in 2016.[20] However, there are some encouraging trends. Privately funded R&D accounted for more than half of overall expenditures, for example in 2016.[21] Moreover, following Expo 2017 on "Future Energy", the Ministry of Education and Science signed nine memoranda of co-operation and Kazakh universities signed 20 bilateral memoranda of co-operation.

Kazakhstan should elicit and hasten development of new technologies and new techniques. To that end, it would be well-advised to continue developing a large-scale programme of publicly funded R&D. It could also explore the potential for additional, specialised partnerships with the private sector, while maintaining and strengthening incentives for privately funded R&D.[22] Such an initiative would dovetail neatly with another major item in the larger agenda for reform, which the OECD has analysed previously (OECD, 2017[24]).

Specifically, Kazakhstan should take four key actions. First, it should implement a comprehensive and coherent framework for promoting eco-innovation by improving co-ordination of energy, innovation and environmental policies across the government. Second, it should streamline public support for R&D and ensure that it targets long-term priorities. Third, it should improve co-operation between academia and business, ensuring

sound framework conditions for business innovation. Fourth, it should develop demand for environmental goods and services. These recommendations are very much relevant for green technologies and innovation.

Kazakhstan recognises that transformation of the whole innovation ecosystem in line with national development needs will take time. In the short term, setting up mechanisms to co-ordinate and disseminate new information on abatement techniques in Kazakhstan and internationally would be a good start. A knowledge hub such as the EU Observatory of New Techniques will be a good benchmark.[23] The IGTIC is certainly a good vehicle to host such a platform, provided it is well co-ordinated. Other entities/projects could possibly compete for the same innovators, projects pipeline, funding mechanisms and, critically, most likely users. Such users include the Autonomous Cluster Fund in Almaty, the World Bank-Kazakhstan Fostering Productive Innovation Project or Energy Efficiency Project, NadLoc – the agency for local content.

Notes

[1] See (OECD, 2013[10]): The flexibility of market-based instruments was needed. CO_2 and SO_2 emissions depend to a large extent on the carbon and sulphur content of the fuels combusted. Conversely, most NOx emissions are produced through reactions with nitrogen present in the air. It is possible to tax the carbon and sulphur content of fuels to limit CO_2 and SO_2 emissions. However, other means are needed to tackle NOx emissions. Emissions will vary significantly depending on the combustion technology employed and the maintenance of the combustion equipment. The costs of reducing NOx emissions vary significantly across producers, and economies of scale and rapid development.

[2] The Dutch Air Pollution Fund offers an innovative solution in the event civil actions either fail or are, for certain reasons, rendered unavailable. Indemnification from the fund may be sought by, "anyone who has sustained loss due to sudden air pollution which should not reasonably be chargeable or wholly chargeable to him": See Environmental Management Act section 15.25(1). The relevant minister determines the level of indemnification (s 15.26(1)), though it cannot be for a sum less than EUR 225: section 15.26(2)(a), https://www.asser.nl/upload/eel-webroot/www/documents/national/netherlands/EMA052004.pdf.

[3] Effective rate of EUR 1 900 per tonne of NOx emitted to be compared to EUR 59 in Kazakhstan (or 10 MCI – the monthly calculation index – at 24 505 Tenge).

[4] See https://circabc.europa.eu/ui/group/06f33a94-9829-4eee-b187-21bb783a0fbf/library/e95a41c7-a4dd-4f58-9543-9693ba73e572?p=1&n=10&sort=modified_DESC.

[5] See EU BATC (07.2017), http://eippcb.jrc.ec.europa.eu/reference/.

[6] In the EU BREF, there is a chapter on emerging techniques.

[7] See http://ec.europa.eu/transparency/regexpert/index.cfm?do=calls.calls_for_app for further details

[8] See http://www.oecd.org/chemicalsafety/risk-management/best-available-techniques.htm.

[9] In the European Union, where an activity involves the use, production or release of relevant hazardous substances and having regard to the possibility of soil and groundwater contamination, a baseline report is to be drawn up before starting the operation of the installation or before a permit for the installation is

updated. See https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014XC0506(01)&from=EN.

[10] See https://www.impel.eu/projects/doing-the-right-things-for-environmental-permitting/

[11] Much more information is available on the Communication and Information Resource Centre for Administrations, Businesses and Citizens server, on the CIRCABC IED pages: https://circabc.europa.eu/ui/group/06f33a94-9829-4eee-b187-21bb783a0fbf/library/1d945fd8-0d7e-4418-bac4-1c2f4a91af3e.

[12] See http://ec.europa.eu/environment/industry/stationary/ied/implementation.htm.

[13] Ibid.

[14] See http://ec.europa.eu/environment/industry/stationary/ied/faq.htm.

[15] See http://ec.europa.eu/environment/archives/air/stationary/ippc/general_guidance.htm.

[16] Co-ordination and strategic alignment will be essential with main stakeholders. These include the ministries of energy, of investment and infrastructure development, of national economy, Kazakh Invest at the Ministry of Foreign Affairs, clusters and innovation projects at national or oblast-levels, or the departments for economic and industrial development in the Akimats.

[17] Subsoil users can fulfil their obligations amounting to 1% of their annual income in R&D either by investing R&D internally, for those who have an in-house R&D department, or contract R&D externally to a Kazakhstani organisation. See page 164, (OECD, 2017[24]).

[18] See http://www.oecd.org/chemicalsafety/risk-management/best-available-techniques.htm.

[19] See http://stat.gov.kz/getImg?id=ESTAT107977.

[20] See http://stat.gov.kz/getImg?id=ESTAT107979.

[21] http://stat.gov.kz/getImg?id=ESTAT107977.

[22] This includes the now familiar use of tax credits and other forms of tax preferences (OECD, 2017[24]). However, it also entails the specific obligation on subsoil users to "strengthen the national research and innovation capability" by investing 1% of their annual income in R&D. This could happen either by investing internally (for enterprises with an in-house R&D department) or contracting R&D externally.

[23] See https://ied-innovation-observatory.vito.be/. There was also a workshop with member states on emerging techniques in 2017 (https://circabc.europa.eu/ui/group/06f33a94-9829-4eee-b187-21bb783a0fbf/library/369281b8-bfd9-44db-8598-461db2cb0521?p=1&n=10&sort=modified_DESC). The Commission presented on the observatory (https://circabc.europa.eu/webdav/CircaBC/env/ied/Library/Workshops/ET%20workshop%20Leuven%2017_10_2017/2.%20Innovation%20observatory%201).

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Chapter 3. Moving to a broader and more effective range of non-compliance responses

In case of discharges by industrial operators above their emission limit value as set in the permit and project documentation, Kazakhstan's primary response is to impose administrative penalties. This chapter examines the system for non-compliance and how it diverges from the experience of OECD member countries. It considers the full range of responses of an enforcement pyramid. It offers recommendations to transition from these highly discriminatory, contested and opaque non-compliance responses to a more modern, proportionate (risk-based) and collaborative system. It concludes with specific guidelines on how to adjust the legislative acts, the principles of regulations and the tools for enforcement in Kazakhstan.

3.1. Introduction

Environmental non-compliance response comprises any actions by the competent government authority alone or in co-operation with other institutions to correct or halt behaviour that fails to comply with environmental regulatory requirements. Such responses may be designed to perform one or more functions: i) return the violator to compliance; ii) correct internal company management problems that may result (or have resulted) in negative environmental impacts; iii) impose a sanction to punish the violator while also deterring others; iv) remove the economic benefit of non-compliance; or v) correct environmental damages.

Non-compliance responses are commonly classified based on the different branches of law authorising each measure (i.e. the type of liability): administrative, civil, and criminal. A government agency applies administrative measures ("administrative enforcement"); the general aim is to restore compliance. Civil and criminal courts impose civil and criminal measures, respectively, and are sometimes referred to as judicial response. Civil enforcement generally addresses damage caused to persons or property. For example, civil judicial enforcement in the United States is intended to punish and deter and does not seek compensation for private parties. Criminal enforcement seeks penalties (that may include prison time for individuals) for egregious unlawful behaviour (OECD, 2009[1]).

3.2. Comparative analysis

3.2.1. Enforcement pyramid and the choice of response

In Kazakhstan

Kazakhstan almost exclusively applies administrative penalties to deal with violations and does not appear to consider use of any other measures. This contrasts with OECD member countries, which use an enforcement pyramid approach.

OECD member countries and the non-compliance enforcement pyramid

In most EU/OECD member countries (OECD, 2009[1]), the response to non-compliance is based on a so-called enforcement pyramid. This includes administrative and criminal measures, complemented by civil measures. The hierarchy of non-compliance responses offers a good way of achieving an optimum mix of deterrence, persuasion and coercion. Once an offence is detected, the following order of response may be used: informal warnings and directions for corrective actions; administrative notices and penalties; or criminal enforcement with prosecution and fines determined by courts. Annex B gives a comprehensive overview for OECD member countries of direct and indirect means of interventions and enabling approaches for compliance.

Effective application of the enforcement pyramid depends on two assumptions. First, it presumes that enforcement authorities are prepared to escalate sanctions where soft restorative action fails to achieve compliance. Second, it presumes that penalties at the top of the pyramid are sufficiently serious and effective to deter the possible offender.

Administrative enforcement is almost always an environmental authority's first choice response.

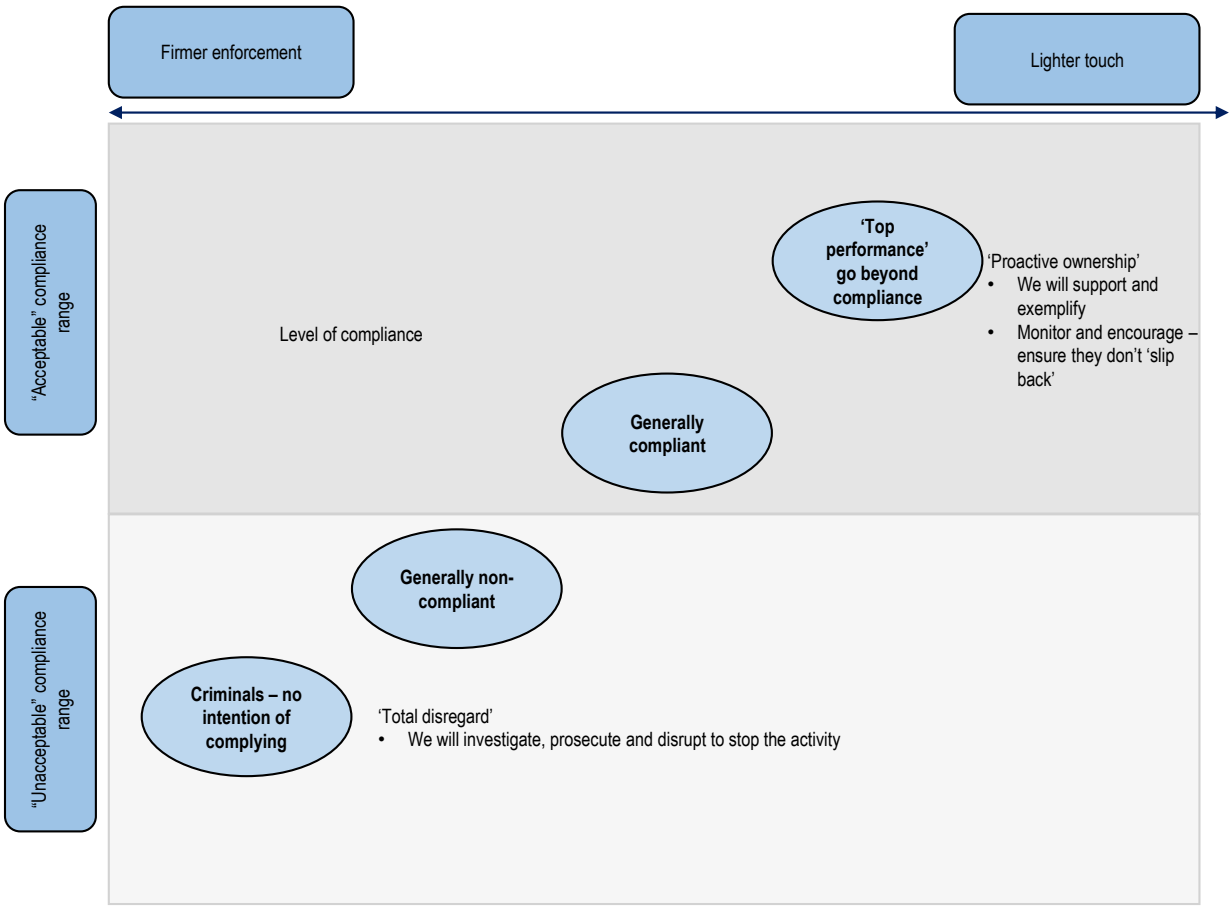
In addition, enforcement competent authorities consider the following when choosing the type of enforcement instrument:

- Cost: administrative proceedings are generally less taxing on enforcement resources in terms of time, money and personnel.
- Resistance: criminal cases evoke much stronger resistance from the regulated community than administrative ones.
- Control: enforcement authorities have much more control over administrative proceedings than over criminal ones.

Making enforcement more proportionate to non-compliance is thus the pragmatic foundation of the enforcement system in the OECD. More emphasis on administrative versus criminal response to non-compliance in several countries (e.g. in the United Kingdom and France) allows the decriminalisation of less severe violations and makes enforcement more expedient and efficient. Another aspect of modern enforcement by OECD members consists of taking more account of an offender's economic benefit from non-compliance. Economic methods to calculate and extract this benefit via monetary penalties are used in the United States and, increasingly, in the United Kingdom and the Netherlands.

Competent authorities have enforcement policies or guidelines describing how to treat offences/violations and what actions to take. Examples include the Environment Agency in England's Enforcement and Sanctions Policy and Guidelines, and the US Environmental Protection Agency's Enforcement Response Policies. These provide generic principles for the approach to enforcement and specific guidelines for applying sanctions, according to legislative requirements. In addition, the Environment Agency in England uses a compliance-enforcement model to support decision making, based on the level of observed compliance (see Figure 3.1).

Figure 3.1. Environment Agency (England) compliance enforcement model



Source: (Foreman, J. (ed.), 2018[2]).

More than 70% of violations in England and Wales are addressed through persuasion. Less than 20% are addressed by administrative enforcement notice (the remaining cases are referred for prosecution) (OECD, 2009[1]).

About 80% of all violations in the Netherlands are corrected without use of any formal actions by the competent authority; fines are imposed only in a small fraction of cases. This is the case as well in most countries with a well-developed environmental regime, especially where most regulated organisations are generally in compliance (OECD, 2009[1]).

3.2.2. Administrative enforcement

In Kazakhstan

Monetary penalties (fines) are the most widespread administrative environmental enforcement instrument used, in common with most countries in Easter Europe, Caucasus and Central Asia (EECCA). Current practice is to default to monetary penalties (i.e. fines) for all non-compliances, regardless of cause and effect.

Kazakhstan does not appear to use any non-repressive measures such as informal or formal warnings, cautions and notices. All identified violations are treated with sanctions,

normally financial penalties. The CERC has even set targets for revenue collection through penalties.

The authorities do not apply rules-based principles and methods commonly used in OECD member countries. As a result, they are not seen to operate in a fair, consistent or transparent way.

OECD member countries

Administrative measures are generally the preferred tool to enforce environmental legislation for a number of reasons (OECD, 2009[1]). Administrative enforcement is faster and cheaper than going through the courts. In many countries, administrative enforcement offers the government a wider range of instruments to deal with violations. Administrative enforcement measures (i.e. responses) can be classed as either non-repressive or repressive (i.e. with sanctions).

In Japan, administrative actions are designed to guide or order operators to comply with the requirements, but not to impose penalties. Competent local governments promote regulatory compliance by businesses mainly through inspections and by issuing administrative guidance based on inspection results. Most businesses take steps to comply with the guidance: the intervention of the authorities is already considered as a sanction. The potential loss of reputation for Japanese companies is likely a more important deterrent than it would be for companies in other countries. Stricter enforcement measures are imposed only if the emission/effluent limits are exceeded significantly or repeatedly.

Upon detection of a violation in the Netherlands, the competent authority would most often issue an informal verbal warning. This can be followed by more informal contacts between the offender and the competent authority. A formal warning, if needed, is then issued that prescribes corrective actions and setting a time limit to correct the violation. Sanctions are issued in only about 7% of cases. They are not imposed if the violation has been corrected in a timely manner. Similarly, they are not imposed if the act was not deliberate, an isolated incident, of limited extent and impact, or has been committed by an operator with an otherwise good compliance record.

In Finland, if a violation is discovered, the operator is allowed, sometimes during the inspection itself, to plan corrective actions to return to compliance. If the operator fails to present a compliance plan or the competent authority judges its actions are inadequate, then the latter issues a compliance notice.

In the United States, most federal actions against businesses or individuals for failure to comply with the environmental laws are resolved through settlement agreements. These almost always involve payment of a penalty. About 75% of administrative cases and 90% of civil judicial cases are settled.

In the United Kingdom, enforcement undertakings are promises by the violator to the regulator to take specific compliance actions as an alternative to prosecution. A period of negotiation would take place where the competent authority either accepts or rejects the proposed actions. If the proposal is rejected, the authority may choose any sanction available for the original violation. If the proposal is accepted, the enforcement undertakings are formally agreed and monitored by a regulator. The company would be immune from any sanction for that particular offence, unless it fails to comply with the undertakings.

3.2.3. Penalty assessment

In Kazakhstan

In the Administrative Offence Code, environmental penalties are based on a volume of over-limit emissions multiplied by a rate. For large enterprises, the multiplier is the rate in the Tax Code for the relevant pollutant and form of pollution. In the case of small and medium-sized enterprises (SMEs), the multiplier is the monthly calculation index (MCI) published by the government from time to time.

There are two kinds of environmental penalty discrimination. First, large enterprises pay higher penalties per unit pollution since most of their Tax Code rates are higher than the MCI for SMEs. This already-higher payment amount is increased a further ten times for all cases of over-limit emissions by large enterprises. Second, oil and gas companies pay far higher penalties per unit of emissions than other large enterprises. The Tax Code rates for gas flaring are much higher than those for the same volume of emissions of a given pollutant from other stationary sources (e.g. power, steel, mining, coal).

Kazakhstan recognises it must end discrimination in environmental penalties if it wishes to move towards an OECD paradigm. In 2018, the Concept on Accompanying Legislation (and Concept for the revised Environmental Code) acknowledged the discrimination and called for its elimination. It explicitly recognised that, for the same amount of pollutants, punishment can vary from thousands of tenge to millions of US dollars, depending on the business entity. Such a wide gap in punishment for the same violation is not consistent with the rule of law, and the principle of fair and equal punishment for the same damage or public danger.

OECD member countries

The penalty system in the OECD entails some degree of discretion from the competent authorities. However, this discretion is not unlimited. And what OECD members have in common are the principles and components of designing on applying environmental penalties/fines. Authorities can impose a range of minimum and maximum amounts for each violation. These are typically charged per day, although sometimes per incident. For example, Dutch competent authorities usually have guidance documents defining the types of violation, penalty rates per day and a maximum fine per violation (e.g. EUR 50 000 in the province of Groningen). In Texas and other US states, failure to comply with notification and permitting provisions entails maximum daily fines in the range of USD 10 000 per day.

1. To be an effective enforcement instrument, administrative penalties/fines are designed with the following main principles:

- Deter future non-compliance.
- Eliminate any financial gain or benefit from non-compliance.
- Stay proportionate to the nature of the offence and the harm caused.
- Be responsive and consider what is appropriate for the particular offender and regulatory issue.

The first goal of a penalty is to deter people from violating the law. Specifically, the penalty should persuade the violator to take precautions against falling into non-compliance again (specific deterrence). It should also dissuade others from violating the law (general

deterrence). Successful deterrence is important because it provides the best protection for the environment. In addition, it reduces the resources necessary to administer the laws by addressing non-compliance before it occurs. In some countries, such as Norway, the threat of so-called "coercive fines" may be used. In these cases, the fine is imposed even before a violation is identified. This is designed as a preventive instrument to achieve compliance with the requirements (OECD, 2012[3]).

Measuring environmental harm is inherently difficult. In practice, different measurement techniques can produce different results. This is one of the reasons why most environmental enforcement agencies do not make economic efficiency the goal of their activities. Instead, they try to base the fines on gain to the violator rather than on the harm from the offence (OECD, 2012[3]).

Consistency, fairness and flexibility are guiding principles in OECD jurisdictions when implementing penalties and fines. Otherwise, regulated entities may perceive the fines as arbitrary. Appeals against those penalties would consume agency resources and slow down the resolution of environmental problems caused by the violations. A fair system for calculating penalties must also have enough flexibility to adjust for legitimate differences between similar violations. Flexibility should account for at least five relevant differences between enforcement cases. First, it should consider the degree of wilfulness and/or negligence of the offender. Second, it should consider the history of non-compliance. Third, it should consider the ability to pay. This, in turn, includes whether a penalty could result in plant closure, bankruptcy or other extreme financial burden, and adjustments/alternatives to the originally chosen penalty. Fourth, it should consider whether there is an important public interest in allowing the firm to continue in business, such as local employment. Fifth, it should consider the degree of co-operation/non-cooperation with the enforcement agency. Other factors specific to the violator or the case may also inform a decision.

As good practices, OECD member countries establish and disseminate the defined and transparent process to make penalty decisions. They then document how penalties have been developed and applied. These are the following steps:

- Calculate the benefit component using a model or a simple discount rate method. Penalties should remove any economic benefit resulting from a failure to comply with the law. This should include both costs avoided and any competitive advantage gained from non-compliance. This issue is well-covered in sections 3.2, 3.3 of the OECD report (2009[4]).
- Calculate the seriousness (gravity) component (e.g. using regulation-specific tables or matrices). A proportion of the penalty should reflect the seriousness or gravity of the violation. This will include a reflection of the harm to the environment (if caused), potential risk to the environment and the importance of legal requirements. This is amply covered in Chapter 4 of the OECD guidance on fines (OECD, 2009[4]).
- Apply appropriate adjustment factors to the gravity component. The competent authority should describe the facts and reasons, which support such adjustments (e.g. multipliers). These will depend on pertinence of various factors (e.g. the public interest and other factors such as seriousness of the offence, repetition or failure to comply with a notice).
- Add up the benefit and gravity components, and apply "the ability to pay" factor, if appropriate. The following options consider the ability to pay:

  - Delayed payment schedule: such a schedule might even be contingent upon an increase in sales or some other indicator of improved business.
  - Non-monetary alternatives: company officials may be compelled, for example, to participate in environmental awareness campaigns in the media.
  - Penalty reduction as a last recourse: if this approach is necessary, the enforcement agency's conclusion as to the size of the necessary reduction should be justified and communicated.

- Record and measure outcomes (evaluate effectiveness). The competent authority should maintain records on its use of administrative fines. The records should be used for reporting, performance assessment and public disclosure. Public disclosure of enforcement actions accomplishes two goals. First, it informs the public that the enforcement agency is responding to non-compliance. Second, it demonstrates to the regulated community the agency's commitment to enforcing compliance.

In addition, to ensure the effectiveness of penalties, policy makers should consider the likelihood that an offender will be caught and punished as a result of other compliance assurance and enforcement activities. A penalty or other sanction cannot be applied unless the offence is first detected, for example, as a result of monitoring, checking and reporting.

3.2.4. Civil judicial enforcement

In Kazakhstan

Kazakhstan citizens have the right to bring lawsuits for individual or collective private damages for harm to their health or property under the Civil Code.

OECD member countries

Traditional civil liability is aimed at the compensation of a private party for the damages or injuries caused to persons or property. Civil suits brought by private parties are an important enforcement tool in OECD-reviewed countries (OECD, 2009[1]).

In OECD member countries, citizens can bring lawsuits to seek damages compensation for harm to their property or health. However, as custodians of the public good with an authority to protect public natural resources, they typically cannot file a lawsuit on behalf of the public (see section 3.2.6 on citizen enforcement).

3.2.5. Criminal enforcement

In Kazakhstan

Kazakhstan law provides for criminal liability for environmental violations. Through amendments to the Criminal Code[1] in 2014, material damage measured by civil monetary damages above a certain threshold became an element for establishing the crimes of pollution to the air, water or land. This created anxiety among investors, given Kazakhstan's history of bringing criminal actions against senior personnel of investment projects for tax, customs and other regulatory violations. Investors consider these to be administrative or civil concerns in OECD member countries. In view of the well-known formalistic approach of Kazakhstan's law enforcement officers, investors feared that cases in which the amount of monetary damages simply exceeded a relatively low threshold

would qualify as crimes or potential crimes (American Chamber of Commerce in Kazakhstan, 2018[5]).

Foreign investors often cite the criminalisation of civil and administrative law matters in Kazakhstan as detrimental to the country's investment climate. They argue it creates a risk factor that dissuades new foreign investment. First President Nazarbayev, in addition to requiring adoption of OECD standards, called for the decriminalisation of "economic crimes of low societal danger" in his address to the people of Kazakhstan on 31 January 2017 (Nazarbayev, 2017[6]).

Kazakhstan law also requires criminal intent for liability. However, in practice, defence attorneys have observed that prosecutors make little effort to prove criminal intent in criminal cases involving actions brought against employees of foreign-owned companies for regulatory violations. Instead, they typically treat establishment of the fault element as an assumption based on the fact of the violation. The courts often accept this tendency and do not demand evidence of the defendant's criminal intent (American Chamber of Commerce in Kazakhstan, 2018[5]).

OECD member countries

Criminal enforcement is usually the action of last resort, taken only in response to serious cases of wilful or negligent unlawful behaviour. It may also be used where administrative law has not been sufficient to ensure compliance. Criminal offences are generally related to serious damage to, or endangerment of, human health or the environment. They can also be "technical", such as operation without a permit.

Criminal sanctions represent both a punishment and a deterrence, as they have a major reputational impact on the convicted party. Consequently, and understandably, the burden of proof (i.e. the level of evidence) for such criminal cases is much heavier than for any with other enforcement approaches.

In the United States, for environmental criminal actions to be enforced under the Clean Air Act (CAA) or the Clean Water Act (CWA), the defendant would need to have violated legislation intentionally. The potential for criminal liability would exist if there is an indication that a person released air pollutants, for instance, not for safety reasons, but rather for illegal or pecuniary motivations. To establish a criminal liability under the US CWA and CAA, a "knowing" violation is required.[2] Criminal liability arises from the defendant's state of mind in causing the violation. The establishment of "knowing," or criminal intent, would require evidence of egregious, self-serving conduct, or operations without a permit. Typically, these operations are for personal or corporate gain or to avoid expenses, and accompanied by falsification of information or other fraudulent acts.

Box 3.1 provides typical criteria and scenarios for criminal investigations of environmental violations. Initiation of a criminal investigation would be unlikely if the polluter immediately notified authorities about the violation. Environmental criminal law enforcement authorities, in the absence of an indication or lead suggesting wrongdoing, will not typically investigate merely to search for intentional or criminally negligent malfeasance. They may do so, however, if there is a high level of harm (e.g. an oil spill, a death at a chemical plant). For example, criminal investigations are rare or non-existent for emergency gas flaring either by the federal authorities under the CAA or by state authorities under state laws. There might have been some cases of civil enforcement, however.

Box 3.1. Environmental criminal investigation in the United States: Common violation types

Typical violations that result in investigations may involve, but are not limited to:

- illegal disposal of hazardous waste
- export of hazardous waste without the permission of the receiving country
- illegal discharge of pollutants to a water of the United States
- removal and disposal of regulated asbestos containing materials in a manner inconsistent with the law and regulations
- illegal importation of certain restricted or regulated chemicals into the United States
- tampering with a drinking water supply
- mail fraud/wire fraud
- conspiracy
- money laundering relating to environmental criminal activities.

Source: (UN EPA, 2018[7]).

In OECD member countries, a competent authority, or the police, will usually initiate criminal environmental enforcement by referring the case to a public prosecutor. In England and Wales (but not in Scotland and Northern Ireland), the Environment Agency or a local authority can prosecute criminal cases directly. Criminal prosecution is often launched in parallel with administrative actions. Some environmental authorities (e.g. certain regional departments for industry, research and environment in France) have policies to issue statements of criminal offence in every case of non-compliance with a compliance notice. Others refer only the most important cases to the prosecutor's office.

In England, the Environment Agency's Enforcement and Sanctions Policy sets out grounds for taking criminal enforcement action. In the United Kingdom, there is a clear separation of responsibility for criminal enforcement/prosecution and the resultant criminal sanctions (e.g. fines and sentences), which are imposed by law courts. The environmental authorities contribute to Sentencing Guidance for judges on how to approach sentencing for environmental offences. This Guidance is not prescriptive, but rather indicates the factors to be considered. They include the following:

- liability related criteria (culpability of the offender)
- the potential risk brought about by an offence
- the offender's ability to pay (facility closure should be avoided where possible)
- the overall deterrence effect of the sentence (fines on companies should be large enough to make an impact also on shareholders)
- the offender's co-operativeness
- the prosecution costs.

In the Netherlands, France and Finland, criminal and administrative and enforcement go in parallel. The environmental authorities refer potential criminal cases to the police or a public prosecutor and continue administrative proceedings. They therefore have little control over the prosecutor's decision on whether to pursue a case and bring it to a criminal court.

3.2.6. Citizen enforcement

In Kazakhstan

The public has the right to participate in decision-making processes and be informed of their consequences. To that end, they have access to permit applications, permits and the results of the monitoring of releases. This is in line with the United Nations Economic Commission for Europe Aarhus Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters, to which Kazakhstan is a signatory.

More recently, the Committee on Environmental Regulation and Control has said it may include in the new Environmental Code a right of citizens to bring lawsuits against companies for environmental damage in the public interest.

OECD member countries

Citizen enforcement usually means the pressure exerted by citizens on government agencies, through complaints or in court, to enforce regulatory requirements. It does not cover civil liability cases when individuals or groups of citizens are direct victims of pollution (OECD, 2009[1]).

There are numerous benefits to enabling the public to participate in environmental enforcement. First, local citizens directly affected by a violation are often better positioned to detect and evaluate the impact of the violation on the environment and their community. Second, citizen enforcement saves resources for enforcement authorities and reinforces the government's position against the sometimes-powerful political influence of offenders. Citizens/groups/non-governmental organisations (NGOs) can lobby for enforcement actions, or use civil courts to appeal decisions to grant permission to operate, to not enforce laws, or not to prosecute.

- In the United States, statutes give citizens the right to bring actions to compel the state to enforce its own environmental damages laws. Other laws empower citizens to bring damages actions for harm to their property and health. However, the environmental damages laws do not typically empower citizens' groups to stand in the shoes of the state and bring a natural resources damages claim against polluters to protect the country's environment.
- The Environmental Agency in England has been successful in turning around adverse publicity for high risk/profile sites. It has put in place a recognised process that brings industry and local communities/citizens together, encouraging companies to take the lead role rather than the Agency. There is also potential to encourage citizen "monitoring" where regulatory resources are limited. Citizens, for example, can use a hotline to report pollution incidents. Mobile telephone apps are also being developed for reporting environmental problems such as incidences of invasive species. Box 3.2 provides more details.

Some countries have given opportunities for citizens to intervene in environmental enforcement. For example, in the Netherlands, NGOs on behalf of the public, as well as citizens, can take actions if competent authorities do not adequately enforce environmental requirements. They can petition the authority and, if that is not enough, can file a case against the authority in an administrative court. In the past, the Dutch environment ministry covered the costs of legal environmental advisors to citizens and local NGOs employed by "social law firms". This is no longer the case. A competent authority's "non-enforcement"

decisions can also be appealed in an administrative court, and in some countries through "judicial review". Dutch NGOs such as Natuur en Milieu also put pressure on competent authorities through direct mailings encouraging them to do a better enforcement job. For criminal enforcement, citizens can contact the police, or an NGO can go directly to a public prosecutor. If a prosecutor does not pursue the case, a suit against the violator can be filed in a criminal court. In some cases, NGOs pursue administrative and criminal routes at the same time.

Box 3.2. Examples of public consultation programmes and tools

Environment Agency (England) good practice – Statement on Public Participation

Public participation helps the Agency make better decisions. It can make use of the expertise of others and make sure the Agency has considered all the environmental risks.

Consultation is built into the environmental permitting process including on:

- development of standard rules, including risk assessments
- applications for all bespoke permits and standard permits for installations
- applications for substantial change of bespoke permits and mining waste facilities
- applications to vary permits, including for "sites of high public interest".

Consultations are publicised on line, while emails are sent to organisations with a known interest.

There is enhanced consultation on "Sites with High Public Interest". This includes direct engagement with local communities – individuals and groups – on draft permits and decision documents.

Decision documents provide a transparent means to communicate the rationale behind decisions to interested parties. In high-profile cases, they allow input to the decision-making process.

Environment Agency (England) good practice – Building Trust with Communities Programme

The Environment Agency works with the public, community groups and other organisations to help solve environmental problems and build trust in the services it provides using a six-step approach:

- Step 1 Understanding the community – how it works.
- Step 2 Why work with the community?
- Step 3 Understanding the community – its people.
- Step 4 Agreeing the best way of working.
- Step 5 Starting work and checking progress.
- Step 6 Reviewing work – lessons learned and sharing experiences.

Source: Author's elaboration based on interviews and desk research.

3.3. Proposed recommendations

3.3.1. Fully use compliance assurance and approaches of an enforcement pyramid

Kazakhstan should change from an enforcement-led system, with overreliance on administrative penalties and fault-based damages to one that delivers effective, risk-based, environmental protection. This approach should include all elements of compliance assurance including:

- compliance promotion – educating and enabling good practice for effective management of compliance, including provision of clear and accessible guidance on complying with legal requirements
- compliance monitoring and assessment, including risk appraisal and a range of compliance checking tools and approaches such as state monitoring and inspection, audits, assurance schemes, recognition of management systems and independent monitoring and verification of performance
- citizen participation in monitoring and reporting of environmental performance
- use of an enforcement pyramid to help choose appropriate responses and interventions as set out in the OECD guidance report (OECD, 2009[1]).

Ensuring a verifiable approach to state monitoring and inspection is a prerequisite for more effective enforcement. This point is further developed in the ways forward, particularly the role of data availability, quality, monitoring and evaluation.

To better balance the mix of "traditional" compliance and enforcement measures with new interventions, the Ministry of Energy should build on the work of international networks that promote implementation and enforcement of environmental laws.

- The European Union Network for the Implementation and Enforcement of Environmental Law, for example, has developed comprehensive toolkits and methodologies. These include choosing Appropriate Interventions Guidance (e.g. Logic Modelling[3]) (IMPEL, 2008[8]). This methodology has two helpful features: a list or typology of the different types of intervention and common practice; and a step-by-step method for evaluating and choosing the right mix of interventions. It has also developed the Easytools/IRAM (risk assessment methodology);[4] Doing the Right Thing (inspection planning);[5] and Recommended Minimum Criteria for Environmental Inspections.[6]

3.3.2. Reform the system for penalties/fines following a min-max amount per day, non-discriminatory model with a gravity component

Kazakhstan should put in place a new system that would include several new characteristics in line with a modern OECD paradigm.

Non-discrimination. The same rules and penalty levels should apply to all forms of emissions of pollutants, regardless of industry, the size of enterprise or the ownership. On this basis, Kazakhstan should reform its highly punitive system of Associated Petroleum Gas flaring payments (penalties and damages). Since administrative penalties are based on the tax rates, administrative penalties for gas flaring are higher than those for emissions of the same pollutants from other stationary sources.

Distinct and separate methodology for determining penalties/fines following a min-max amount per day model. The penalties calculation should not be linked to rates in the Tax Code or an index. It should not be based on a volume times rate system, but rather limited to a maximum penalty per day, or per incident, as in OECD member countries. The maximum per-day penalty for breach of emissions limits should not exceed the maximum per-day or per incident penalty levels for analogous emissions in OECD member countries. Authorities should not have discretion to impose penalties higher than the maximum per-day limits set forth in the pre-established range.

Gravity component within the range of the maximum amount per day. Introduction of a gravity component and use of analytical tools to estimate the financial gains from non-compliance could also be considered. Since 1984, the BEN model developed by the US EPA calculates economic benefits enjoyed by a facility during its time of non-compliance. The model can estimate savings from deferred capital investments in pollution control equipment, deferred one-time expenditures (such as establishing self-monitoring systems), and reduced operation and maintenance costs of environmental equipment (US EPA, 2019[9]).

Consensus with key stakeholders. Stakeholders should help develop the approach to set penalties. Relevant parties include key government ministries (justice, finance, energy/environment), regulatory/enforcement agencies, business associations, companies and other interested parties, including citizens and NGOs.

National-level enforcement policies. Competent authorities in the oblast should not have the discretion to impose penalties higher than the maximum per-day limit. This will ensure nationwide consistency and transparency of enforcement decisions.

Adequate flexibility. Policies should allow competent enforcement authorities to account for unique circumstances of each enforcement case. Administrative fines for environmental offences can be adjusted for the violator's intent, degree of co-operation with the enforcement agency, compliance record and ability to pay. However, this adjustment should not exceed half of the fine's gravity component (which, unlike the economic benefit component, is the "pure" penalty). Any such adjustment should be properly documented. At the same time, options may be available for partial replacement of monetary payments of fines with alternative environmentally beneficial expenditures (OECD, 2009[1]).

Options for alternative environmentally beneficial expenditures. Alternatives for partial replacement of monetary payments of fines should be envisaged. The enforcement agency may have administrative discretion to replace part of an assessed monetary penalty with an environmentally beneficial expenditure by the offender. In several OECD member countries, such as the United States, the regulated community has been receptive to this practice. They believe it helps an offender repair its public image tarnished by the violation. This instrument is different from non-monetary alternatives or penalty reductions based on inability to pay (OECD, 2009[4]). Under the US EPA's Supplemental Environmental Projects (SEP) Policy (1998), an offender may volunteer to undertake an environmentally beneficial project related to the violation. In return, the offender will receive a reduced penalty (a ratio may be USD 3.00 in SEP spending to USD 1.00 in penalty reduction). For example, a SEP might include provision of training or technical support to other members of the regulated community to achieve, or go beyond, compliance with applicable environmental requirements.

3.3.3. Delink criminal liability from civil monetary damages

Kazakhstan should delink criminal liability from civil monetary damages to improve the investment climate and align Kazakhstan environmental criminal law with OECD standards. A criminal investigation should only be initiated where there is an indication that a person intentionally and deceitfully violated a criminal statute, exposing the population and environment to harm.

Criminal enforcement should therefore be covered by an **enforcement policy.** This policy sets out the grounds for criminal offences and a transparent process for state authorities to determine whether to pursue criminal proceedings. Such a policy (and process) can be used to determine whether to take administrative, civil or criminal sanctions. These decisions would be based on recognised criteria such as the degree of environmental damage, seriousness of violations, and the intent and attitude of the offender.

A clear enforcement policy and robust process to determine criminal liability and sanctions should help ensure that certain practices are not possible. These include setting fault-based damages and automatic criminal sanctions – for example, when exceeding emission limits alone with no other factors considered such as environmental harm, negligence and deliberate illegal actions.

The issue of proving criminal intent and whether prosecutors and judges take this into account in criminal proceedings (court cases) is a judicial rather than environmental matter. Specifically, it is for the judicial system and process, including relevant legal codes. However, environmental authorities can provide guidance/criteria for courts/judges to help with sentencing. This guidance would be based on the environmental and regulatory seriousness and consequences of offences (as the Environment Agency does in the United Kingdom).

In practical terms, the Prosecutor General and the Minister of Energy should develop a **joint order.** This would set forth detailed criteria on what types of evidence suggest the **presence of intent** and what types of events clearly exclude intent. See section 3.2.5 for additional examples. The enforcement policy should clarify the applications of sanctions and whether administrative, civil or criminal responses are appropriate. Having a **separate system to classify incidents** based on the significance of the damage to the environment would also be essential. In the United Kingdom, there are four levels of incident. Criminal proceedings would only be taken where incidents are level 1 or 2 involving significant risk/harm.

Specific guidance for the main industries should subsequently be developed. A BAT document for oil and gas production could provide more guidelines to set out the circumstances in which gas flaring is a legitimate technique. For example, it could be used because of the functioning of automatic pressure safety valves or based on the operator's decision to prevent increased pressure for greater safety. Such guidance would help in two ways. First, it would allow appropriate permit conditions (for gas flaring) to be set. Second, it would set out the circumstances in which flaring is justified. This would help prevent unnecessary "technical" violations and enforcement sanctions.

Importantly, however, **notification should not eliminate environmental liability**. If the environment has been polluted and harmed, an offender's notification can be a mitigating factor indicating good intent and attitude. However, if an incident has caused major and/or irreversible damage to natural resources or endangers loss of human life, the relevant operator should still be liable for criminal sanctions, as well as civil and administrative corrective actions. It should also be liable for the costs of restoration and compensation for

the actual damage caused. The situation might differ if actions have also been taken to prevent or mitigate harm. Such actions could include good management systems to prevent, contain or mitigate an accident or incident.

Further to this, the environmental enforcement policy document should also reflect the **evidence required in support of criminal investigations and proceedings.** For example, such evidence could include a generally applied threshold and process, which are in most cases not specific to environmental crimes. **Clear sentencing guidelines for environmental damages** (e.g. provided by the Prosecutor General or the Ministry of Energy) could also improve court decisions and interpretations of all the above cases. An **appeals process** could address issues of Kazakhstani officers not following guidance on the application of penalties and sanctions. This would be part of an enforcement policy.

3.3.4. Improve the effectiveness of penalties

Information can help policy makers and implementing authorities determine the effectiveness and efficiency of using fines. For example, data and information on fines can be used to identify repeated non-compliance by already sanctioned offenders. This, in turn, can help policy makers consider the different factors causing/contributing to non-compliance and, hence, determine appropriate penalties.

In practice, Kazakhstan would thus need to do the following:

- Improve the collection of administrative fines for environmental offences and make the fines a more credible deterrent against non-compliance.
- Upgrade the system of management, reporting and public disclosure of data and information on offences and the application of penalties to analyse the effectiveness of the enforcement response. The section on data management in the conclusions and ways forward in this report substantiate this further.
- Disseminate information about significant penalties to the regulated community and the general public to reinforce deterrence against future non-compliance.

3.3.5. Adjust legislative acts, principles and tools for enforcement

Principles of good regulation

Competent environmental authorities in Kazakhstan should ensure that all the legislative acts, principles, structures, processes and tools underpinning the Environment Code, apply methodological and management guidance. This guidance was set forth by the OECD in its report on Determination and Application of Administrative Fines for Environmental Offences: Guidance for Environmental Enforcement Authorities in EECCA Countries (OECD, 2009[4]). Box 3.3 provides a summary.

Box 3.3. OECD guidance for determining and applying environmental penalties (fines)

- Ensure that administrative fines are applied to legal entities such as companies and their legal owners/operators (juridical persons).
- Identify and obtain the consensus of key stakeholders. These include relevant government ministries (justice, finance, energy/environment), regulatory/enforcement agencies, business associations, companies and other interested parties such as citizens and non-governmental organisations.
- Ensure that legal requirements and methodologies for determining and applying environmental penalties account for economic benefits of non-compliance and the seriousness of an offence in the calculation of administrative fines.
- Dissociate the part of a fine reflecting the seriousness of the offence from the assessment of civil liability for environmental damage and the calculation of pollution charges.
- Extend the time limits for the imposition of the fines by competent authorities to allow for adequate evaluation of the economic and gravity components of a fine.
- Establish national-level enforcement policies to ensure nationwide consistency and transparency of enforcement decisions, including the imposition of administrative fines.
- Allow adequate flexibility for competent enforcement authorities to account for unique circumstances of each enforcement case, taking into account the factors set out in OECD guidance (or reference section of report).
- Provide options for partial replacement of monetary payments of fines with alternative environmentally beneficial expenditures.
- Take measures to improve the collection of administrative fines for environmental offences. Competent authorities (environmental enforcement agencies or other bodies) should use more actively the payment enforcement means at their disposal and the recourse to courts to increase the collection rates beyond 90% and make the fines a more credible deterrent against non-compliance.
- Upgrade the system of management, reporting and public disclosure of information on the application of non-criminal monetary penalties. Competent authorities should improve the management of data on offences and respective administrative fines to make it possible to analyse the effectiveness of the enforcement response.
- Disseminate information about significant penalties to the regulated community and the general public to amplify the deterrence against future non-compliance.

Source: (OECD, 2009[4]).

In line with the Recommendation of the Council on Regulatory Policy and Governance (OECD, 2012[10]), Kazakhstan should continue to implement principles of good environmental regulation (e.g. led by results and evidence, proportionate, consistent, transparent and accountable). The United Kingdom provides useful guidelines (UK Better Regulation Task Force, 1997[11]). In addition, the Netherlands has produced the "Table of Eleven". This aims at aiding the formulation of policies with a high compliance factor (see Box 3.4), which can serve as a checklist for all stages of policy design, implementation and evaluation.

Box 3.4. The Netherlands Table of Eleven: Definition of key factors of compliance

Factors of voluntary compliance and the influence of compliance promotion

1. Knowledge of rules – familiarity of the regulated community with the regulation and the clarity of requirements.

2. Cost-benefit considerations – advantages and disadvantages of compliance in terms of time, money and effort.

3. Level of acceptance – the extent to which policy and regulations are (generally) accepted by regulated entities.

4. Loyalty and obedience – innate willingness of regulated entities to comply with laws and regulations.

5. Informal monitoring – possibility of detection and disapproval of non-compliance by non-government actors.

Monitoring dimensions – the influence of compliance monitoring

6. Informal report probability – possibility that an offence is reported by non-government actors (whistle blowing).

7. Monitoring probability – likelihood of being subject to inspection by competent authorities.

8. Detection probability – possibility of detection of an offence by competent authorities.

9. Selectivity – chance of inspection as a result of risk-based targeting of firms, persons or areas.

Sanctions dimensions – the influence of enforcement

10. Sanction probability – possibility of a sanction being imposed if an offence has been detected.

11. Sanction severity – stringency and type of a sanction and adverse effects associated with it.

Source: (van der Schraaf and Roessen, 2004[12]).

Risk management and compliance assurance

Kazakhstan should also recognise and learn from OECD and EU good practice in areas related to sector strategies for risk assessment, integrated and simplified permitting, and enforcement policy.

With respect to sector strategies, the Environment Agency in England initially established strategies for sectors subject to environmental permitting, but now includes all the players within a sector. The plans focus on the most significant risks and impacts of the sector to the environment. They set out performance targets agreed with the industry to improve compliance and meet additional, voluntary goals that go beyond legal and regulatory requirements (Foreman, J. (ed.), 2018[2]).

The move from command and control to risk management and compliance assurance is clearly visible in all OECD member countries. This is occurring because compliance promotion is an efficient approach to achieving compliance for both businesses receiving assistance and incentives, and for regulators that can save resources on enforcement. As part of this initiative, the Environment Agency (England) has also developed standard rules (conditions) for permits based on generic risk assessments for certain sectors. This enables a simplified permitting process for sectors, which are either low risk or homogenous in nature. Permit applications can be made on line and, subject to local checks, can be determined and issued electronically. This process is managed by a National Permitting Centre.

Risk-based targeting of compliance monitoring allows competent authorities to increase the efficiency of compliance assurance and reduce the unnecessary administrative burden on other regulated businesses. Examples include targeting inspections on facilities engaged in activities with a potentially higher impact on the environment or with poor compliance records. This trend is present in almost all OECD member countries, although targeting approaches vary. The United States, Finland and France, for example, define risk-based categories of installations and respective minimum inspection frequencies. The United Kingdom and the Netherlands, conversely, use formal scoring systems. Through sophisticated inspection targeting, British and Dutch competent authorities have actually reduced the overall number of site visits, while increasing the number of in-depth compliance audits at high-risk installations. There is increasing evidence that better targeted inspections result in a higher rate of detection of non-compliance. Therefore, they have more effective and efficient compliance assurance programmes.

Box 3.5. Examples of risk-based approaches

The Environment Agency in England uses two key risk-based approaches. It uses a **Risk Assessment Methodology** (H1, short for Horizontal Guidance Document 1) to determine the level of environmental risk posed by applicants for environmental permits. The applicant provides information on the risks associated with its activities, location, emissions and management competence, among other factors. Agency staff use the same process to develop a risk rating and to determine the appropriate level of permit, including any improvements needed prior to issuing a permit.

Once a permit has been issued, the **Operational Risk Appraisal (OPRA)** assesses the management of operational risk on an ongoing basis using similar criteria to those in the H1 Guidance. An annual OPRA "score" is produced which, as well as rating the level of "residual risk", also informs the annual charges paid to the Agency. The OPRA rating includes an additional factor: the compliance history of the permit holder. A better overall risk rating (i.e. a permit holder with lower risk) lowers the charges as a result of reduced compliance and enforcement (e.g. inspection and monitoring).

Source: (Environment Agency, 2014[13]).

Self-monitoring and use of third-party assurance

Kazakhstan should assess the role of self-monitoring and use of third-party assurance by the regulated community. Responsibility for monitoring of industry's environmental impacts is shifting from regulatory agencies to operators themselves. This gives businesses more ownership of compliance and increases the efficiency of compliance monitoring. These elements of "self-regulation" can be balanced (and rewarded) by streamlining the state's requirements for businesses. For example, the state could reduce routine inspections, introduce electronic reporting and encourage independent verification of self-monitoring reports.

A number of environment agencies in the OECD and European Union have compliance approaches that make use of organisations' management systems. The Environment Agency (England) requires all Integrated Environmental Permit holders to implement a management system to ensure compliance with requirements. There are good reasons for moving in this direction:

- Many large and complex organisations already use management systems and a significant proportion (around 30%) employ independent (accredited, certified) auditors to verify their performance.
- Environmental regulators lack resources to maintain historic levels of inspection; there are diminishing returns for inspection-based regulation and enforcement for organisations with effective management systems in place.
- A management system approach offers a structured, standardised method for managing compliance and for monitoring, evaluating and improving overall environmental performance.

- Proportionality – a fit for purpose management system – can reflect the type, complexity and potential risks of activities.

The government should encourage adoption of formal environmental management systems and independent verification, such as ISO 14001 and the Eco-Management and Audit System (EMAS). While EMAS is available worldwide to help reduce the environmental impact of (industrial) operations, no resource user has applied it to Kazakhstan to date. The increase in the number of ISO 14001 certifications has been modest in Kazakhstan. The introduction of other important certificates, such as ISO 26000 and SA 8000 social responsibility standards and ISO 5001 energy management standard, is rare.

Environmental auditing

Kazakhstan should consider how it can reform the use of environmental audits, environmental management systems and independent verification, in line with most OECD members' good practice for self-monitoring.

Environmental auditing is covered by the Environmental Code (as amended). If an enterprise reorganises or goes bankrupt, or an inspection discovers significant damage to the environment, it may be requested to do a mandatory audit. Environmental audit can also be undertaken voluntarily and, in such cases, its outcomes are confidential. There are no data on how many voluntary audits take place. It is estimated that fewer than 100 mandatory audits were undertaken in 2017 across the entire country.

The Committee on Environmental Regulation and Control issues licences for environmental audits, which are of unlimited duration. Both legal entities and individuals can be licensed. The Committee receives mandatory environmental audit reports, but it rarely comments on the reports received. According to the Code, environmental auditors (both legal entities and individual entrepreneurs) shall be part of a chamber of environmental auditors. Several such chambers exist.

Environmental auditing does not seem to prevent environmental violations and damage or give incentives for an enterprise to undertake a voluntary audit. A mandatory environmental audit takes place when the prescription to remediate the violation is already in place and the damage has already occurred. This audit practice does not motivate the enterprise to implement environmental protection measures. There is no formal system to check whether an enterprise has implemented measures prescribed by an imposed audit, and auditing is not used to plan environmental protection measures.

The European Union and OECD member countries use environmental auditing in two principle ways:

- Environmental authorities use regulatory audits to carry out in-depth investigation into poor performance and non-compliance. They also use them to determine the "root cause" of problems as opposed to looking at symptoms. In this way, they aim to help entities improve systems and management practice. This type of auditing could be equated with Kazakhstan's mandatory audits.
- Regulated companies use audits as part of business management. This can be as a result of implementing an environmental management system, or wider (e.g. integrated) management practice. Companies may employ third parties to independently verify their performance. In the case of an EMS, they use certification bodies to assess conformity with standards such as ISO 14001.

Companies do audits to improve management performance, or as a result of supply chain, to respond to contractual requirements.

Many countries have a system to accredit certification bodies to international standards for auditing (conformity assessment). The United Kingdom Accreditation Service is one example. In EU countries such as the United Kingdom and the Netherlands, environment agencies have evaluated the potential for company environmental management and audits to assure legal compliance, alongside reduced state inspection.

Better use of new technology and information, including digitalisation, artificial intelligence and remote sensing

Information technology (IT) is increasingly employed in permitting, compliance assistance, monitoring and reporting. Uses range from electronic submissions of permit applications and self-monitoring reports to databases of various complexity to interactive web-based tools. IT is both a key means of improving the efficiency of environmental enforcement authorities and an essential element of initiatives to reduce the administrative burden on the regulated community.

Information and data being generated and used by EU and OECD environmental agencies, and by the regulated community, include:

- state of the environment reports, focusing on the condition and pressures on the environment
- sector reports, focusing on the risks and impacts of the sector and its companies' performance in managing these risk and impacts, including compliance with permit and other requirements
- incident reports providing information on the types and severity of pollution incidents
- use of fines and penalties, looking at the effectiveness of enforcement
- information generated by environmental management systems such as audit findings and actions
- corporate and social responsibility reports
- environmental and compliance information in company annual accounts and reports.

The dissemination of compliance assistance information to the regulated community is getting more sophisticated. There is increasing emphasis on web-based tools such as Compliance Assistance Centres in the United States and NetRegs and Gov.uk in the United Kingdom. The expanding disclosure of compliance-related and general environmental information is thus making public pressure an important compliance incentive for businesses.

In a key trend, business organisations report on their environmental performance and get reports independently verified. This is being "mainstreamed" as governments and professional bodies such as the Institute of Chartered Accountants are requiring company accounts to cover environmental costs and liabilities. Two examples of good practice are set out in Box 3.6. They focus on bespoke environmental data management software products developed for commercial companies such as Viridor and Statoil.

Box 3.6. Examples of good practices in information technologies for compliance

OpenSpace web portal

OpenSpace is an interactive web page developed by Viridor (a resource and waste management company) with the Environment Agency. It enables users such as regulatory officers to view environmental compliance data via structured queries on any computer linked to the Internet. OpenSpace is the product of a four-year change programme within Viridor that has examined and changed every aspect of the way it schedules, obtains and processes environmental data. Viridor and its partner organisations have developed automated and standardised scheduling of environmental work across the UK waste and environmental industries. This has included the first database-scheduling link to a laboratory, as well as the use of personal digital assistant technology to obtain field data in a consistent and quality assured manner. All information visible within OpenSpace is underpinned by multiple layers of quality assurance. This aims to ensure the key data and associated management actions can be communicated in a timely and contemporary manner to the Environment Agency.

Emisoft and Statoil Management and Reporting System

In 1993, Emisoft was tasked by Statoil and Hydro, the two largest oil and gas companies in Norway, to design a system to keep track of their environmental performance. Statoil has focused on compliance, improving sustainability performance and continuously enhancing the efficiency of environmental accounting and reporting. For its part, Emisoft focused on developing a system that provides traceability and transparency, and ensures compliance.

In 2001, environmental authorities introduced zero discharge requirements for chemicals along the Norwegian continental shelf, a goal to be fulfilled by 2005. Statoil, Hydro and ConocoPhillips challenged Emisoft to develop a system to support a zero discharge strategy for chemical use. The zero discharge goal was met in 2005 and chemical discharges have been consistently lowered in subsequent years.

The EU Emissions Trading System includes requirements for submission of reports for all CO_2 emissions, third-party verification of the emission data and payment of CO_2 quotas. Statoil uses Emisoft's system to produce all the required reports and ensure they contain complete, accurate and valid data. The Emisoft system is used to manage Statoil's environmental performance throughout the organisation. Environmental data are managed in one common system. Data are accessed, updated and reviewed at site level and aggregated, monitored and reported on corporate level. Having access to quality data is fundamental for how Statoil conducts its business; carbon intensity is included in the company CEO's score card as a key performance indicator. Statoil uses information produced by the Emisoft management and reporting system to communicate its sustainability performance to stakeholders.

Source: (Foreman, J. (ed.), 2018[2]).

Notes

[1] See Chapter 13 of the Criminal Code, Articles 324 – 343, https://online.zakon.kz/Document/?doc_id=31575252#pos=4357;-75.

[2] Criminal Actions can occur when EPA or a state enforce against a company or person through a criminal action. Criminal actions are usually reserved for the most serious violations, those that are wilful, or 'knowingly' committed. A court conviction can result in fines or imprisonment. See https://www.epa.gov/enforcement/basic-information-enforcement.

[3] Logic modelling provides a representation of how an intervention is expected to work. It can be used to capture and describe assumptions and evidence used by those designing, applying and evaluating policies, goals or interventions. See (IMPEL, 2014[14]).

[4] See https://www.impel.eu/tools/risk-criteria-database-iram/.

[5] See (IMPEL, 2008[8]).

[6] See (IMPEL, 1999[15]).

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Chapter 4. What to do about monetary damages for industrial air pollutants?

Over the past few decades, Kazakhstan has been imposing compensation (monetary damages) for environmental damage (or damages to the environment) via the judicial system. These damages are allegedly caused by emissions into the air from stationary sources above the emission limit value.

The chapter compares Kazakhstan's underlying concepts and practices for liability provisions in case of environmental damage with the experience of OECD member countries. It reviews the legal framework, the assessment of environmental damage and the links between environmental liability and financial security. It then provides recommendations to streamline the system of environmental liability, thereby implementing more amply and effectively the Polluter-Pays Principle.

4.1. Introduction

The economic implications of weak environmental liability regimes are multiple and substantial. These include the need for public financing of environmental remediation, increased spending on public health, loss of competitiveness because of work force migration out of polluted areas and loss of ecosystem functions. Liability for environmental damage in most OECD member countries is understood as an obligation for the responsible party to bear the costs of restoring the environment to its pre-damaged state. Where such restoration is not possible, the value of the pecuniary compensation should be directed towards complementary or compensatory remedial measures. This obligation, under the strict liability regime primarily applied by OECD members, does not require proof of negligence or regulatory non-compliance. The party responsible for the damage under an administrative or court order usually conducts the remediation, in accordance with a specific clean-up project (OECD, 2012[1]).

4.2. Comparative analysis

4.2.1. Legal framework for environmental liability

In Kazakhstan

The system of environmental liability in Kazakhstan diverges substantially from OECD experience and practices. Environmental liability remains focused on estimating and obtaining monetary compensation for the state (essentially serving as a penalty), rather than on avoiding and rectifying the damage. Environmental damages do not arise upon a claimant bringing physical evidence of actual harm to a natural resource. The regulatory framework thus neither encourages nor facilitates the application of an environmental liability regime (UNECE, 2019[2]), as defined and applied by OECD members.

In theory, the framework foresees that competent authorities first assess the possibility of restoration after damage. It also envisions that the polluter will implement remediation measures (see Chapter 46 on Liability for Environmental Offences and Settlement of Ecological Disputes of the Environmental Code [as amended]).[1]

In practice, establishing actual harm to the environment is irrelevant to setting out environmental liability. Liability is related instead to the emission limit values (ELV) set in project documents and environmental permits. Exceeding the ELV becomes the basis for environmental liability (the fault-standard).

Direct or indirect methods are used to calculate monetary damages payable to the state. See Section 4.2.2 for more details.

The specific violations that trigger damages liability are set forth in Article 321(2) of the Environmental Code. It states that "Damage, inflicted to the environment, and to the civil health and property of individual and legal persons, is subject to compensation, as a result of:

1. destruction and damage of natural resources
2. unlawful and irrational use of natural resources
3. unauthorised emissions
4. over-standard emissions."

As a result, unauthorised emissions and above-limit emissions have historically constituted the grounds for most of the damages payments assessed each year against alleged polluters. This has been confirmed by interviews with professional associations (American Chamber of Commerce in Kazakhstan, 2018[3]).

In most cases, environmental damage is not remedied, despite the polluter being identified and paying for the damage done (UNECE, 2019[2]).

OECD member countries

Compensation for environmental damage is quite unusual among OECD members. It typically arises from lawsuits following unanticipated, severe and exceptional pollution events. Liability is understood as an obligation for the responsible party to bear the costs of restoring the environment. The policy objective is to restore the environment, which is reflected in specific requirements imposed by the law on liable parties. The objective is not to punish the operator that caused the damage (OECD, 2012[1]).

In other words, within the OECD, monetary pollution damages are not meant to punish an operator for breaching an emission limit or causing emissions not expressly authorised in a permit (OECD, 2012[1]). Rather, monetary pollution damages are intended to be restorative. Violation of laws (such as emission limit rules) is the domain of administrative penalties and criminal law.

In determining the features of a liability regime underpinning monetary damages, legislators must choose between a strict liability and a fault-based standard.

A strict liability standard forces the operator to consider both the level of care and the nature and level of activity. It creates additional incentives for good corporate environmental management, at least with respect to hazardous activities (OECD, 2012[1]).

A fault-based standard provides appropriate incentives to potential responsible parties. However, these incentives relate only to the level of care (the diligence in performing a given activity) and not to the nature and level of polluting activity (OECD, 2012[1]). Some European countries (e.g. Italy and Poland) historically used fault-based liability. However, they changed their systems to comply with the Environmental Liability Directive (ELD) (OECD, 2012[1]).

Strict environmental liability was first applied in the United States and gained ground in other OECD member countries. The EU ELD imposes the policy on operators engaged in dangerous activities listed in Annex III of the directive. ELD Annex III defines dangerous activities as those subject to an integrated permit, a water abstraction, wastewater discharge or a waste management permit, or a licence for handling dangerous substances and waste. However, a strict liability regime can be weakened by different mitigating factors. The ELD states that operators can, subject to national legislation, invoke two defences. The "permit defence" argues the harmful activity was legally permitted or licensed, and that the operator can prove compliance with all permit/licence conditions. The "state of the art defence" can be used to avoid liability. It aims to prove the harmful activity was not considered likely to cause the damage according to the state of contemporary scientific and technical knowledge.

The party responsible for the damage usually conducts remediation. This is done under an administrative or court order, in accordance with a specific clean-up project. In a public health or environmental emergency, public authorities can proceed directly with

remediation. Afterwards, they can recover remediation costs from the liable parties (OECD, 2012[1]).

Importantly, air pollution is not typically a basis for environmental damage in the OECD. Cases for damages to land and water for air emissions are rare. The environmental damages laws of OECD member countries thus tend not to be used for air pollution. The air cannot be remediated, and it is difficult to relate industrial air emissions to the harm of land, water or human health. As noted earlier, OECD jurisdictions impose a penalty, not monetary damages, on a resource user for exceeding a limit in a permit due to its own fault.

In Canada or Norway, cases in which a company was subjected to damages to land or water caused by emissions into the air could not be identified.

In the United States, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) includes air in its definition of natural resources damages. However, interviews with senior officials at the enforcing authority indicate that air pollution, while not expressly excluded, is clearly "outside the ambit" of natural resources damages under CERCLA and the Oil Production Act (OPA).[2]

In the European Union, air pollution is not, strictly speaking, a subject of damages liability as defined by the ELD. However, emissions to air that cause "environmental damage" can still have legal consequences. For example, if air emissions damage "land", then the operator will be liable for the costs of remediation/restoration of the land. However, **a causal link** has to be established in court.

- The ELD establishes an EU-wide common framework of environmental liability to prevent and remedy specific types of environmental damages (see Figure 4.1). The ELD covers three areas: i) "damage to protected species and natural habitats"; ii) "water damage"; and iii) "land damage." The term damage pervades all three categories. It is defined as a measurable adverse change in a natural resource or measurable impairment of a natural resource, which may occur directly or indirectly. Measurability is, therefore, a central determinant as to whether damage (as a matter of strict legal definition) has been caused. Scientific assessment will be required to determine if the relevant threshold has been met (Fogleman, 2006[4]).
- Air is absent from the definition of "environmental damage" under art 2(1) of the ELD. The European Commission has been asked to reconsider this absence in light of the harm caused by air pollution to human health and the environment (European Parliament, 2017[5]). The case of Túrkevei Tejtermelő Kft. v Országos Környezetvédelmi és Természetvédelmi Főfelügyelőség confirmed that "air pollution does not in itself constitute environmental damage covered by Directive 2004/35" (European Court of Justice, 2017[6]). Through analogy, flaring in excess of the limits of a permit, in itself, would not fall with the ELD's definition of environmental damage.

However, recital four of the ELD is particularly pertinent. It asserts that environmental damage, "also includes damage caused by airborne elements as far as they cause damage to water, land or protected species or natural habitats." Thus, the framework of environmental liability to be implemented by member states is relevant where water, land, protected species or natural habitats are damaged by emissions to air from, for instance, a flaring stack.

The competent authority has to present evidence that air pollution had caused such damage before it can consider making the relevant operator take remedial measures. Where this can

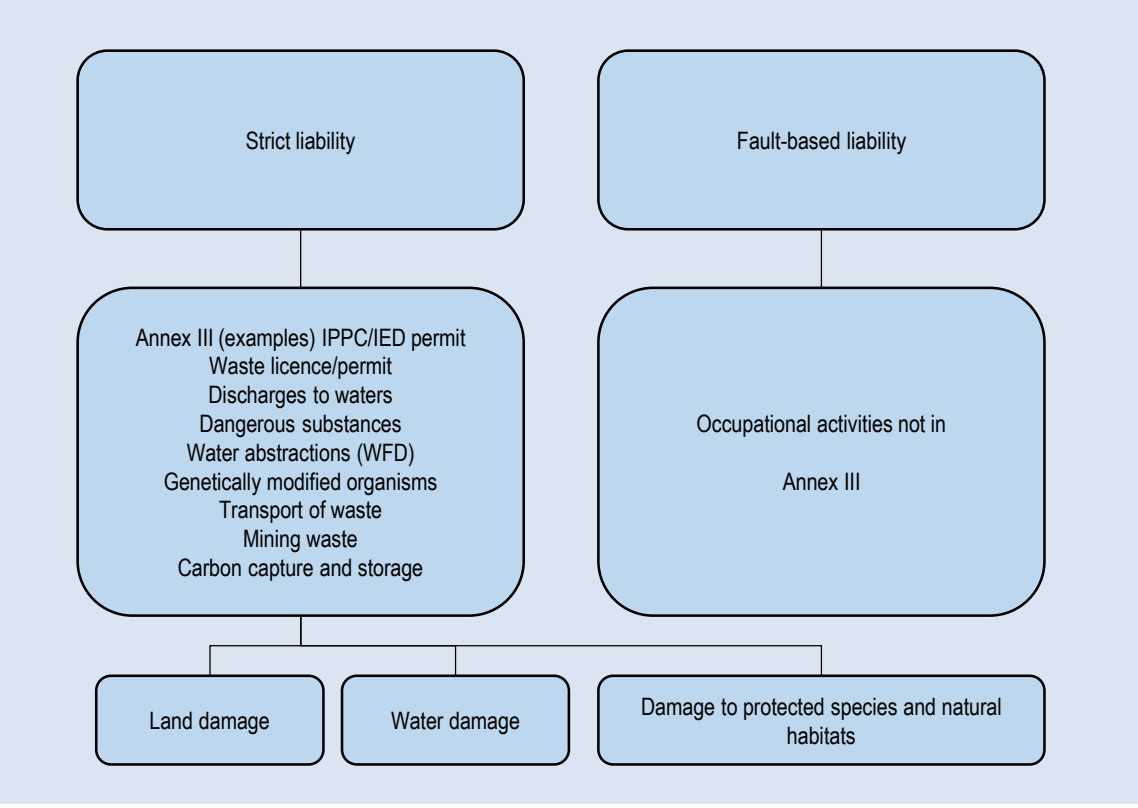
be done, the pollution would come within the scope of the ELD. If not, relevant national law rather than the ELD would apply.

It may be more difficult to invoke the ELD in circumstances where the pollution is of a widespread, diffuse character. Diffuse pollution is generally understood to encompass, "[p]ollution from widespread activities with no one discrete source, e.g. acid rain".

Diffuse emissions to air can occur from various scattered sources such as road transport, shipping, aviation, domestic heating, agriculture and small business. While pollution from individual diffuse sources may not be of particular concern, the combination of diffuse sources of pollution can have an environmental impact.

The ELD only applies to damage caused by pollution of a diffuse kind where it is possible to establish **a causal link** between the damage and the activities of individual operators. There is important case law from the Court of Justice of the European Union, which helps competent authorities to establish that link.

Figure 4.1. Examples of environmental liabilities and changes



Note: IPP/IED = International Plan Protection Convention / Industrial Emission Directive; WFD: Water Framework Directive
Source: (European Commission, 2013[7]).

Environmental damage can be identified through a variety of means. In addition to regular site inspections by an environmental enforcement authority, information may be obtained from accident notifications from operators, routine self-monitoring reports, environmental quality monitoring data or citizens' complaints. The identification of contaminated sites

with historic damage can take place during an application for a building or operation permit or a transfer of ownership of the site (OECD, 2012[1]).

An initial investigation evaluates the extent of damage. For example, Lithuania uses a two-step approach divided into a preliminary investigation (impact assessment) and a detailed investigation to determine the significance of the environmental damage.

Most EU countries have no general criteria of the severity threshold. Competent authorities use professional judgement to determine the significance of the damage on a case-by-case basis.

In the United States, formal site scoring uses the country's criteria and scoring procedures set forth in the hazardous ranking system. Among the criteria applied are toxicity of substances, location of potential receptors, exposure pathways, threats to human food chain and the environment. Sites with a score above a certain threshold are put on the National Priorities List.

4.2.2. Assessment of environmental damage

In Kazakhstan

What and when

Article 108(1) of the Environmental Code states that the economic assessment of damage caused to the environment means *"*monetary value of the expenditure, required to restore the environment and consumer properties of natural resources".

As mentioned previously, environmental damages are triggered by exceeding a limit set in the permit, not a proven actual harm to the environment contrary to the case in OECD member countries.

The level of compensation for the damage is estimated and charged to the polluter. Article 322(6) of the Environmental Code (as amended) states that, "(t)he recovered amount of compensation of harm shall be transferred to the state budget, and in the established cases by the legislation of the Republic of Kazakhstan – to injured person.[3]

The competent authority (CERC officials), within one month from the date of establishing the fact of a damage to the environment, collect and analyse necessary materials and assess the economic damage.

The direct/indirect method

An economic assessment of environmental damage can be carried out directly or indirectly. The choice depends on whether the complete elimination of the damage is possible through environmental remediation.

The direct method of economic assessment of damage consists in determining the actual costs necessary for restoring the environment; replenishing degraded natural resources; and healing living organisms. In each case, the work would use the most efficient engineering, organisational, technical and technological measures.

Competent authorities primarily consider how the party that has caused damage can restore the environment. The letter of guarantee of the party that has caused damage to the environment sets out relevant obligations for these restorative actions. It indicates specific measures and dates for implementation.

The cost of mitigation measures is supposed to be determined by their market value. In the economic assessment of damage by a direct method, officials of the competent authorities may involve independent experts. Environmental auditors, as well as specialists from design, engineering and scientific organisations can act as experts. The person who has damaged the environment pays for the work of independent experts.

The Environmental Code establishes the priority of the direct over the indirect method. In principle, the indirect method is used when the direct method cannot be applied. However, in practice, the use and the priority given the direct method are purely declarative. In the overwhelming majority of cases, the competent authority is "forced" to use the indirect method. In fact, the direct method cannot be used, since there is often no physical evidence of harm linked to an industrial air emission. Unlike the practice in OECD member countries, an indirect method is easier to apply and usually results in much higher monetary damages. Indirect damages were thus the largest component of the 2013 flaring fines (USD 740 million) according to interviews with operators.

Kazakhstan triggers the calculation of monetary compensation for damages to the environment. This occurs when a limit in a permit is exceeded or a pollutant is emitted into the environment on a day or in a circumstance that is unauthorised. This is the case even if the same facility emits far greater amounts of the same pollutant but under authorised circumstances. An example of such unauthorised emission is a malfunction that leads to a need for a gas flaring for less than a day. Although there is no evidence of harm, the state assesses damages; it must, since emissions exceeded the permit limit or the flare was unauthorised.

The indirect calculation formula is theoretical. It has even been negotiated over the years, while it was supposed to ensure a 'scientific' determination of damage, and the related monetary compensation. The actual formula is in the Government Resolution №2 535. [4]

- The damage is a function of the pollution charge rates. By design, the formula is thus discriminatory, since pollution charge rates differ for the flaring of gas from other emissions from stationary sources. It is directly proportionate to the mass of pollutants emitted in excess of the permitted limit and the charge rate for that pollutant.
- The rationale behind the formula, as communicated by the Ministry of Energy, is that "(t)he excess of actual volumes of emissions over the established standards is determined by instrumental measurement or by calculation in accordance with the methodology for determining emission standards to the environment […]. Conversion of the actual mass of the pollutant into conventional tonnes is carried out by multiplying its mass in tonnes by the hazard coefficient '(Ai)' equal to 1/MPC ('maximum permitted concentration') of the substance."
- The competent authorities determine the level of environmental hazard caused by the violation of environmental legislation, as well as environmental risk, based on criteria specified in the rules for the economic assessment of damage from environmental pollution.[5]

The indirect method is thus controversial for a variety of reasons. First, the damages paid by resource users need not be used for environmental purposes. Typically, they are not aimed at correcting the environmental damage caused, limiting its impacts or preventing further damage. Payments received from resource users raise revenue for regional or local budgets. Second, they result in the discriminatory treatment of foreign investors. As payments are established based on the tax rates, payments for gas flaring are higher than

those from other stationary sources; major oil and gas companies pay hundreds of millions of dollars in compensation under the indirect method (OECD, 2017[8]). Third, the formula increases the costs of investing and doing business in Kazakhstan in an arbitrary and unpredictable way; resource users may pay substantial sums. The oil and gas sector perceives the payments required by the Kazakh authorities as significantly higher than gas flaring payments in OECD member countries (OECD, 2017[8]).

The missing reference to equivalency analysis

The Code itself has omissions compared to legislative acts in OECD member countries. It provides for two means of assessing economic damage: the direct and indirect methods, which are detailed in articles 109 and 110. Neither of these methods necessitate an **equivalency analysis** to be undertaken, as it is for instance refer in the EU ELD.

Indeed, the Environmental Code does not specify complementary and compensatory remediation. This means that equivalency analysis can play no role in determining the appropriate remediation measures for resource users.

These are important omissions from a framework of environmental liability. They mean that liability imposed upon a resource user, as determined by the direct and indirect methods, will not reflect the true level of loss to the environment and society caused by the environmental damage. For instance, the framework cannot address interim losses.

Article 109, which deals with the **direct method**, is focused solely upon determination of the financial cost associated with primary remediation.

- More specifically, articles 109(1) and (3) provide that the direct method of economic damage assessment is to determine the market value of the "actual costs" associated with restoring the environment, "through the most effective engineering, organisational, technical and technological measures."
- Formulated as such, the direct method does closely resemble the idea of payment for damage by the person damaging the environment (i.e. the polluter) under common conceptions of the Polluter-Pays Principle in OECD countries, particularly within the European Union.
- Article 109(1), however, does not sit comfortably with Article 108(3), which asserts that the direct and indirect methods are used for the economic assessment of damage to the environment. Reading those provisions together, it appears only the costs of primary remediation are to be equated with the economic value of the damage under the direct method. The associated benefits are not relevant (i.e. the wider benefits associated with the natural resources that were lost – the services provided by those resources).

Article 110(1) deals with the **indirect method** of economic damage assessment. This is where the approaches of Kazakhstan and OECD member countries vastly diverge.

- Article 110(1) asserts that the indirect method is to be used in cases, "when the direct method of economic damage assessment cannot be applied".
- Article 110(2) outlines that "(e)conomic damage assessment shall be determined by the types of impact on the environment by adding the damage assessment for each ingredient by an indirect method".
- The indirect method determines the value of the "pollution damage" as a function of the pollution tax rates. It further determines the "pollution damage" from each

pollutant using a mathematical formula. It then combines the resulting assessments of damage caused by each pollutant. However, it does not require measurements (or proof) of actual damage to the environment in determining the amount of required compensation. Nor does the lack of such evidence provide a defence for the resource user.

The very notion of environmental damage

There is also imprecision and inconsistency over how environmental damage or "damage caused to the environment" are defined under the Environmental Code (as amended).

There is reference to damage caused to natural resources. Article 5 sets out the basic principles of the environmental legislation of Kazakhstan, including "mandatory compensation for damage caused to the environment". Article 321(4) provides that, "[t]he compensation for damage, inflicted to environment by the virtue of breach of environmental legislation […] shall be carried out voluntarily or by the court decision on the basis of economic assessment of the damage, the procedure of conduct of which shall be determined in accordance with this Code".[6]

However, there is no substantive reference to **damage to the services performed by a natural resource** for the benefit of another natural resource (or natural resources) or the public.

Clear definitions of damage "inflicted to the environment" and "damage caused to the environment" are needed under the Code for the effective operation of Articles 5(7) and 321(4).

Under Article 1(42), the term "environmental damage" is defined as "pollution of the environment or the harvesting of natural resources over the established limits, causing or inducing the degradation and depletion of natural resources, or the death of living organisms".

However, that term is not used in the Code, which deals with economic damage assessment, specifically Articles 108-110. Rather, the phrase "damage to the environment" is used. Article 1(41) defines the term "environment" as "a set of natural and cultural objects, including open air, the ozone layer of the Earth, surface and underground water, land, minerals, flora and fauna, as well as the climate in their interaction". And Article 1(48) defines "pollution of environment" as "entry of polluting substances, radioactive materials, waste production and consumption into the environment".

OECD member countries

In OECD member countries, where a polluter's activities have caused damage to the environment, the polluter may be required to: i) remediate the environment; and ii) compensate the public for the natural resources/services which were lost during the period in which the environment was impaired (Lipton et al., 2018[9]).

This compensation is resource- or service-based, not monetary per se. Competent authorities use a process termed "equivalency analysis" to determine: i) the type and amount of natural resources and services lost over time as a result of the damage and; ii) the type and amount of complementary and compensatory remediation actions needed to offset that loss.

It seeks to ensure that polluters neither under-compensate nor over-compensate for losses. In this way, it facilitates respect for the Polluter-Pays Principle as understood and applied in frameworks of environmental liability in OECD member countries.

The focus is upon complementary and/or compensatory remediation; equivalency analysis does not seek to determine what primary remediation should be undertaken (Lipton et al., 2018[9]). That said, quantifying the benefits of primary remediation with a view to determining any residual damage ripe for complementary and/or compensatory remediation is a key input into an equivalency analysis.

According to the ELD, for example, environmental damage **to water or protected species or natural habitats** can be assessed with regard to primary, complementary and compensatory remediation in the European Union.

- **Primary remediation** entails actions to reduce or remediate site-specific damage, usually through removal of released polluting substances or actions to reduce their ongoing discharge. It aims at returning the damaged natural resources or services to their pre-incident, or baseline, condition. However, this may not always be possible.
- **Complementary remediation** may be needed. This can occur at the site of the incident by improving or creating alternative resources or services (to the damaged ones). It could also take place at an alternative site by improving natural resources/services of the same or comparable kind, if full on-site remediation is impossible.
- It takes time to remediate the impacted natural resources and services to the baseline condition. Therefore, **compensatory remediation** is needed from the time the damage occurred until recovery to baseline conditions ("interim losses of services provided by the natural resource"). However, the practical implementation of compensatory remediation is still rare. In Germany, procedures for measuring interim losses with economic methods exist, but have not yet been applied in practice. Nevertheless, this is often done implicitly by the experts when defining adequate compensation measures.

Any significant risk of human health being adversely affected is to be removed. The competent authority can decide that no further remedial measures are needed if the cost of these remedial measures to reach baseline condition (or similar level) would be disproportionate to the expected environmental benefits. The reasonable remedial options should reflect the best available techniques.

However, in the case of **land damage in the European Union**, the framework of primary, complementary and compensatory remediation measures does not apply. Remediation of damage to land is to comprise measures necessary to ensure, as a minimum, that the relevant contaminants are removed, controlled, contained or diminished. In this way, the contaminated land, taking account of its current use or approved future use at the time of the damage, would no longer pose any significant risk of adversely affecting human health (Fogleman, 2015[10]). The presence of such risks shall be assessed through risk-assessment procedures. These should consider the characteristic and function of the soil, the type and concentration of the harmful substances, preparations, organisms or micro-organisms, their risk and the possibility of their dispersion. A natural recovery option (i.e. where there is no direct human intervention) could be deemed acceptable. The framework of primary, complementary and compensatory measures does not apply to land damage cases. Therefore, interim losses are not to be considered when selecting the most appropriate

measure(s) to remediate land damage (Brans, 2006[11]). Thus, whether natural resources and services have been impaired during restoration is irrelevant. The operator is, therefore, relieved of liability for interim losses where their activities have only damaged land (that is not a protected habitat and is governed by the ELD).

Importantly, compensation for environmental damages has no links with "the state budget funds". Such compensation are not funds to be collected. In OECD jurisdictions, polluters do not pay cash compensations to the state for loss of a natural resource. These compensations are irrelevant to the state revenues and as such should not appear in the reporting of ERT.[7]

The party responsible for the damage conducts remediation under an administrative or court order, in accordance with specific clean-up and restoration project conditions. In cases of public health or environmental emergency, non-compliance with remediation orders or uncertainty about responsible parties, public authorities in most OECD member countries can proceed directly with remediation. Afterwards, they can use civil liability provisions to recover remediation costs from liable parties. The competent government authority always evaluates results of remediation projects (OECD, 2012[1]).

The obligation of polluters to pay for their damage to the environment forces them to fully internalise the negative externalities of their activity. However, the biggest challenge of the resource equivalency analysis is estimation of the degree of loss associated with the environmental harm (and, similarly, of the benefit from remediation) (OECD, 2012[1]). This is even more difficult in the case of damage caused by industrial air pollution.

Many OECD members struggle with this challenge. A consensus has emerged on two general approaches to calculate the amount of required damage compensation. The first determines the monetary value of the damage. The second assesses the adequate scale of environmental remediation needed to compensate (in real rather than monetary terms) for the harm, with the subsequent determination of the respective costs (OECD, 2012[1]). The remediation scope may be mandated by law or left to the discretion of the competent authority. This authority determines specific measures using criteria such as technical feasibility, effectiveness and efficiency. The significance of the damage has to be assessed with reference to the baseline condition of the environmental media or ecosystems concerned. The ELD defines this baseline as "the condition that would have existed had the environmental damage not occurred, estimated on the basis of the best information available" (OECD, 2012[1]).

The key to equivalency analysis is determining a unit of measure of damage that can describe losses over time and can be matched to the benefits of remediation over time. The quantification of damage (or benefit) can be expressed in several ways. These include monetary units, area of required remediation, number of individual organisms that must be replaced (such as fish or birds) or units of recreational use, such as user days that must be replaced to compensate for the loss of recreational use. Common practice includes using a single attribute of the natural resource or environmental service. Examples of single-attribute metrics include measures of vegetation or organism density, biomass and counts of individuals lost. The metric used should be the same attribute on the loss and gain sides of the equation (OECD, 2012[1])

There is no single objective standard for determining the metric. Considerations include type of damage (e.g. physical or chemical) and scale of damage (e.g. area, timing, anticipated duration). The most important consideration is the nature of the remediation available for compensation, since the same metric must be used to estimate the scope of the

remediation. An appropriate metric is usually selected in close consultation with biologists, ecologists or other relevant environmental scientists (OECD, 2012[1]).

Annex D provides a more comprehensive analysis of the three main equivalency analysis methods: service-to-service, resource-to-resource and value equivalency.

The equivalency analysis is merely one step in deciding how remediation ought to proceed after damage has occurred. Relevant stakeholders may wish to consider site and incident-specific factors to help determine the level of remediation required to offset the damage (Lipton et al., 2018[9]).

4.2.3. Environmental liability and financial security

In Kazakhstan

When a polluter is unable to bear the financial costs associated with its environmental obligations (for example, as determined by the "direct" method of damage assessment under the Environmental Code), there are two possible outcomes. First, the environment may remain un-remediated following a decision by the relevant regulator that the works will not be carried out at public cost; society pays metaphorically, through the need for it to inhabit a lower quality environment. Second, the state will be required to pay from its own resources; society pays financially, through reduced levels of state funds available to fund public services. Neither accords with the policy objectives of the Polluter-Pays Principle.

The introduction of a system of mandatory financial security in Kazakhstan started with the 2005 Law on Mandatory Environmental Insurance (UNECE, 2019[2]). Article 107 of the Kazakh Environmental Code (as amended)[8] does refer to mandatory insurance. Entities carrying out environmentally hazardous economic and other activities are required to have environmental insurance. The law foresees the government determining the list of environmentally hazardous types of economic and other activities. According to the information collected during the most recent Environment Performance Review, this specific list for the purpose of environmental insurance was not approved (UNECE, 2019[2]). Operators of category I activities are considered to fall within the scope of the mandatory environmental insurance. However, there are insufficient data to draw reliable conclusions on the effectiveness of this insurance in terms of the actual remediation of environmental damage (UNECE, 2019[2]).

Further to this, businesses comply with the obligation to purchase environmental insurance. However, they do not ask for insurance benefits in cases when insurance events occur. According to EnergyProm, environmental insurance business is the most profitable of all mandatory insurance types in Kazakhstan. In 2017, environmental insurance benefit payments were 0.04% of total benefit payments for mandatory insurance, while insurance premiums exceeded benefit payments by 106 times (UNECE, 2019[2]). And insurance may not provide a solution where breaches of environmental law have been intentional. The insurer may refuse the coverage.

Other means of financial provision (e.g. bonds, trust funds) are not covered by the Environmental Code (as amended) and some legislative acts on environmental issues.

OECD member countries

Financial provision has long been a requirement in international conventions concerning marine oil pollution and nuclear facilities. It is common in the EU environmental law in

relation to coverage of costs associated with environmental obligations under a permit. These are, of course, known foreseen obligations as contrasted with those arising by chance following a pollution incident. There is thus greater political will to impose mandatory regimes where obligations are certain to arise. In many OECD member countries, this political will dissipates when the obligations are a fortuity.

Despite its remedial and preventive potential, financial provision is not a requirement for operators in the main frameworks in OECD members. In the ELD, the principal environmental liability framework under EU law, there is no requirement for mandatory financial provision for liabilities arising under that regime. Only a handful of member states (Bulgaria, the Czech Republic, Portugal, Slovakia and Spain) have introduced mandatory financial provision regimes in their national laws.

The primary benefit of financial provision is its capacity to facilitate remediation/clean-up at the private cost of the resource user(s). Financial provision also exhibits significant regulatory potential to motivate operators to reduce their environmental risk, this being defined as the probability that their activities will cause environmental damage (Mackie, 2014[12]).

This potential may arise in a variety of forms. Broadly, it presents itself through the contractual governance of the resource user's behaviour (e.g. under the terms and conditions of an insurance policy) and the provision of economic incentives to improve safety levels and/or its financial strength.

There are five main ways in which financial provision may be made. First, monies or assets may be *set aside* with a third-party, such as a bank or a trustee, in favour of the competent authority (e.g. escrow accounts and trust funds). Second, a resource user (or, in theory, a company associated with it) may grant the competent authority a *charge* of a valuable asset, such as real estate, in their ownership. Third, *risk may be transferred* to a third party, such as an insurer or bank, in return for a premium, fee or charge (e.g. insurance, bank guarantees and surety bonds). Fourth, the *financial strength* of the resource user or a company associated with it (i.e. its parent company or another group company) may be tested and accepted as evidence of financial provision in and of itself (e.g. self-insurance and parent company guarantees). Finally, the resource user, alongside other resource users, could be required to contribute to a *compensation fund* or other industry fund. All these options are further examined in Annex E).

The competent authority may enable these five categories of measures to be used individually or in *combination*. Thus, the resource user (or a company or companies affiliated to them) could use more than one measure to evidence capacity to meet their environmental obligations. This would reduce the risks associated with any single category. Insurance has proven to be the most popular instrument to cover environmental liability under the ELD, followed by bank guarantees, funds and bonds (see paragraph 4.1.1. of the report to the Council) (European Commission, 2010[13]).

4.3. Proposed recommendations

4.3.1. Eliminate any form of fault-based damages (e.g. liability arising from unauthorised emissions or exceeding a limit in an IEP) and discrimination

As previously set out, the application of financial "damages" as payments for non-compliant activity, regardless of environmental damage, is not consistent with an OECD/EU framework. This is true both in terms of applying sanctions for non-compliance,

and in terms of liability for and remediation of environmental damages. The 2012 EECCA Damages Report describes this approach as "fault-based damages" (OECD, 2012[1]).

A system closer to OECD acquis should thus have three qualities. First, it should ensure physical evidence of actual harm to the environment. Second, it should ensure the assessment, and hence any calculations employed in that assessment, intends to determine replacement or remediation costs. Third, damages must be used only for restoration/remediation of the damaged resource or its replacement in an adjacent site, or reimbursement for the costs of the assessment or funding of a lost public service during restoration.

As in OECD member countries, monetary damages should be assessed. They should be used to restore the specific natural resource that the polluter was proven to have damaged to its condition before the pollution, or to restore the resource at an alternative site to an equivalent level.

A system closer to the experience of OECD members would consider pure monetary compensation for environmental damage as inconsistent with OECD standards. As mentioned previously, monetary pollution damages are meant to be restorative rather than to act as a form of punishment. Violation of laws (such as emission limit rules) is the domain of administrative penalties and criminal law.

A new system of damages would thus do the following:

- Eliminate the indirect method of calculating damages.
- Revoke the use of a direct method that is applied to fault-based damages. It should transition to the use of equivalency analysis to assess damages (see section 4.3.3).
- Reject the idea that liability for damages arise from exceeding maximum permissible concentrations (EQS) of pollutants in the environment and maximum permissible limits (ELV) in emissions permits. As in OECD member countries, EQS and ELV should play no role in liability for environmental damages.
- Ensure a joint order of the Prosecutor General and the Minister of Energy sets forth detailed criteria. These should identify types of evidence that suggest the presence of criminal intent and types of events that clearly exclude the element of intent. This is outlined in section 3.3.3.

The system of depositing monetary damages compensation into the state budget should be eliminated. Similarly, damages should not be put in an environmental remediation fund, as outlined in section 2.3.5.

Several recommendations revolve around the highly punitive and contested approach the government has adopted for damages (and penalties) for gas flaring. As mentioned in OECD (2017[8]), "the use of multiplied taxes and the indirect method for calculating monetary damages, with their focus on revenue raising, makes it impossible to gauge reliably the relation between pollution payments and marginal pollution reduction costs. A particularly acute illustration […] relates to [...] damages from gas flaring at upstream oil and gas facilities". More should be done to adjust the system of damages (and penalties) with regulatory approaches used in OECD jurisdictions. All technical issues and guidance on gas flaring should be part of wider guidance on best available techniques for oil and gas production. These would serve as a basis for clear principles and regulations on flaring and permit conditions. Box 4.1 provides guidelines gained from the experience of OECD member countries.

Box 4.1. Specific guidance on damages for gas flaring

1. Most countries surveyed by the World Bank and its Global Gas Flaring Reduction Partnership opted for a more performance-based approach to flaring and venting reductions. While this approach still requires strict enforcement, it emphasises consensus and co-operation between the industry and the regulator in setting objectives and targets. Most countries have thus moved away from a highly prescriptive regulatory system. Such systems use specific and detailed regulations to give clear direction on regulatory processes and procedures, set expectations of operators, and provide incentives for compliance through strict enforcement (BSEE, 2017[14]).

2. The 2017 Law on Subsoil and Subsoil Use allowed for technologically unpreventable flaring under specified conditions and authorised by the Ministry of Energy. However, to converge further towards an OECD benchmark, Kazakhstan cannot use a fault-based approach to establish environmental damage. This is particularly true in the case of unplanned flaring or flaring that technology cannot prevent. In these cases, a fault-based approach automatically imposes a penalty in the scenario of breach of limits on duration, volume or ELV. Nor should Kazakhstan impose limits on the duration of unplanned sour and acid gas flaring that are more stringent than the OECD benchmark. In most OECD members, regulatory programmes define the duration of unplanned flaring, not as an absolute limit, but rather as a threshold for requiring a permit. No permit is required for unplanned flaring for durations less than the specified time periods. For longer periods, flaring may be allowed subject to a permit or other authorisation. In Kazakhstan, breaching those limits or flaring within the limits in an unplanned and technologically unavoidable flaring scenario, results automatically in damages (and penalties). And these damages are established using the indirect formula, not based on evidence of actual damage to the environment. However, even a direct method of calculating damages would be inconsistent with OECD standards if damages liability was connected to unauthorised or above-limit emissions.

3. Finally, flaring regulations also incorporate the concept of "assimilative capacity" in OECD jurisdictions. In this concept, air can receive and assimilate a certain mass of emissions with no environmental damage. Again, environmental damages and compensations can thus only be claimed if an act of pollution has caused harm or injury to others or to a natural resource. Flaring regulations establish limits on the duration and volume of flaring. These aim to prevent exceedances of air quality criteria at prescribed locations. Air dispersion modelling can be used to analyse whether gas flaring has exceeded air quality criteria. However, exceeding emissions limits is a question of administrative liability. In this case, the consequence – without clear evidence that the air pollution has directly caused harm to land or water and subject to the pyramid approach – would be penalties, not damages. This is extremely rare in OECD countries and non-existent in OECD countries in relation to non-continuous gas flaring at upstream oil and gas production facilities.

Source: Author's elaboration based on interviews and desk research.

4.3.2. Define further environmental damage

An essential component of the effective functioning of any framework of environmental liability is a clear and legally robust definition of "environmental damage" (or analogous variants, such as "damage to the environment" or "harm to the environment"). There is imprecision and inconsistency over how environmental damage is defined under the Environmental Code (as amended).

Kazakhstan should thus:

- Define environmental damage more fully, referring to that definition more consistently throughout the relevant provisions of the Environmental Code, and using the EU ELD as a basis.
- Provide guidance on the threshold of damage necessary to render the relevant resource user liable for remediation costs (e.g. specific determinants of the significance of the damage).
- Incorporate damage to the services provided by natural resources for other natural resources and the public in the definition of environment damage. This prevents problems when assessing the level of damage to the environment caused by a resource user and, ultimately, determining the appropriate level of compensation due from them. The polluter will not pay to remedy the full extent of the damage caused.

Relatedly, Kazakhstan could also follow the approach adopted under the ELD that presumes a *causal link* between operators and pollution based on proximity of installations to the polluted area. The competent authority must have plausible evidence to justify its presumption. This could include, for example, the close proximity of the operator's installation to the pollution, and a correlation between the pollutants identified and the substances used by the operator in connection with its activities. Where the competent authority has such evidence then it could, and should, establish the requisite causal link between the operators' activities and the (diffuse) pollution.

Operators, of course, should be able to attempt to rebut the presumption that their activities have caused any damage through adducing relevant evidence.

4.3.3. Move towards equivalency analysis to assess damages instead of the indirect method

While the Environmental Code deals with primary remediation, it has no explicit reference to either complementary or compensatory remediation. This is an important omission as it substantially weakens the ability of the government to implement the Polluter-Pays Principle fully and effectively. Kazakhstan should thus consider the introduction of such a reference. This would create an opportunity for equivalency analysis to become part of Natural Resource Damage Assessment in Kazakhstan, building on the experience of OECD members.

Three types of remediation should be considered in the case of environmental damage, where possible (Bullock and O'Shea, 2016[15]). First, **primary remediation** should restore a damaged resource or impaired service to its baseline condition. Second, **complementary remediation** should be used when a site cannot be fully restored through primary remediation. It should also be considered when remediation involves intervention or improvements to habitat at another site that is physically or geographically linked in terms

of species/habitats or human interactions. Third, **compensatory remediation** should be considered in cases of interim losses before ecological functions can be fully restored or replaced (i.e. compensation/reimbursement for the service that the natural resource provided).

4.3.4. Reserve power to bring lawsuits in the public interest to state authorities

Kazakhstani citizens should retain the right to bring individual or collective damages lawsuits for harm to their health or property under the Civil Code. However, citizens should not substitute for the state and bring damages lawsuits in the public interest. Hence, as in the European Union's ELD and in the United States' CERCLA and OPA, citizens should not have the right to bring environmental damages claims for harm to public natural resources. Citizens should ensure that competent authorities take all necessary enforcement actions.

4.3.5. Strengthen the requirements for operators to make financial provisions

Requirements for high-risk resource users to make financial provision for their environmental liabilities should be introduced. These should ensure that an ecosystem does not remain un-remediated and that the state does not have to pay from its own budget, in line with the important policy objectives driving the Polluter-Pays Principle.

An operator (or a party related to them, such as a parent company or other group company) should indeed make financial provision in certain cases. Specifically, it should occur where operators or parties provide and maintain evidence that they have made provision for environmental obligations to which the resource may (i.e. following an industrial accident) or will (i.e. under the terms of their permit) become subject. This would take the form of a certificate or other documentation. This could, depending upon the particular obligation under consideration, comprise measures such as insurance, a bank guarantee, a bond or a cash deposit with the competent authorities. It should also include contributions to an industry fund in a non-discriminatory way, in particular with foreign-owned operators.

Competent authorities may assess the provision offered by a resource user by whether it is secure, sufficient and available. The funds represented by the measure(s) should be secure in the event of the resource user's bankruptcy. This means that funds or assets used for the provision are ring-fenced and not rendered available to the general body of creditors. The funds should be sufficient to cover the costs of a third-party undertaking the requisite (but outstanding) works. Finally, the funds should be available when required. This means that there is a ready source of funds for the requisite works when needed (EPA, 2015[16]).

Notes

[1] See http://adilet.zan.kz/eng/docs/K070000212_.

[2]Interview with the Senior Solicitor of the Office of the Solicitor, Environmental Restoration Branch, of the US Department of the Interior, responsible for enforcing CERCLA (American Chamber of Commerce in Kazakhstan, 2018[3]).

[3] See http://adilet.zan.kz/eng/docs/K070000212_.

[4] "Rules for the economic assessment of damage from environmental pollution" approved by the government of the Republic of Kazakhstan dated 27 June 2007 N 535 (with amendments and additions as of 21 June 2016): http://adilet.zan.kz/rus/docs/P070000535_.

[5] Ibid.

[6] This is confirmed by Article 16(7), which asserts that the government of Kazakhstan, in the scope of environment protection and natural management, is to approve "rules for economic evaluation of damage from environmental pollution". Under Article 95(7), "economic assessment of the damage caused to the environment" is recognised by the Code as a type of "economic regulation mechanism for environment protection and natural management". See http://adilet.zan.kz/eng/docs/K070000212_.

[7] See Figure 6 (OECD, 2017[17]).

[8] See http://adilet.zan.kz/eng/docs/K070000212_.

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Chapter 5. Conclusions and ways forward

This chapter considers a number of cross-cutting issues that will underpin successful implementation of the reforms of the industrial air pollutants environmental regulatory system. These largely concern the requirements needed for further planning, behavioural changes in enforcement practices, and collection of comparable quantitative and qualitative data that are internationally accepted. These issues are most relevant for impactful and lasting reforms, however well-designed they might be in line with OECD benchmark and how fast legislative acts might be enacted. The chapter also points out to areas where the OECD and Kazakhstan can further enhance their mutually rewarding co-operation to address these challenges.

5.1. Introduction

Much of this report is oriented towards providing Kazakhstan with the methods and practices of OECD member countries to support the active pursuit of policies. Ultimately, this will lead to faster and better adoption of best available techniques (BAT), lower the cost of doing business and attract more foreign knowledge and investments.

Many policy actions are focused on reform of the environmental payments for industrial air pollutants. These actions need to be prioritised, and the right framework conditions for implementation must also be in place. Several components of well-enforced environmental regulations in OECD member countries are still missing in Kazakhstan. These include effective capacity building in the Ministry of Energy and in the oblasts, a robust data system, better engagement and co-operation with all stakeholders, and reliable monitoring and evaluation. Making strides with respect to these building blocks will strengthen the social acceptance of better regulation – modernised policies and laws that achieve their objectives at minimum cost – and enhance the attractiveness of Kazakhstan's economy and the well-being of its citizens.

5.2. Deepening the implementation plans at sectoral level

Kazakhstan is making efforts to understand some of the main concepts of modern environmental regulations, such as developing amendments to the Environmental Code. While this report focuses on environmental payments, reforms of these areas in isolation will clearly have limited success to adopt a system in line with the Polluter-Pays Principle. Authorities in Kazakhstan must understand how the elements of the OECD environmental regulatory framework are linked and inter-dependent. Only in this way can it address industrial pollution specifically and environmental challenges at large. In many OECD member countries, the experience of modernising environmental regulation demonstrated that the soft areas of education, engagement and enabling approaches are key to successful outcomes (e.g. better compliance). Enforcement of penalties is considered a last resort.

Effective implementation of structural reforms in environmental regulations is one of the most challenging undertakings both for OECD partner countries and for some of the most advanced OECD economies. Implementation is much more difficult than designing and adopting many reforms. More often than not, first-best policy recommendations fall short of delivering desired outcomes for several reasons. These reasons include limited administrative capacity, fragmentation and complexity of governance frameworks, inadequate decision-making structures, and poor processes and organisational culture.

An overall implementation and transition plan will be needed for these reforms to be effective. Prioritising efforts deserves more consideration. A Strategic Environmental Action Plan and Regional Programmes should be developed. There can be different timescales for implementing different aspects of the plan and programmes. Some reforms could be implemented relatively quickly. These include, for example, reform of the system of administrative penalties (fault-based payments) or the preference for the indirect method to assess compensation for environmental damages. Other reforms will be affected by longer-term decisions such as the introduction of the Integrated Environmental Permit (IEP) based on BAT. However, reforms need not be delayed; Israel, for example, has initiated a BAT approach building on the Industrial Emissions Directive without an IEP.

Resources are needed for a project-based approach, a risk register and a robust delivery unit to set out its goals/outcomes. Timescales should be used, steered by an inter-ministerial

governing body. This should set out risks to the implementation of the above recommendations, and measures to mitigate, such as the removal of barriers and constraints.

The government could consider putting in place a demonstration project. This could target one sector (e.g. power), a set of pollutants (SOx, NOx, PM), and take place in a selection of priority regions (i.e. heavily polluted oblasts). This would enable the main stakeholders to get together to demonstrate how a BAT-based approach would work in practice. It would certainly be best to de-link the demonstration project from financial reforms. These reforms could and should be undertaken in parallel, and brought together further down the line. There is a danger that introduction of BAT and IEP will make processes even more complicated and bureaucratic. Therefore, a representative group should be established to map out the "new" customer journey and design a process that is as clear and simple as possible. This should be done as part of the process to establish the initial BAT guidance.

At ground level in Nur-Sultan and in each priority region, an action plan for each priority industrial sector ("sector strategies to reduce pollution") should encompass the following elements:

- A definition of the addressable scope. This should evaluate the scope for reducing emissions reductions generated by stationary (fixed installations) and mobile (transport) sources within the value and supply chains that sectors can control and influence. It should also evaluate the scope for reducing emissions from the wider transport "sector" in industrial oblasts, where it is difficult to differentiate between fixed and mobile sources of pollution.
- Performance targets (see the section below on incentives).
- Possible state interventions combining:
  - technical measures: quick-wins (e.g. installations of simple electric filters, NOx filters, or better combustion techniques and process optimisation – see Box 2.5.), BAT and guidance needed to meet agreed industry sector goals, standards and targets (e.g. BAT-AEL)
  - direct regulatory measures: i) IEPs based on BAT (permitting process); ii) compliance promotion, monitoring and checking (compliance assurance); and iii) enforcement principles and practice (enforcement processes)
  - economic measures for pollution reduction and associated reforms: i) cost recovery for services provided to the industries being regulated (see the following section for further details); ii) market-based instruments to improve uptake of green technology; and iii) funding from the government (subsidies) and foreign investment to support and build capacity, closely linked with the strategy of Kazakh Invest to attract more knowledge-intensive industries.
- Possible delivery agents to be mobilised: state authorities (e.g. Ministry of Energy; Ministry of National Economy; Ministry of Industry and Infrastructure Development, particularly the Committee of Technical Regulation and Metrology; Akimats from the selected oblasts), companies, third parties including professional associations (e.g. National Chamber of Entrepreneurs; Association of Mining and Metallurgical Enterprises; Association of Kazakhstan Machinery Industry; American Chamber of Commerce in Kazakhstan; and Eurobak – the European Business Association of Kazakhstan), non-governmental organisations and citizens.

- Final outputs: a sector strategy to reduce pollution and determine the optimum mix of interventions.

5.3. Communicating, co-operating and building multi-level capacity for enforcement

In implementing OECD recommendations, policy makers should allow sufficient time for well-considered changes and consultations with all relevant stakeholders.

In line with establishing sector strategies to reduce pollution, more work is needed to ensure a whole-of-government mobilisation on the design, development and enforcement of a new mechanism of environmental payments. Engagement with all stakeholders, in particular the most important foreign and domestic emitters, should be stepped up. The establishment of an inter-ministerial working group involving several public and private stakeholders to support the development of the concept note to amend the Environmental Code was an encouraging step. It involved most stakeholders active with the Committee on Environmental Regulation and Control (CERC) of the Ministry of Energy.

Efforts to engage fully with the Ministry of National Economy, of Finance and of Industry and Infrastructure Development should be pursued. It is particularly important to obtain political will for reform and increase the level of awareness on the Polluter-Pays Principle. This should take place across the government and its national agencies with consensus reached on issues affecting tax, budgetary, justice, business and environmental arms of the government (and hence the legislative changes needed).

Stakeholder co-operation should be intensified at the interagency level, with the regulated community. In the context of using the full enforcement pyramid, stakeholder co-operation also comprises interagency co-ordination and external dialogue with the regulated community and the public at a sub-national level. This co-ordination should be intensified, as the integration of environmental permitting and compliance monitoring regimes accelerates in regions. Environmental regulators in oblasts will have to consult other authorities and collaborate with them in compliance monitoring and enforcement. Assessment of capacities and needs requires further analysis, which could draw on OECD's most recent work on multi-governance and political economy. Tools to be mobilised will depend on the specific objectives of the capacity building, audience and local institutional context.

The OECD has long experience of providing targeted interventions that could be harnessed. These interventions include assessment of administrative capacity, benchmarking and provision of advice. If feasible, they also include establishing and making sustainable a "policy and reform" support unit that can combine the knowledge of local conditions (via local experts) with international experience, and the catalytic role of international assistance. And SIGMA's Principles of Public Administration and experience from the establishment of the Reform Support Teams in Ukraine could be used as guidance.[1]

At a more granular level, Kazakhstan could take advantage of the OECD's ample experience to strengthen its compliance assurance systems, instruments and tools. Kazakhstan could envision screening the compliance assurance system based on an updated OECD approach and the EU IMPEL reviews, and then developing recommendations. It should encourage review of criteria for identifying, classifying and selecting installations for compliance monitoring and how to use risk-based tools for inspection planning, including those previously developed by the OECD. Finally, it should promote support to co-ordinated inspection campaigns based on standard checklists.

Kazakhstan should enhance exchanges with practitioners in OECD member countries. Visits to the Czech Republic or the Netherlands should build on previous visits to the Slovak Republic, Spain and Poland. It should continue to use resources, tools, expertise developed by the European Union Network for the Implementation and Enforcement of Environmental Law and the International Network for Compliance and Enforcement. To that end, it could explore linkages programmes and agreements to loan staff. These actions have become possible as more and more OECD member and partner countries publicly disclose compliance monitoring information and some even provide access to enforcement activities. Experience also suggests that a great deal of the value of Kazakhstan's participation in OECD committees stems from the formation of a network of peers. These provide targeted support for reform that extends well beyond the confines of formal committee or working group meetings. The government should thus allocate sufficient funds and experts to continue to engage with the relevant working parties and programmes of relevance under the OECD's Environmental Policy Committee. This would fall under the Memorandum of Understanding between the OECD and Kazakhstan renewed on 21 November 2018. Green growth and environment policy are one of the main pillars that structures co-operation over the next few years, building on the progress and results achieved during the first phase. The OECD Green Action Taskforce 2019-20 Programme of Work is entirely fitting, as it entails reforming regulatory regimes for large emission sources, including state-owned enterprises.

5.4. Enhancing data availability and quality for adequate monitoring and evaluation

The Ministry of Energy, Ministry of National Economy and Ministry of Finance should provide detailed data on the amount and type of pollutants that various categories of companies are emitting. They should also detail the amount of payments of various categories of companies. These companies should be identified, among others, by industry, region, size and ownership (foreign vs. domestic) to allow analysis of correlations between pollution emissions and payments. This would raise the level of transparency and trust.

Kazakhstan could intensify efforts to perform continuous monitoring and control over emission of pollutants through the CERC. It should encourage equipment for constant control of air emissions at large power plants, boilers and industrial enterprises. This could possibly take place in the context of establishing new forms of intervention and enabling approaches that support self-monitoring. While the air quality monitoring network has been significantly expanded in terms of number of monitoring stations and parameters being tracked, there are still opportunities for improving the network. This is particularly the case for the density of automatic air quality monitoring stations in large urban areas and industrial areas.

To move to a system of pollution prevention and control based on BAT, Kazakhstan will need to ensure that all operators (nature users) within scope establish verifiable emissions monitoring to provide accurate and reliable data. The BAT Reference guidance, or equivalent, should set out monitoring methods as an element of the recommended techniques. Requirements for each installation should be specified in integrated environmental permits and compliance-verified. If necessary, authorities should enforce the requirements. Elements for BAT, permitting, monitoring and compliance, and enforcement must be properly joined. This could be done by setting out how these elements are linked in a revised Environmental Code.

A well-functioning Pollution Release and Transfer Register would signal clearly to large polluting industries to be transparent about their emissions. It would also guarantee public access to data on emissions.

- Kazakhstan should accede to the UN Economic Commission for Europe Kyiv Protocol on Pollutant Release and Transfer Registers under the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters.
- Kazakhstan should consider following the OECD Council Recommendation on PRTR (OECD, 2018[1]) and comply with the OECD harmonised lists of pollutants and sectors for PRTR.
- Interested parties should submit an annual report on emissions and transfers of pollutants, wastewater and wastes to a national database. To that end, Kazakhstan should promulgate the necessary law or regulations to require enterprises belonging to the sectors under the Kiev Protocol, as well as other sectors required to comply with a BAT-regulatory model, to submit this report.
- Building on the January 2017 workshop organised with the UN Institute for Training and Research (Ministry of Energy of Kazakhstan, 2017[2]), Kazakhstan should continue to commit to learning from international good practices and possibly join the OECD Working Party on PRTR (WG-PRTR). The WG-PRTR discusses how to seek further harmonisation and efficiency in PRTRs, drawing on experiences of member countries. It shares good practices on using PRTR data, including tracking progress towards achieving the Sustainable Development Goals.
- Improving accessibility of the web-based platform will require proper scoping and funding. This will allow further development and maintenance of the state PRTR, providing for more awareness, usage and ownership of the reported data. Ultimately, the PRTR should become the one-stop shop for all stakeholders and for all national and international commitments.

The OECD is ready to support Kazakhstan with its work on assisting PRTR implementation. It aims at developing practical tools and guidance to help countries install and implement a PRTR, including through information and technical support. Special focus goes to improving PRTR data quality, exploring PRTR data applications and harmonising PRTR across the countries.[2]

Well-designed monitoring will allow Kazakhstan to track implementation of recommendations and achievements to encourage better environmental performance, adjust activities as needed and forecast the most likely medium-term and long-term outcomes. A monitoring and evaluation (M&E) system is more than the data systems used to track spending and outputs. Rather, it refers to regular and systematic collection *and use* of M&E information at various levels, be it an agency or the entire government (Mackay, 2010[3]). *Ex-ante* and *ex-post* appraisal will thus be critical.

Kazakhstan could draw on OECD experience to enhance cost-benefit analysis. For many countries, cost-benefit analysis is now central to the design and implementation of policies, particularly those related to the environment. The OECD has a long tradition of promoting the use of cost-benefit analysis in environmental policy development. The work ranges from the evaluation of environmental damages in monetary terms and the role of discounting to case studies of the application of cost-benefit analysis. The 2018 report "Cost-Benefit Analysis and the Environment: Further Developments and Policy Use"

provides a timely update on recent developments in the theory and practice of cost-benefit analysis. These could further inform decision-making processes in Kazakhstan (OECD, 2018[4]).

The OECD is ready to engage with Kazakhstan on its use of empirical programme evaluation studies to perform *ex-post* assessments of environmentally related tax policies. A number of studies credibly identified causal effects of environmentally related tax policies. However, they did not necessarily provide all the information needed to fully inform the policy-making process. Recent OECD analysis argues that cost-benefit analysis could enrich *ex-post* assessments of environmentally related tax policies. It could provide decision makers with a broader perspective of social costs and benefits, allowing identification of potential trade-offs among policy objectives (OECD, forthcoming[5]).

The OECD's continuous work on the lifecycle of regulations will also benefit Kazakhstan in relation to regulatory impact assessment. As noted recently, systematic approaches to evaluating whether laws and regulations achieve their objectives in practice are rare (OECD, 2018[6]).

Kazakhstan should continue to participate in OECD policy monitoring instruments. These could include, for example, the System of Integrated Environmental-Economic Accounting and Green Growth Indicators. The OECD explores monitoring and evaluation on a variety of environmental topics, including on its own through the various working groups and technical committees in particular the Working Party on Environmental Information, the Working Party on Integrating Environmental and Economic Policies or the Joint Meetings of Tax and Environment Experts. Kazakhstan should ensure continuous presence of its delegates at both political and technical levels.

5.5. Enforcing at ground level with adequate incentives

OECD/EU countries have some mandatory requirements on environmental inspections. The EU IED requires member states to set up a system of environmental inspections and draw up inspection plans accordingly. The IED requires a site visit with risk-based criteria at least every one-three years.

Kazakhstan has changed much of its legislation underpinning the inspection regime. This has been driven by the strategy towards enabling more private-led growth and increasing the attractiveness of the business and investment climate. Further clarifications will nevertheless be required. This is especially the case on issues related to the period during which a subsequent violation will be treated as a repeated violation (e.g. use of one-year interval or more).

- The 2015 Entrepreneurial Code[3] consolidated all laws regulating business activity as a whole, except for specific activities. Subsurface use, banking and insurance, for example, are regulated by special laws such as the Subsoil and Subsoil Use Code.[4] This Code is the reference legislation regulating all inspection procedures, including environmental inspections. The revised Environment Code should thus reference and not duplicate these provisions. Consequently, Kazakhstan should consider which Code could be used to set out the full range of compliance assurance approaches. Many of these could be applied more widely than to the environment, so the Entrepreneurial Code may be the "natural" home.
- Before the Environmental Code, the 2011 Law on State Control and Surveillance (no longer valid) introduced common principles for various inspections and risk-

assessment-based planning of inspections. It was amended in 2012 to introduce the ban on planned inspections for small and medium-sized enterprises during the three years from their registration date.

The right incentives should remain a priority. Kazakhstan should phase out incentives focusing on the number of fines issued. Incentives promoting the use of all non-compliance responses (and not only the generation of performance information) are needed. Otherwise, non-compliance responses would be reduced to record-keeping and revenue-raising. Performance targets based on an internationally recognised standard such as the ISO 14031 for guidance/methodology[5] could encompass: environmental state and conditions; operational activities and processes (e.g. use of abatement technologies and techniques); and management activities and processes (of sectors and organisations).

5.6. Drawing resource implications for better compliance, possibly with cost recovery charges

Kazakhstan should design transition schemes for expected loss of revenue to the state due to reforms. The transition to an OECD/EU system of enforcement, including the reform of penalties, could result in loss of revenue to the state. The same is true for some oblasts highly dependent on these environmentally related taxes for the general budget. Any consequential changes to other parts of the framework for environmental protection could also lead to revenue loss. Transition schemes should be designed, the nature and details of which go beyond the mandate of the joint project. Such plans would require in-depth socio-economic analysis with access to data, which could not be granted for practical and confidentiality reasons.

Kazakhstan needs to secure adequate funding and capacity to adopt features of the most modern environmental regulatory systems derived from the OECD. It should determine its needs in terms of competent staff (e.g. in conducting equivalency analysis), appropriate technologies and administrative processes/systems. Each should be evaluated in terms of best standards of an effective and efficient system that incentivises high levels of compliance, better environmental performance and uptake of cleaner technologies.

Kazakhstan should further assess the opportunity to establish "cost recovery for services" to regulated industries. This would follow the practices of some more advanced OECD countries that opted for more market-based instruments (MBIs).

- Revenue streams would i) recover the costs of implementing environmental protection; and ii) incentivise better environmental performance and deter non-compliance. Both points are linked because the costs of environmental protection should decrease as environmental performance and levels of compliance increase (there should be an inverse relationship).
- The payments (charges and taxes) for poor performers should outweigh any economic advantage that would have been gained by non-compliance. MBIs should reflect externalities. Conversely, payments should be reduced for good performers. The differential in payments for good and poor performance should give a clear economic advantage to better performers.

The example of the Scottish Environment Protection Agency (SEPA) Charging Scheme could be of interest.[6]

- SEPA derives about half its income from charges to operators of regulated activities. The remainder is from government grant-in-aid.

- SEPA charges for: i) applications, which are one-off charges intended to recover costs from new authorisations or changes to existing authorisations; and ii) annual changes, which are annual charges to recover ongoing costs of regulating an authorised activity.
- The charging scheme was developed using a combination of different datasets: past time recording data, workflow estimates, risk scores to plan inspection levels and complexity of reporting requirements.
- The scheme sets charges for waste management licences and exemptions; pollution prevention and control permits; authorisations for holding/use/disposal of radioactive substances; authorisations and registrations for discharges to water, water abstraction, impoundment and engineering; and registrations and authorisations for disposal to land.

5.7. Furthering the work on air pollution from mobile sources

Kazakhstan should continue to act on air pollution from mobile sources, which is expected to increase. The use of cars continues to grow, 70% of which are ten years or older. These older vehicles use low-quality fuels with high sulphur content and are barely compliant with Euro 2 standards. The transport sector causes 2% of the SO2 emissions, almost 40% of the CO emissions, 17% of the NOx emissions, 20% of emissions from non-methane volatile organic compounds and an estimated 35% of PM2.5 emissions (UNECE, 2019[7]).

The introduction of fuels of higher quality (Euro 2, 3 and 4 standards) has been announced and described in technical regulations but not yet implemented. The three oil refineries are being upgraded towards Euro 4/5 standards. However, more is needed to steer car and truck owners towards natural gas, petroleum gases or electrical propulsion and improve urban air quality, especially during winter. The vehicle taxation still does not take environment impacts fully into account. According to the Tax Code, the rates of vehicle taxes are differentiated based on engine volume (cm3). For instance, the tax rate for a vehicle with an engine size between 3 000-4 000 cm3 is 15 times higher than that for a vehicle with a size less than 1 100 cm3. For cars over 4 000 cm3, the tax rate is 117 times higher. In theory, this tax rate can incentivise purchase of smaller cars that, all things being equal, are less environmentally harmful. However, the policy conflicts with practice in a number of OECD member countries. These members have a long history of using one-time or recurrent vehicle taxes on the basis of CO2 emissions or fuel efficiency to drive demand for fuel-efficient and cleaner cars (UNECE, 2019[7]). The introduction of economic incentives to facilitate renewal of the car fleet will require further consideration. At the same time, the country should review economic incentives for annual inspection of motor vehicles to check the quality of exhaust fumes and completion of a one-time audit of the whole operational car fleet until 2020 (Kazakhstan, 2013[8]). The switch to gas or electrical combustion of all public transport in Almaty and other big cities (Nur-Sultan, Karaganda and Shymkent) should be further analysed, depending on gas resources and decisions on gas price subsidies. The recent OECD work, "Promoting Clean Urban Public Transportation and Green Investment in Kazakhstan", could inform this work (OECD, 2017[9]).[7]

Notes

[1] See http://www.sigmaweb.org/publications/principles-public-administration.htm.

[2] See further details on http://www.oecd.org/env/ehs/pollutant-release-transfer-register/oecd-activities-to-assist-prtr-implementation.htm.

[3] See http://adilet.zan.kz/eng/docs/K1500000375.

[4] See http://adilet.zan.kz/eng/docs/K1500000375/info.

[5] See https://www.iso.org/obp/ui/es/#iso:std:iso:14031:ed-2:v1:en.

[6] https://www.sepa.org.uk/media/348734/guidance-environmental-regulation-scotland-charging-scheme-2018.pdf.

[7] This report discusses the main results of an OECD project in 2017 on how to reduce air pollution from urban public transport in Kazakhstan. It analyses how to design a green public investment programme in this sector. The investment programme was designed to support modernisation of the urban transport fleet in the country and stimulate the domestic market to shift to modern buses powered by clean fuels. Two phases of the programme were foreseen: the first covers the cities of Kostanay and Shymkent, while the second covers all major urban centres. These investments are expected to improve air significantly.

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Annex A. Historical overview of the evolution of payments for emission

Evolution of the collection of payments for emissions in Kazakhstan

In Kazakhstan, like other countries of Eastern Europe, the Caucasus and Central Asia (EECCA), economic instruments of environmental policy were introduced in the early 1990s, when all these countries were still part of the Soviet Union.

The system of economic instruments in Western Europe differs significantly from that in EECCA countries. The former mainly includes taxes on products, for example, on energy carriers, as well as targeted taxes on emissions/discharges of certain pollutants. Conversely, the latter has a unique system of payments for air pollution, water sources and the generation of solid waste.

In Kazakhstan, economic mechanisms for regulating environmental protection and environmental management started with Nature Protection Committees, as they were organised in the Republics of the Soviet Union in 1988. Previously, some elements of environmental management took place. These took the form of payments for use of natural resources received by the state budget. Funds were allocated for the protection and production of natural resources to the relevant competent agencies.

The payment for environmental pollution was not yet introduced and was a subject of scientific discussions. Considering the high share of the state in the economy, there were neither economic incentives, nor a generally accepted method for their establishment.

As early as 1989, some regions introduced a charge for environmental pollution decided upon by local executive authorities. The Typical Methodology of the USSR State Committee for Nature (N.N. Lukyanchikov with co-authors) was used as a basis to determine payments. It contained the basic methodological techniques that have since become the foundation of the Kazakhstani payment system:

- payments for environmental pollution (air, surface and groundwater)
- cost method of determining the standards of fees
- the method of reducing the mass of pollutants to the conditional mass using the reduction factor presented below.

The standards of fees and charges for emissions (discharges) of pollutants into the environment for a specific region (P) within the established limits in the planned (calculated) period were determined in accordance with the methodology recommendations approved by the State Committee of the Kazakh SSR. The definition of emission charges (discharges, disposal) of pollutants into the environment was set according to the formula:

$$P = \sum_{t=1}^{T} З_{t=1} M^{Л}{}_{t}$$ where,

- $З_t$ is the cost in t year (t = 1,2,…., T; T being the plan period value), necessary to prevent and compensate for damage caused by emissions (discharges) of pollutants into the natural environment, determined by the republican and regional environmental programmes, plans to eliminate (prevent) the effects of environmental pollution, as well as taking into account contributions to finance inter-regional, inter-republican and all-union environmental programmes (excluding costs for activities carried out by enterprises at their own expenses), in rubble.
- $М^{л}_t$ is the reduced limit of emissions (discharges) of pollutants into the environment for the region as a whole in the t^{th} year, calculated on the basis of the tasks of the regional environmental protection programme, services tonne/year, determined by the formula:

  $$М^{Л}_t = \sum_{J=1}^{J} М^{л}_{jt,}$$ where

  $М^{Л}_{jt}$ is the reduced limit of emissions (discharges) of pollutants into the environment, j is an enterprise in the t^{th} year, the condition t/year, determined from the condition:

  $$М^{Л}_t = \sum_{J=1}^{J} К_i \, м^{л}_{jt}$$, where

  i is the type of polluting substance (i = 1, 2…J)

  $К_i$ is the reduction factor, taking into account the relative danger of i^{th} –the polluting substance calculated by the formula:

  $К_i = 1/МРСРS_i$, where

- $МРСРS_i$ is the maximum permissible concentration of polluting substances (for fishery purposes – for water; sanitary daily average rate for air [see List and codes of air pollutants, St. Petersburg, 1995 expressed in mg/m^3]).
- $м^{л}_{jt}$ is the limit of emissions (discharges) of the i^{th} pollutant in the natural dimension by j – the enterprise in the t^{th} year. The values of these limits are set for each project of the enterprise, in accordance with the stages of achieving the standards for maximum permissible emissions (MPE) or maximum permissible discharges (MPD), and are co-ordinated with the environmental competent authorities.

In this case, the calculation took into account all pollutants according to the draft MPE (MPD). As can be seen from the formula, this methodology only determined general standards for payments. It makes no differentiation by pollutant, but considers the hazard class of emissions.

The nature of payments for environmental pollution became more systemic after the creation of the State Regulatory Committee and the methodological framework, which was initially tested in a number of regions and then resulted in several activities:

- creation of regional (1989-91) and of republican (1998) environmental protection funds
- rationalisation of maximum permissible emissions and discharges into the environment, based on instructions for the development of MPE and MPD
- approval in 1994 by the Ministry of Ecology and Bioresources of the "Methodology for determining payments for environmental pollution"
- approval in 1995 of the "Temporary procedure for compensation of damage caused to the environment by violation of environmental legislation"
- approval in 1996 of the methodology for determining payments for pollution of the environment by mobile sources
- establishment of government payments for the use of natural resources
- consolidation of the nature conservation funds into the republican and regional budgets and transfer of functions for the collection of payments to the tax inspectorate.

In 2001, the government abolished the Republican Fund for Environmental Protection, and in 2002 the regional funds were transformed into units of akims (mayors) apparatuses.

International experts of the UN Economic Commission for Europe and the OECD conducted the first environmental performance review of Kazakhstan in 2000. In accordance with recommendations from the report, the amount of pollutants on which payments are imposed has been significantly reduced since 2008.

The Tax Code of the Republic of Kazakhstan establishes the rates of pollution fees resulting from emissions into the environment.

Categorisation of environmental charges and payers

Payments for emissions into the environment in accordance with the Environmental Code of Kazakhstan are one of the main mechanisms for the economic regulation of environmental protection and environmental management.

Payers of payments for emissions are individuals and legal entities permanently or temporarily residing in Kazakhstan, operating in the territory of Kazakhstan and undertaking "**a special use of nature"**.

The Tax Code and the provisions of the Environmental Code (as amended) regulate the categories of taxpayers, the standards for emissions of harmful substances and the calculation of payments for emissions into the environment.

The "special use of nature" is carried out on the basis of an environmental permit. This is issued by a competent authority in the field of environmental protection or by the local executive bodies of regions, cities of republican significance (e.g. Almaty) and Nur-Sultan, except for emissions of pollutants from mobile sources.

Structural divisions of a legal entity are recognised as independent payers based on their location. The recognition of a payer's structural divisions for the emission comes into force on 1 January of the year that follows the registration of the structural divisions and adoption of the relevant decisions.

Newly created structural divisions are recognised from the day of their creation or from 1 January of the following year of creation of the division.

Taxpayers who apply for a special tax regime for peasant or private farms **are exempt from paying** for environmental emissions, which are caused by the activities covered under the special tax regime for peasant or private farms.

The object of taxation is the actual volume of emissions into the environment. This includes emissions established by the competent authority in the field of environmental protection and during the inspections by regional bodies to ensure compliance with the environmental legislation of Kazakhstan. The emissions covered are those in the form of:

- emissions of pollutants
- discharges of pollutants
- disposed production and consumption wastes
- placed sulphur, generated during oil operations.

The fulfilment of tax obligations for the payment for emissions into the environment does not exempt the nature user from compensation for damage to the environment.

Annex B. Environment Agency (England): Interventions available for enforcement

This annex provides a more systematic summary of intervention available at the Environment Agency (England) as part of the enforcement pyramid. The following details are extracted from the section 7.1 of the policy paper Environment Agency enforcement and sanctions policy, as updated on 8 May 2018.[1]

Advice and guidance

The agency can support an individual or a business who has committed an offence or is likely to commit an offence by giving advice and guidance.

The advice and guidance can be verbal or written and may be recorded.

Any continued or further breach may influence a later choice of enforcement action. This will be without prejudice to (this means, will not affect) any other enforcement action that may be required.

The objective is to provide an opportunity for the operator to return to compliance and stay compliant.

Warnings

The agency can issue a written warning if it believes an individual or business has committed an offence. This will set out:

- the offence the agency believes has been committed
- the action(s) the agency expect to be taken by when
- what will happen if action is not taken.

The warning is usually a letter, or a written site warning, issued as a result of a compliance visit at a site with an environmental permit. The warning will be kept on record. Any continued or further breach may influence a later choice of enforcement action.

Notices, powers and orders

Many of the regimes the agency enforce contain powers to serve specific enforcement notices. The agency may serve these where appropriate. These require the recipient to stop offending or to restore or remediate the environment.

Civil penalties for climate change schemes

Climate change schemes have a specific civil penalties framework. The document "Annex 2: the Environment Agency's approach to applying climate change civil penalties"[2] sets forth how it works out the penalty for each breach.

Civil sanctions

These sanctions are set out in the Regulatory and Enforcement Sanctions Act, also known as the Res Act and are commonly referred as "RES Act civil sanctions". The full list of every breach and offence to be regulated, and the accompanying enforcement actions is available in the Offence Response Options document.[3]

Fixed monetary penalties (FMP)

The agency may issue FMP:

- where the agency has given advice and guidance, it has not been followed and improvements have not been made
- for minor offences or where there is no direct environmental impact, such as paperwork and administrative offences.

The FMP is £300 (EUR 335) for businesses and £100 for individuals. Paying 50% of the sum due within 28 days of receiving the notice of intent that the penalty will be imposed will clear legal responsibility for the FMP. Or if representations have been made within the 28 day period but a final notice is served, legal responsibility can still be cleared by paying 50% of the sum due within 28 days of the final notice.

The outcome the agency wants to achieve is a change in the offender's behaviour.

Variable monetary penalties (VMP)

The agency may issue VMP for more serious offences, including:

- when there is evidence of negligence or mismanagement
- when there is an environmental impact
- to remove an identifiable financial gain or saving as a result of the breach
- where it is not in the public interest to prosecute

The agency may issue a VMP in conjunction with a compliance or restoration notice.

Compliance notices

The agency may issue a compliance notice where it:

- requires the offender to take action to come back into compliance, for example, where an individual or business has regularly submitted data returns as required but stops doing so
- has given advice and guidance, it has not been followed and improvements have not been made.

The objective is to achieve a change in the offender's behaviour.

The agency may issue a compliance notice in conjunction with a VMP or restoration notice to change the offender's behaviour and to put right environmental damage.

Restoration notices

This is a formal notice, which requires the offender to put right any damage caused by an offence. The offender will be required to take the steps set out in the notice by the specified date(s) to restore the situation as far as possible to what it would have been if the offence had not been committed.

The agency may issue a restoration notice when:

- the restoration has not voluntarily been done;
- the agency has given advice and guidance, it has not been followed and the damage has not been put right;
- there is no other suitable enforcement notice available.

The objective is to get the environmental harm or damage put right.

The agency may issue a restoration notice in conjunction with a VMP or a compliance notice.

Stop notices

A stop notice requires an activity to stop immediately. It remains in force until the required actions set out in the notice, to remove or reduce the harm or risk of harm, are completed.

The agency does not have to serve notice of intent before it serves a stop notice.

The agency can issue a stop notice when an activity by an individual or business is:

- causing or presenting a significant risk of causing serious harm to human health or the environment, including the health of animals and plants
- committing or likely to commit a specified offence.

The agency can also issue a stop notice when an activity by an individual or business is likely to continue:

- and will cause or will present a significant risk of causing serious harm to human health or the environment, including the health of animals and plants
- or will involve or will be likely to involve a specified offence being committed.

Enforcement undertakings

An enforcement undertaking is a voluntary offer by an offender to put right the effects of their offending, its impact on third parties and to make sure it cannot happen again. The Environment Agency must have reasonable grounds to suspect that the offender has committed a specified offence. If an enforcement undertaking is offered it is not an admission of guilt for any offence to which it relates. If the agency accepts the offer, it becomes a binding agreement between the agency and the person who makes the offer.

If the offender complies with the undertaking then:

- the agency cannot prosecute for the original offence
- the offender will not get a criminal record for that offence, but the agency will publish the details on the GOV.UK website and it may be included in the public register.

Where it is not possible to fully restore any environmental damage then the offer needs to include some form of:

- environmental benefit or improvement
- compensation for damage to the natural capital, such as money for a project to improve river quality following a water pollution incident.

The offender must also state the action it will take to ensure future compliance, such as investing in an environmental management system.

Enforcement cost recovery notices (ECRN)

The agency will always try to recover the money it has spent on work connected with an offence and imposing a sanction. The agency can serve an ECRN, which will require the offender to pay the actual cost to the Environment Agency. If the offender is unable to pay the amount due for the civil sanction and the ECRN, the agency may reduce the sanction but is unlikely to reduce the ECRN. This is because the agency has a duty to protect public money.

The agency cannot serve an ECRN with a FMP.

Non-compliance penalty notices (NCPN)

The agency can serve an NCPN or prosecute if an offender fails to comply with the requirements of a:

- compliance notice
- restoration notice
- third party undertaking – a payment to someone affected by an environmental incident.

The agency will normally serve an NCPN and determine the amount of the NCPN by assessing:

- what it will cost the offender to fulfil the remaining requirements of the compliance, restoration notice(s) or third party undertaking
- the reasons for the breach
- public interest factors.

The notice will no longer be payable if the requirements of the original compliance notice or restoration notice are complied with or a third party undertaking is fulfilled before the time set for payment.

If an NCPN does not achieve compliance with the original notice, the agency may still prosecute for the original offence.

Criminal proceedings

If the Environment Agency decides to prosecute it will:

- exercise prosecutorial independence

- ensure any case put forward for prosecution meets the test in the Code for Crown Prosecutors.[4]

To ensure a fair decision-making process, the decision to prosecute must be taken independently of the investigator. This is particularly important where the prosecutor works for the same organisation as the investigator. When the Environment Agency decides to prosecute it is not influenced by a government department or minister or any third party. It is an independent decision.

Fixed penalty notices (FPN)

The FPN is a financial penalty and gives the offender the chance to pay a fixed amount of money by a set date. If the penalty is paid by the set time, the offender is no longer liable for that offence and no further action will be taken. Any continued or further breach may influence a later choice of enforcement action.

If the FPN is not paid, the agency will normally prosecute for the original offence.

Formal caution

The agency can only use a formal caution where it considers it could bring a prosecution and the offender:

- admits the offence
- consents to be cautioned.

The agency will keep a record of the formal caution. It will be produced in court if the offender is later found guilty of a further offence. The agency will use a formal caution to deter future offending. If the offender will not accept the formal caution it will normally prosecute for the original offence.

Prosecution

The Environment Agency considers prosecution when it believes a person or business has committed a crime against the legislation it enforces. Provisions in the legislation state what penalty the courts can apply. This could be a specified maximum fine, unlimited fine or imprisonment. For a decision to prosecute, the Environment Agency ensures:

- there is sufficient evidence – it must be sure of a realistic prospect of securing a conviction
- it is in the public interest to commence criminal proceedings
- it has considered if a different response is more appropriate.

Orders imposed by the court ancillary to prosecution

The agency can apply to the court for ancillary orders following a conviction, including:

- disqualification of a director
- confiscation of assets, under the Proceeds of Crime Act 2002
- a criminal behaviour order
- forfeiture of equipment used to commit the offence

- disqualification from driving
- a compensation order
- vehicle seizure
- a remediation order.

After a conviction, the Environment Agency may also review and reconsider competence to hold a permit, and suspend or revoke the permit.

Notes

[1] https://www.gov.uk/government/publications/environment-agency-enforcement-and-sanctions-policy/environment-agency-enforcement-and-sanctions-policy.

[2] See https://www.gov.uk/government/publications/environment-agency-enforcement-and-sanctions-policy/annex-2-climate-change-schemes-the-environment-agencys-approach-to-applying-civil-penalties.

[3] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770185/Enforcement-and-Sanctions-Offence-Response-Options.pdf.

[4] See https://www.cps.gov.uk/publication/code-crown-prosecutors.

Annex C. Illustration of a penalty calculation with a gravity component

Table A C.1. Calculations based on the BEN model

Inputs	
Initial capital investment	USD 100 000
One-time, non-depreciable expenditure	USD 80 000
Annual operating and maintenance expenditure	USD 10 000
Non-compliance date	01/06/2005
Compliance date	01/12/2008
Estimated penalty payment date	30/01/2009
Discount rate	9.1%
Outputs	
Present values as of non-compliance date	
Capital and one-time costs in the absence of non-compliance (A)	USD 102 091
Capital and one-time costs with delayed compliance (B)	USD 88 199
Avoided annually recurring costs (C)	USD 16 453
Economic benefit as of non-compliance date (A-B+C)	USD 30 345
Final economic benefit as of the estimated penalty payment date	***USD 41 769***

Source: (OECD, 2009[1]).

Annex D. Natural Resource Damage Assessment (NRDA) using equivalency analysis

This annex provides more details on equivalency analysis that support the NRDA. This process emphasises use of remediation measures following damage to the environment. These measures offset the loss of natural resources and the provided services rather than merely seeking to collect monetary damages from the polluter.

In OECD member countries, where a polluter's activities have caused damage to the environment, the polluter may be required to: i) remediate the environment; and ii) compensate the public for the natural resources/services lost during the period in which the environment was impaired.

This compensation is resource- or service-based, not monetary. Competent authorities use an approach termed "equivalency analysis" to determine: i) the type and amount of natural resources and services that are lost over time as a result of the damage; and ii) the type and amount of complementary and compensatory remediation actions needed to offset that loss.

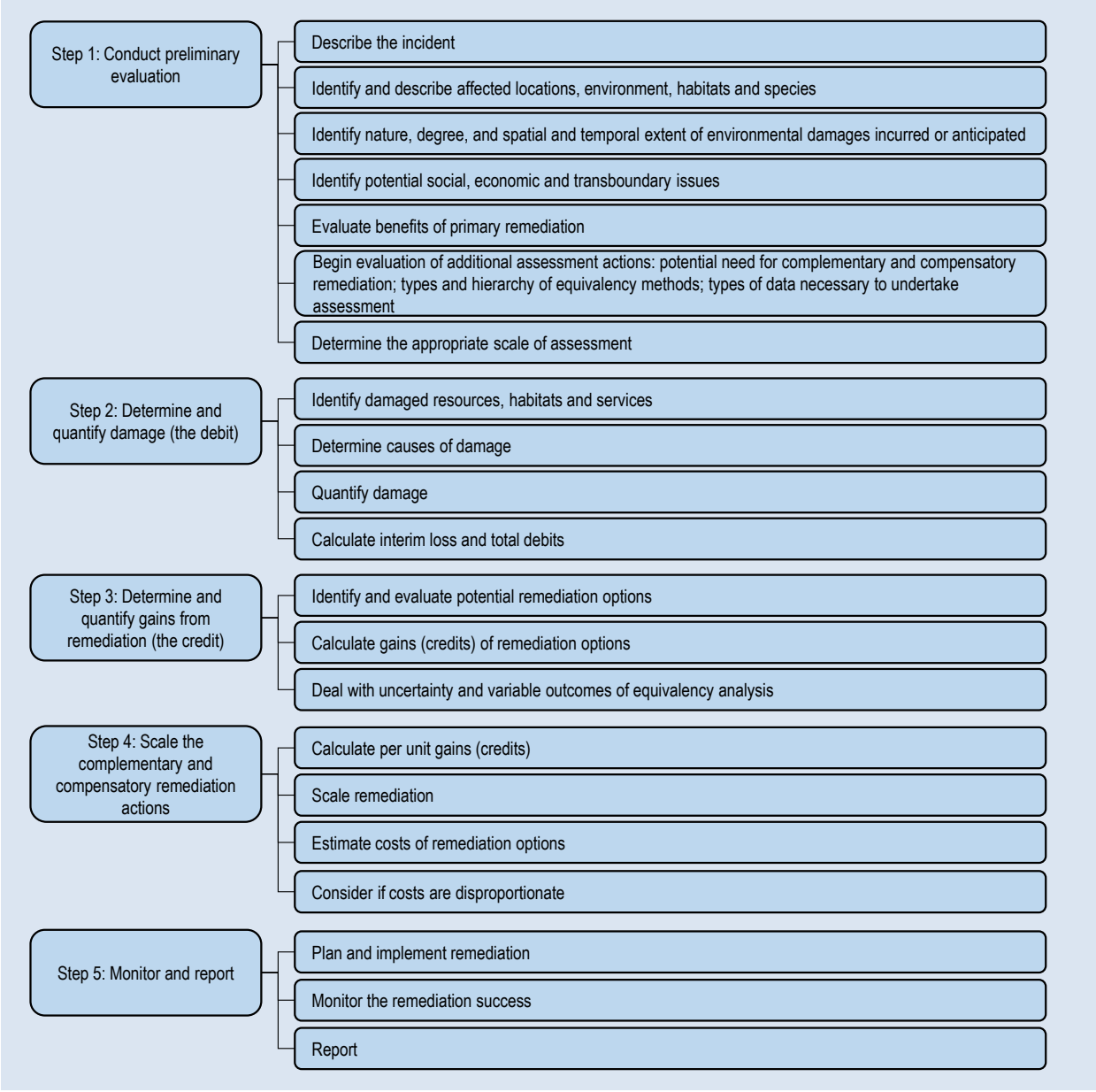
Equivalency analysis and the ELD

Annex II of the ELD states that resource-to-resource or service-to-service equivalence approaches should be considered first to determine the scale of **complementary and compensatory measures** to remediate damaged water or protected species or natural habitats (importantly, not land).[1] If their use is not possible, alternative valuation techniques are to be used (e.g. monetary valuation).[2] Should monetary valuation techniques be needed, the ELD prefers value-to-value over value-to-cost approaches.[3] The competent authorities are permitted to prescribe the method to be used.[4] Competent authorities thus have significant discretion to determine the approach.

Key steps in conducting an equivalency analysis

In general, conducting any type of equivalency analysis will entail five fundamental steps (see Figure A D.1).

Figure A D.1. Examples of environmental liabilities and damages



Source: (European Commission, 2013[2]).

Equivalency analysis: Methods

There are three main methods of equivalency analysis: service-to-service, resource-to-resource and value equivalency. These methods are analysed after the definition of core terms:[5]

- **Debit**: an expression of the quantity of *loss* suffered as a result of the environmental damage; it may be multi-dimensional as the damage may have negative effects on a number of different species, habitats, ecosystem functions and human values.

- **Credit**: an expression of the natural resource or service *benefit* gained through complementary and compensatory remediation.
- **Metric(s)**: one or more *measurements of loss*, usually determined in close consultation with relevant environmental scientists, which serve as indices of keystone natural resources or services subject to damage. The same metric must be used to express the total damage (debit) and the benefit of remediation (credit).
- **Scaling**: the process whereby the expected amount of benefit (i.e. credit) generated from the remediation is made to *equal* the debit, when quantified in terms of the same metric.[6]
- **Discounting**: the use of a discount rate (e.g. 3%). This reflects that, holding all other factors constant, losses from damage and gains from remediation accrue over different periods. Furthermore, it also assumes that services gained from future remediation are less valuable to the public than services available today (Chapman and LeJeune, 2007[3]). It permits gains and losses to be reflected in their *present day value*.

Service-to-service

With this method, also known as Habitat Equivalency Analysis (HEA), losses are expressed in terms of habitat and are offset by remediation of similar habitat (Lipton et al., 2018[4]). It assumes that equivalent habitats will provide equivalent services. In this way, the provision of acres of additional habitat can compensate for years of lost services.[7] This particular form of equivalency analysis is intended for use when the service losses arising from the pollution incident are primarily ecological and not direct human use (e.g. recreation) (Desvousges et al., 2018[5]). Services to ecosystems and other ecological resources include habitat for food, shelter, and reproduction; organic carbon and nutrient transfer through the food web; biodiversity and maintenance of the gene pool; and food web and community structure (Chapman and LeJeune, 2007[3]). In HEA, the basic unit of measurement is, typically, a discounted-service-acre-year (DSAY). This represents the value of all of the ecosystem services provided by one acre of the habitat in one year.[8] Once calculated, remediation measures are selected that would adequately offset these DSAYs in the form of acres of remediated habitat.[9]

Resource-to-resource

This method, also known as Resource Equivalency Analysis (REA), is fundamentally the same as HEA. However, crucially, the units of quantification differ with losses being expressed in terms of *resource units* (e.g. numbers of fish or birds) rather than habitat (Lipton et al., 2018[4]). The method tries to match the actual lost resources with new ones. For this to work, it is essential to determine precisely which organisms are lost from a particular impact and which are gained by remediation (OECD, 2012[6]). The method may be more appropriate than the service-to-service approach where the pollution incident has had a significant effect on *particular* animals or plant populations (OECD, 2012[6]). Desvouges et al. (2018[5]) observe that, in practice, REA is less frequently used as a scaling technique in damage assessments than HEA.

Value equivalency

As the underlying premise of techniques in this category, damage to natural resources and the services they provide can be measured in *monetary terms* and compensated through

provision of physical resources and services (Lipton et al., 2018[4]). Under the **value-to-cost** version, the monetary assessment of the damage ensuing from the incident is set as the budget for remediation, *the benefits of which are not estimated directly* (European Commission, 2013[2]). Under the **value-to-value** version, both the value of damage and the benefits from remediation are measured in monetary terms (European Commission, 2013[2]). Although compensation may be measured (or scaled) in monetary terms, compensation under the ELD can only be provided in resource-based units, *not money* (Chapman, Scott and Özdemiroğlu, 2018[7]). This is where the ELD and other frameworks of environmental liability differ from the "indirect" method of assessment in Kazakhstan.

In value equivalency, monetary values are based on individuals' preferences for given *changes* in the quality and/or quantity of resources of service (Chapman, Scott and Özdemiroğlu, 2018[7]). There are two means of measuring preference: i) individuals' willingness to pay money (WTP) to avoid an environmental loss or to secure a gain; or ii) their willingness to accept money as compensation (WTAC) to tolerate an environmental loss or to forgo a gain (Chapman, Scott and Özdemiroğlu, 2018[7]). Environmental values that depend upon people's actual use of the environment are referred to as *use* values. Those that derive from people's contentment from knowing that environmental resources are preserved even if they do not directly use or interact with them, or never will, are referred to as *non-use* or *existence* values (Hanley, 2002[8]). Reductions and gains in *use* and *non-use* values will be included in the debit and credit estimates in equivalency analysis conducted in relation to environmental damage arising under the ELD (Chapman, Scott and Özdemiroğlu, 2018[7]). As these types of values are often not priced in the market, two broad techniques have emerged that help determine appropriate monetary values for the equivalency analysis:

Revealed preference techniques

These techniques use information about people's *actual* behaviour in markets related to the resources of services being valued to estimate value (Chapman, Scott and Özdemiroğlu, 2018[7]). There are two main methods:

- **Travel cost:** this method estimates economic values associated with ecosystems or sites that are used for *recreation* by assuming the value of the site is reflected in how much people are willing to pay to travel to visit it (OECD, 2012[6]). Such costs include: transport, accommodation, food and drink, and recreational activity (Chapman, Scott and Özdemiroğlu, 2018[7]). This is then used as a proxy for a market price. Thus, for instance, individuals' WTP to visit the site can be estimated based on the number of trips made at different travel costs.
- **Hedonic analysis:** this method is used to estimate economic values for environmental services that *directly affect* market prices, such as housing prices (OECD, 2012[6]). This technique reflects the understanding that the value for a good can be divided into component parts (Chapman and LeJeune, 2007[3]). For example, all else held equal, a home near a polluted site will cost less than one far away from it. The difference in housing price reflects an estimate of the loss in value flowing from the pollution (OECD, 2012[6]). This loss in value could then be expressed as the value that a remediation action must create to compensate the public for the pollution (Chapman and LeJeune, 2007[3]).

Stated preference techniques

Stated preference methods use questionnaires to elicit the respondents' WTP for the provision/conservation of a given environmental asset directly or WTAC for the loss of an environmental asset (OECD, 2012[6]). Hypothetical markets are presented to a representative sample of the population affected by these changes (Martin-Ortega, Brouwer and Aiking, 2011[9]). Answers reflect intentions rather than actual behaviour. There are two main survey-based methods for the valuation of non-market resources (Chapman and LeJeune, 2007[3]):

- **Contingent valuation method (CVM)**: individuals are questioned directly about how they value the prevention of a specific environmental damage and the implementation of proposed restoration projects.
- **Conjoint Analysis:** individuals are questioned about how they value the prevention of a specific environmental damage and the implementation of proposed restoration projects but they are given more choices that CVM.

Equivalency methods: Strengths and weaknesses

The following section sets out the strengths and weaknesses associated with different methods of equivalency methods discussed above. Since service-to-service and resource-to-resource approaches are conceptually similar (Lipton et al., 2018[4]), they are analysed to together.

Service-to-service (or HEA)[10] and resource-to-resource (or REA) [11]

Characteristics

HEA: Habitat equivalency analysis

Losses are expressed in terms of habitat and are offset by remediation of similar habitat. The underlying assumption is that equivalent habitats will provide equivalent services. In this way, the provision of acres of additional habitat can compensate for years of lost service.

REA: Resource equivalency analysis

While fundamentally the same as HEA, the units of quantification differ with losses expressed in terms of resource units (e.g. numbers of fish or birds) rather than habitat.

Strengths

- It avoids the need to quantify lost natural resources and services in monetary terms (and the controversy and methodological difficulties associated within this).
- It is of greatest use when the service losses are primarily ecological; such losses are difficult to quantify in monetary terms.
- It is useful when the services provided by the replacement habitat/resource are ecologically similar to those provided by the natural resources damaged by the pollution incident.
- HEA can reflect the variability and complexity of ecosystems in a way in which VEA cannot.

- Where the natural resources and services damaged can be identified with ease and remediation through provision of equivalent habitat/resources is possible, HEA/REA is likely to be more effective than VEA in determining with accuracy the appropriate degree of compensatory remediation for service losses.
- When a pollution incident has had a significant effect on a particular natural resource (or resources), such as certain animal or plant populations, REA may be best placed among the different equivalency analysis methods to determine appropriate remediation measures.
- The risk of a polluter's liability for remediation costs is derived using HEA/REA is perceived to be easier to absorb for the insurance sector than non-market valuation techniques (e.g. revealed preference). This, it seems, goes to the relative unpredictability of the results produced from revealed preference studies (more on which is said below).

Weaknesses

- The methods do not factor in human welfare considerations to the analysis; these may be viewed as important and relevant following damage to the environment from a pollution incident.
- The methods assume that the public's loss of utility can be compensated through provision of equivalent habitat/resources. However, HEA/REA are, arguably, of less value than VEA methods where the service losses are primarily human use/social (e.g. recreational) or such losses comprise a significant portion of total losses.
- It may not be appropriate where the services provided by remediation measures are of a different type or quality than those lost following the pollution incident.
- It may not be appropriate where the services lost cannot be measured accurately.
- It assumes that the public place equal value on the services provided at the site subject to damage and the restored site (where complementary remediation is carried out); this may not be the case owing to certain site-specific considerations (e.g. cultural/ethical).
- It cannot capture the fact that social values of a site may be heterogeneous so that particular groups may be perceived to incur higher losses than others.
- Neither HEA nor REA allow for changes in preference. They assume the value to society of a given habitat/resource is constant over time. However, there is the argument that increasing development may, for instance, lead to a shortage of certain resources. This, in turn, increases the value of the loss in the future and renders damage more costly today.
- It may not be appropriate, where there is difficulty in agreeing to a common metric, to reflect the services damaged by the pollution incident and those gained through remediation.
- It is unable to reflect the value of natural resources and services that are irreversibly lost and so non-recoverable following a pollution incident (e.g. endangered species and habitats).

- As with all equivalency analysis models, a lack of input data limits the validity of the outputs.

Value equivalency analysis (VEA)

Characteristics

Travel cost and hedonic methods use "revealed preference" information about individuals' actual behaviour to estimate value.

Contingent valuation method (CVM) and conjoint analysis use "stated preference" methods to estimate value.

Strengths

- It provides a means of measuring the monetary value of natural resources that are not traded in economic markets.
- It measures the socio-economic value of ecosystem services, something which HEA/REA are unable to do.
- It incorporates the social value of the environment into the decision-making process.
- Revealed preference techniques are particularly useful where the pollution incident impacts upon recreational activities.
- Hedonic pricing is useful for estimating economic values for changes in environmental quality that directly affect market prices e.g. the value of real estate or timber.
- Where remediation of the same/similar resources or services is not technically feasible, undesirable or unreasonably expensive, then VEA might provide a better means of scaling remediation than HEA/REA.
- Databases can be built to store evidence of economic value that can facilitate quicker and cheaper VEA assessments at a later date. Moreover, they may be considered particularly helpful where primary economic research cannot reasonably be undertaken.
- VEA is useful where the scope of environmental damage following a pollution incident is so large that the use of HEA/REA, and important assumptions which underpin their use, are unsupportable.
- VEA may be useful where an alternative site benefiting from complementary remediation is located far from the site damaged by the pollution incident.

Weaknesses

- VEA reflects an anthropocentric view of nature (i.e. environment possesses value due to its impact on humans), which can be controversial.
- The requisite data/level of data may not always be available at a reasonable cost and within a reasonable time.

- Services provided by natural resources are extremely difficult to value in monetary terms and, consequently, the results may be controversial and open to legal challenge.
- There may be deemed to be a high degree of artificiality in the results produced by VEA given that the method seeks to value goods and services that are not traded in economic markets; they have no objectively verifiable market value.
- Results produced by CVM and the travel cost method can be extremely subjective and unpredictable.
- Stated preference approaches can be controversial given their foundation on hypothetical intentions rather than actual behaviour.
- Relatedly, stated preference approaches are subject to biases and may generate responses which evidence strategic behaviour by the respondents.
- VEA does not capture non-anthropocentric values of nature.
- VEA cannot capture cultural or ethical values which people attach to the environment. This means that results may not reflect the total value which people place on changes in environmental quality following a pollution incident.
- The particular technical choices by the statistician when undertaking estimates of WTP using revealed and stated preference techniques can have significant impacts upon the eventual outcome of the analysis and, consequently, the extent of "compensation" required from the polluter. The fact that different choices may be defensible with no "right" choice may be seen to create a degree of unfairness for polluters.
- The level of information provided to survey respondents when using CVM can influence an eventual estimate, leading to important questions as regards the appropriate level of information to be provided.
- The production of a robust contingent valuation model takes time (sometimes 12 months) and can be very expensive (USD 1 000 000).
- The very idea of WTP and WTAC, when applied *ex post* to harm that has already been caused to the environment by a pollution incident, may be repugnant to portions of society.
- WTP and WTAC measurements for the same pollution incident can differ widely, creating scope for legal argument and the time and cost flowing with this.

Notes

[1] ELD, Annex II, para 1.2.2

[2] ELD, Annex II, para 1.2.3.

[3] ibid.

[4] ibid.

[5] The definitions are taken from the ELD Training Handbook, p. 50 (European Commission, 2013[2]).

[6] Scaling has three broad steps: i) quantification of the total debits caused by the damage; ii) quantification of the credit expected per unit of remediation; and iii) division of the total debit by the unit credit to determine the total amount of credits (i.e. remediation) needed to offset the loss (Lipton et al., 2018[4]).

[7] U.S. Department of Commerce: National Oceanic and Atmospheric Administration, "Habitat Equivalency Analysis" (Damage Assessment, Remediation, and Restoration Program, undated) https://darrp.noaa.gov/economics/habitat-equivalency-analysis accessed 25 January 2019.

[8] ibid.

[9] ibid.

[10] Also known as Habitat Equivalency Analysis (HEA).

[11] Also known as Resource Equivalency Analysis (REA).

Annex E. Means of evidencing financial provision

This annex provides details on ways in which financial provision may be made.

Cash deposit

Characteristics

With a trust fund, payments would be made into the trust until full provision has been made for the resource user's obligations. A charge over the contents of the trust would secure the funds in the event of the resource user's bankruptcy.

With escrow accounts and cash deposits, funds are deposited with a third party, often a bank. They are only to be available to the competent authorities where certain conditions specified in the underlying agreement between the resource user and the competent authorities are satisfied.

Strengths

- It ensures ready availability of private funds to undertake the works required of the resource user; access is immediate upon presentation of relevant documentation.
- Funds and assets are segregated from the general body of the resource user's assets (i.e. "ring-fenced"). This means they are likely to be beyond the reach of its creditors should it subsequently enter into bankruptcy or deteriorate financially.
- It redresses the risks associated with the non-renewal of products from third-party providers, such as insurers or banks, i.e. where products must be renewed on a regular basis, there is the prospect that deterioration of a resource user's financial strength may mean the bank is no longer willing to provide a guarantee.
- Determining the level of cash or other assets deposited with the third party by a risk assessment of the resource user's activities provides a strong economic incentive for the resource user to operate safely to ensure full recovery of the cash or assets upon termination of the activity.

Weaknesses

- Where the balance does not accrue fully until the final payment has been made and there is no other supplementary/complementary financial provision in place then the value of the "deposit" may be insufficient to cover the necessary costs should it be needed in the event of bankruptcy prior to full capitalisation.
- It sterilises funds and assets during the operational phase of the activity in the sense that they are "locked in" and inaccessible to the resource, e.g. assets are unable to generate debt finance from a bank.

Charge on assets (trust funds, escrow accounts and cash deposits)

Characteristics

A charge (or security) in favour of the competent authorities is taken over an asset (or assets) belonging to the resource user (or, potentially, a company or companies affiliated to them). This could be done *ex ante* (i.e. before the resource user is allowed to commence activity) or *ex post* (i.e. after the occurrence of environmental damage).

In both cases, the competent authorities would need to exercise the power of sale conferred by the charge to recoup the funds secured by it.

Assets such as real estate are particularly ripe for such a charge. Other valuable assets, such as heavy machinery, stock or vehicles, may also be suitable where there is a buoyant secondary market for their resale.

Strengths

- Charges on assets provide a secure means of evidencing financial provision in the event of the resource user's entry into bankruptcy or its financial deterioration. If the financial condition of the resource user deteriorated and it later succumbed to bankruptcy proceedings, a competent authority with a charge over heritable property (i.e. real estate) would have direct recourse to that asset if full payment had not been made. There would be no need to compete with the company's other creditors. A first-ranking fixed charge affords competent authorities the greatest protection as the competent authorities would be paid prior to i) satisfaction of any other charge secured over the asset; and ii) the company's general creditors. Consequently, where the resource user was unable (or unwilling) to undertake the works itself, the existence of the charge, or the potential to take one, could give the competent authority comfort to undertake the works itself.
- Charges over assets result in sufficient financial provision where there is adequate value in the asset to bear the full costs associated with the environmental obligations (e.g. as determined by the direct method of assessment under the Kazakh Environmental Code).
- Funds can be released from an illiquid asset (i.e. real estate) and dedicated to financial provision for the resource user's potential environmental liabilities.
- The value of the asset subject to the charge will not, generally, be impacted by the financial deterioration/bankruptcy of the resource user.
- Lenders could combat the prospect of their charges losing priority by requiring borrowers to hold environmental impairment liability insurance throughout the period of the loan. In essence, the private sector could mandate that resource users hold insurance as opposed to it being mandated by the state.

Weaknesses

- The competent authority must exercise the power of sale conferred by the charge and find a purchaser to realise the funds. Therefore, its ability to recover its costs will be dictated by prevailing market conditions and, perhaps most importantly, demand for that particular asset; the less marketable the asset, the lower the

prospect of a prompt sale at a price which it was expected to achieve (and vice versa).

- The specialist nature of certain industrial premises may result in the market being narrower and less active than other sectors of the commercial property market. This means it may take some time for the property to sell, delaying the time in which value may be realised from the asset. Thus, charges over assets may not result in the secured funds being available when required.
- Prioritising the charge in favour of the competent authority over a charge in favour of a third party, such as a commercial lender, is a decision that a debt owed to society is to be prioritised to a debt owed to the resource user's creditors. This may be controversial where there is a creditor whose charge, having been overreached by a competent authority's charge, no longer secured the entire debt owed to it.
- The competent authority's charge would deplete the pool of assets available to unsecured creditors upon the resource user's entry into bankruptcy proceedings. There may be policy concerns associated with this.
- Prior-ranking charges will inhibit the protection afforded by the measure in that there may be insufficient equity in the asset to accommodate all charges.
- The value of the asset could decline, decreasing the security afforded to the competent authority.

Risk transfer (insurance, letters of credit, bank guarantees and surety bonds)

Characteristics

Insurance

It enables risk-averse parties to transfer the prospect of a large financial liability for environmental damage to an insurer for a comparatively small fee. The insurer charges a premium – the fee paid for the risk of loss to be removed – for coverage that reflects the level of risk posed by the resource user to the pool.

Letters of credit, bank guarantees and surety bonds

A third party (the "provider") agrees to meet a predetermined level of the resource user's environmental obligations; the risk of those obligations not being fulfilled by the resource user is transferred to the provider. The trigger for this to occur may vary between the measures.

They are likely to be granted for annual terms. However, they may be extended automatically subject to the purchaser's continuance as a low credit risk and adherence to the contractual terms.

Strengths

Insurance

- Where an insured risk materialises and the insurer meets the claim of the policy-holder, this will, within the confines of the policy's terms, provide a source of private funds through which environmental damage may be remediated. Where this occurs, insurance implements the remedial function of the Polluter-Pays Principle.

- Where an insurance premium can be adjusted to accurately reflect changes in the environmental risks associated with engaging in a particular activity (i.e. differentiated), it may provide market-based incentives for resource users to adopt safer practices.

Letters of credit, bank guarantees and surety bonds

- The provider will, typically, be subject to direct liability under the instrument and will be required to meet its contractual obligations even if the resource user becomes bankrupt. They are, therefore, secure in the event of the resource user's bankruptcy.
- As the guarantee is provided by an independent financial institution as opposed to the resource user or a company affiliated to it, there is no connection between the resource user's financial health and that of the provider.
- The funds will also, presuming that the provider does not refuse to pay out for a particular reason, be available when required.
- When coverage of the product is sufficient to meet the costs associated with the obligations required by the resource user, public funds need not be used to undertake them.
- The specified level of funds will be available from the outset, avoiding the dangers of waiting for funds to accumulate.

Weaknesses

Insurance

- Under traditional liability insurance, insurers will only cover an insured risk where liability can be established. Difficulties in establishing causation, for example, may prevent liability insurance from providing funds for remedial measures. Even where liability can be established, insurers are also unlikely to cover all costs for all activities. Limits and sub-limits to indemnity, deductibles, conditions, exclusions, specific policy periods and triggers mean that insurance does not ensure coverage of an insured's losses.
- Intentionally caused harms, criminal activity and intentional violations of statutes or regulations are often excluded from all liability insurance policies. This means a typical insurance policy may not cover the intentional emission of pollution to air, in contravention of the emission limits in a permit. Such exclusions are understandable from the insurer's perspective as they provide a crucial means to reduce moral hazard. However, resource users under significant financial pressure may intentionally cut corners to reduce operating costs. In such a situation, there is significant scope for coverage under the policy to be refused.
- Coverage is determined *ex ante* under the insurance contract, while restoration requirements are controlled *ex post* by competent authorities. Therefore, the policy may not cover certain restoration requirements.

Letters of credit, bank guarantees and surety bonds

- Guarantees are usually renewed annually. Therefore, there is the risk each year that guarantees may not be renewed. If this occurs, the financial provision may fall away. This leaves the resource user to find an alternative means of evidencing its

capacity to bear its environmental liabilities. This may prove troublesome where its financial strength has weakened. However, the terms of the instrument could, in theory, require the provider under contract to pay out where the product is not renewed.

- The price accorded by measures such as surety bonds and bank guarantees bear no relation to the resource user's environmental risk; they are priced according to the risk of the resource user becoming insolvent (i.e. its financial risk). These measures do, however, motivate the resource user to remain financially strong so as to benefit from lower price products from third parties. While, in itself, this should be viewed as a positive thing, it creates no substantive motivation to reduce environmental risk.

Financial test (self-insurance, self-bonds and parent company guarantees)

Characteristics

With this category of measures, which includes self-insurance, self-bonds and parent company guarantees, a resource user (or a company with whom it is affiliated, such as its parent company) must meet specified criteria to show its financial net worth or credit rating.

The assumption is that large, profitable companies are able to bear their environmental liabilities without the need to involve unaffiliated third parties, such as financial institutions.

Strengths

- Where a surplus exists between the funds available to the resource user (or the party which has satisfied the financial test) and the costs associated with the environmental obligations to which it is subject, these measures will enable the resource user to meet those obligations in full.
- As regards the parent company guarantee, it contractually overrides the publicly ordered limitation on the parent company's liability for environmental liabilities arising from its subsidiary's activities (i.e. the conferral of limited liability to shareholders under domestic corporate law). It creates a default target for the competent authority should the resource user be unable to meet the requisite costs. This achieves by contract what veil piercing and other liability extending mechanisms (e.g. the interpretation of the relevant statutory language so as to capture the parent) seek to achieve through judicial discretion.
- Self-insurance (i.e. satisfaction of financial tests) motivates the resource user to remain financially strong so as to remain exempt from the need to purchase expensive products, such as insurance, from third parties. This should be viewed positively.

Weaknesses

- When competent authorities accept financial test-based measures as evidence of financial provision, they do not demand that the resource user (or affiliated company) set aside assets or funds to cover environmental obligations. No financial provision in the truest sense of the phrase is actually made; no funds are provided, prepared or arranged in advance of the works. It is a financial illustration of an

ability to pay. This means that the resource user (or affiliate's) assets and funds will be available to its creditors should it enter into bankruptcy; they are inherently insecure as a result.

- The parent company guarantee is a mere unsecured, contractual obligation to pay. The parent company may have suffered financially, perhaps as a result of the resource user's financial deterioration. This could affect its ability to meet the resource user's environmental obligations. It is, therefore, neither secure nor guaranteed to be sufficient in the event of the resource user's bankruptcy.
- Self-insurance (i.e. satisfaction of financial tests) accords no price whatsoever to the resource user's activities and so to its environmental risk; that is the beauty of it for those resource users large enough to benefit. It creates no substantive motivation to reduce environmental risk.

Compensation funds

Characteristics

The fund will, generally, pay for remediation, compensate claimants and may also permit fund administrators to pursue the offending resource user(s) for reimbursement of remediation/clean-up expenses.

The main source of finance of compensation funds is likely to derive from taxes or charges against resource users engaged in the regulated activity. However, this could be supplemented by public funds.

Funds are typically created to deal with a particular type of environmental hazard such as oil spills or storage of hazardous waste. They could conceivably be used in relation to the environmental damage caused by emission of pollutants to air, as per the Dutch Air Pollution Fund.

There are two main types of funds relevant to the present report:

- Guarantee funds complement civil and/or administrative liability regimes and other financial provision measures by protecting competent authorities against the possible bankruptcy of a resource user (or the provider of their financial provision, e.g. an insurer or a bank).
- General funds, in contrast, may operate as an alternative to liability and insurance.

Strengths

- Where a compensation fund is privately financed, it has the capacity to ensure that private funds can be drawn upon to undertake the necessary remedial measures.
- If the associated costs are high, it may not be possible to recover all of these costs from a single resource user. A compensation fund could assist in providing full compensation to the government of Kazakhstan or a private claimant.
- Improved levels of safety within a particular industrial sector could be achieved through imposing requirements upon resource users who wished to obtain membership of the fund. For instance, they could be required to take preventive measures before being accepted as a member of the fund, e.g. obtain particular certification (e.g. ISO 14000 certified or registered in the EU Eco-Management

Audit System [EMAS Programme]). Alternatively, resource users who wished to join the fund could be required to provide evidence of a predetermined level of financial provision, such as insurance.

- Where fund administrators can differentiate the risk associated with the individual resource user through its contributions, then resource users will possess the requisite incentive to improve safety precautions and, consequently, prevent environmental damage arising from their emissions to air.

Weaknesses

- The actual polluter does not pay, or more accurately, does not pay in full. The resource user and the industry covered by the fund share the cost of environmental damage. Thus, they appear to run counter to the true aim of the Polluter-Pays Principle and, consequently, the normative justifications for the frameworks of environmental liability based on it.
- Funds often exhibit bureaucratic inefficiencies, which hinder the ability of claimants to gain compensation readily.
- Fund maintenance may be difficult and the ability to obtain contributions from the relevant industrial sector relies on continued political will.
- If a resource user was permitted to pass its liability on to the fund and carry on as usual, not only would the Polluter-Pays Principle be implemented inadequately but there would be little incentive to reduce the risks, which it exhibited. The fund could, however, be conferred the right to pursue a cost recovery action against the responsible resource user.
- Accurate differentiation may be difficult meaning that there will be a reduced incentive upon resource users to prevent environmental damage. If the contribution is determined by a flat rate or by volume of product produced (e.g. cents per barrel), then large, safe resource users are penalised as smaller, potentially less safe resource users will not contribute in proportion to their prospective loss.
- A failure to differentiate ignores safety precautions by individual resource users, rendering it unlikely that they will be encouraged to exceed legally mandated minimum safety requirements.

Annex F. Terminology

The report uses several other terms, which are listed below to ensure a common understanding of the concepts, approaches and methods used for environmental protection in OECD members, the European Union and in Kazakhstan.

Abatement cost refers to expenditures, which reduce the direct pressures on natural assets (for example from air emissions or waste disposal). The calculation of imputed abatement costs does not require the definition of absolute environmental quality levels or standards but of reductions in levels (for residual flows in particular). Ideally, imputed abatement costs should always be calculated as the sum of direct and indirect cost effects of additional prevention measures.

Best available techniques (BAT) encompass different terms and definitions in OECD member countries.

- The European Union (EU) Industrial Emissions Directive (2010) defines BAT as "the most effective and advanced stage in the development of activities and their methods of operation, indicating the practical suitability of particular techniques for providing the basis for emission limit values and other permit conditions designed to prevent and, where this is not practicable, to reduce emissions and the impact on the environment as a whole". More specifically, "Best" means that the techniques are the most effective in achieving a high general level of protection of the environment as a whole. "Available" refers to the development on a scale that allows implementation in the relevant industrial sector, under economically and technically viable conditions. "Techniques" are both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned. To help authorities, businesses and other interested parties determine BAT, the European Commission organises an exchange of information between experts from the EU member states, industry and environmental organisations. BATs are determined by a technical working group steered by the European IPPC Bureau. This process results in a Commission Implementing Decision establishing the **BAT conclusions** for each sector, which are laid out in the **BAT reference document** (BREF).
- Some countries also include innovative and cutting-edge techniques among their BAT. Some policies do not refer to BAT, but rather point to other similar concepts, such as available techniques, Best Available Control Technology, Best Techno-Economically Available Techniques and Best Practical Options.
- In this report, for the sake of consistency and simplicity, the term BAT refers both to BAT and all similar concepts.[1]

Damage (environmental) is an environmental harm, or risk of harm, caused by activities by an organisation, for which remediation may be needed and cost recovery required. Environmental damage should be clearly distinguished from financial damages, which are financial losses or costs arising from many different causes. Some of these causes may be environmental impacts arising from regulated activities.

Damages (fault-based) is an approach used by the regimes in Kazakhstan and Eastern Europe, Caucasus and Central Asia in which financial penalties are applied to (any) non-compliant activity (typically breaches of emission limits set in permits). It assumes that environmental damage has been caused, whether this has actually happened. The OECD defines "fault-based" damages as penalties or payment imposed for violating a law or breaching a limit, and not simply the absence of a need to prove negligent or intentional conduct.

Emissions cover substances emitted into environment media (air, water, soil) usually from industrial or agricultural processes. The focus of this report is mainly on emissions into air from industrial stationary sources.

Emission limit values (ELV) are absolute limits for emissions, set for a specific sector. For specific installations, ELV are set out in permits as conditions. ELV shall be based on BAT, without prescribing a technology. The competent authority shall, at least annually, assess the results of emission monitoring to ensure that emissions under normal operating conditions have not exceeded the **BAT-AEL (Associated Emission Levels)**. These are ranges of emission levels obtained under normal operating conditions using a best available technique or a combination of BAT, as described in BAT conclusions. They are expressed as an average over a given period, under specified reference conditions. Kazakhstan might use the concepts of maximum permissible emissions for an operator (MPE) or maximum permissible discharges for a project (MPD).

End-of-pipe solutions are methods used to remove already formed contaminants from a stream of air, water, waste, product or similar. These techniques are normally implemented as a last stage of a process before the stream is disposed of or delivered.

Environmental Code (as amended) is the document that codifies the environmental legislation in Kazakhstan. The first version was published in 2007. A significant number of amendments have been introduced into the Environmental Code (62 times over 2007-17). The main objective of the environmental legislation is to promote sustainable development of the country, including the transition to a green economy, to ensure a healthy and supportive environment for present and future generations. This codification attempt has been rather successful, making environmental legislation easier to use and understand by public authorities, businesses and the public. Codes in Kazakhstan have a higher legal value than laws, which brings an indisputable value to this codification effort. In 2011, the Law on Amendments to Legislation related to Environmental Issues introduced amendments to eight legal acts and added two new chapters into the Environmental Code on the regulation and assessment of greenhouse gas (GHG) emissions and capture. The amendments also referred to waste management and environmental audit (UNECE, 2019[10]).

Environmental taxes, a subset of market-based instruments, are taxes "whose tax base is a physical unit (or a proxy of it) that has a proven specific negative impact on the environment. Four subsets of environmentally related taxes are distinguished: energy taxes, transport taxes, pollution taxes and resources taxes" (OECD, 2005[11]). Tradable pollution permit systems, henceforth emissions trading systems, similarly put a price on processes or products with a proven negative environmental impact. It may be worth noting that the definition of environmental taxes does not explicitly link the tax to the size of the environmental damage, or the external cost, but instead only refers to the tax base. Nevertheless, environmental taxes are often implicitly understood to be taxes that aim to improve alignment of tax rates with (marginal) external costs (OECD, 2017[12]).

Environmentally related taxes (ERT) are defined as "any compulsory, unrequited payment to general government levied on tax-bases deemed to be of particular environmental relevance" (OECD, 2004[13]). Here too, there is no explicit connection to external costs. That is to say, environmentally related taxes "particularly affect the environment" whether this is the policy intention or not, and whether tax rates align with external costs or not. In the remainder of this report, the term environmentally related taxes will be used except when there is reference to marginal external cost pricing alone. This term is preferred because alignment with marginal external costs is one of several potential policy objectives that influence tax rates, meaning that referring to environmental taxes is potentially too narrow to describe policy practice now and going forward (OECD, 2017[12]).

In Kazakhstan, a payment is only considered to be a tax if it is stipulated by the Tax Code. In the case of pollution from stationary sources (e.g. industrial plants), taxes are levied based on each enterprise's ELV. They are calculated both for emissions within the ELV and above the ELV. Authorities may impose administrative non-compliance payments/penalties for pollution exceeding the ELV set in project documents and environmental permits. In addition to taxes and administrative penalties, emissions of pollutants above the permitted ELV are subject to monetary damages via a judicial system.

In the remainder of this report, we will thus refer to environmental payments or environmentally related taxes interchangeably for three types of payments:

- Environment payments for emissions within the emission limits (**environmental taxes/charges or pollution taxes)**, as a tax payment for authorised emissions, and are defined in the Tax Code.
- **Non-compliance payments/penalties**, which are paid for emissions above the emissions limits and set in the Administrative Offence Code.
- **Monetary pollution damages**, which are a monetary compensation for environmental damage, for example from industrial air pollutants. They are defined in the Environmental Code (as amended). The Government Resolution №2 535 dated 27 June 2007 provides the detailed calculation method.[2] Although, as analysed in Chapter 3, monetary pollution damages have no links with "the state budget funds" in OECD member countries. Such compensations are not funds to be collected by the state. Instead, the remediation is usually conducted by the party responsible for the damage under an administrative or court order.
- Other environmentally related taxes relate in Kazakhstan to **transport or usage of natural resources**. However, they are not part of the scope of this report, which is focused on industrial air pollutants.

Environmental ambient quality standards (EQS) lay down the maximum allowable concentration of a substance in air, soil or water. Environmental quality standards can be introduced nationwide or for particular geographical areas, such as counties or municipalities. The starting point for an environmental quality standard can be knowledge of what human beings and the natural environment can withstand. The standards may also be seen as policy instruments for achieving the environmental quality objectives in the long term.

Environmental non-compliance response comprises any actions taken by the competent government authority alone or in co-operation with other institutions to correct or halt behaviour that fails to comply with environmental regulatory requirements (OECD, 2009[14]).

- Non-compliance responses may be designed to perform one or more functions, such as: return the violator to compliance; correct internal company management problems that may result (or have resulted) in negative environmental impacts; impose a sanction to punish the violator while also deterring others; remove the economic benefit of non-compliance; or correct environmental damages.
- The common classification of non-compliance responses is based on the different branches of law authorising each measure (i.e. the type of liability): administrative, civil and criminal. **Administrative measures/penalties** are applied by a government agency. **Civil and criminal measures** are imposed, respectively, by **civil and criminal courts** and are sometimes referred to as **judicial response**. The general purpose of administrative enforcement is to restore compliance. Civil enforcement generally addresses damage caused to persons or property. For example, civil judicial enforcement in the United States is intended to punish and deter and does not seek compensation for private parties. Criminal enforcement seeks penalties (that may include prison time for individuals) for egregious unlawful behaviour.

Industrial facility consists of several installations.

Installation represents a site-associated equipment and processes regulated under an environmental permit, for example as specified by the Industrial Emissions Directive. In this report, the term plant might also be used.

Liability for environmental damage or **environmental liability** in most OECD member countries, and in EU legislation, obliges the responsible party to bear the costs of restoring the environment. This would entail restoration to its original state prior to damaged caused or, where this is not possible, to provide for restoration of an equivalent amount and/or level of natural resource or environmental services. The assessment of environmental damage in the OECD is primarily based on resource equivalency analysis to estimate the needs and costs of restoring affected resources or environmental services. The remediation scope may be mandated by law or left to the discretion of the competent authority. Such an authority would determine specific measures using criteria such as technical feasibility, effectiveness and efficiency.

Maximum allowable concentrations (MAC) are binding limits for all users of a given environmental medium, such as air.

Market-based instruments (MBI) are one of several categories of environment policy instruments. They "[…] seek to address the market failure of 'environmental externalities' either by incorporating the external cost of production or consumption activities through taxes or charges on processes or products, or by creating property rights and facilitating the establishment of a proxy market for the use of environmental services" (OECD, 2007[15]). This definition refers to "internalisation of external costs", which ensures the damage caused by pollution is reflected, or at least better reflected, in market prices. Market-based instruments are different from regulation-based approaches to reducing environmental damage, as the latter do not directly modify prices, even if compliance of course is costly in general. OECD analysis explained why price-based instruments tend to reduce pollution at lower costs than regulations (OECD, 2017[12]).

Natural resource damage assessment is a process that emphasises remediation measures following damage to the environment to offset the loss of natural resources and their services rather than merely seeking to collect monetary damages from the polluter.

Polluter-Pays Principle is the principle according to which the polluter should bear the cost of measures to reduce pollution according to the extent of either the damage done to society or the exceeding of an acceptable level (standard) of pollution (see Box 2.1)**.**

Primary, complementary or compensatory remediation. Primary remediation, as understood in the context of the EU Environmental Liability Directive for instance, seeks to return the damaged natural resources and/or impaired services to, or towards, baseline condition (Bullock and O'Shea, 2016[16]).

- **Complementary remediation** addresses the fact that primary remediation may not result in fully restored damaged natural resources/services. It seeks to provide a level of natural resources and/or services similar to that which would have been provided if the damaged site had been returned to its baseline condition.
- **Compensatory remediation** refers to action to compensate for interim losses of natural resources and/or services that occur from the date of the damage to when primary remediation is complete. This compensation consists of additional improvements to protected natural habitats and species or water at either the damaged site or at an alternative site, not financial compensation to members of the public.

Operator is defined as any natural or legal, private or public person who operates or controls the occupational activity or, where this is provided for in national legislation, to whom decisive economic power over the technical functioning of such an activity has been delegated. This includes the holder of a permit or authorisation for such an activity or the person registering or notifying such an activity. This report might also refer to a **resource user** or an **operator of regulated activities.**

Notes

[1] The term "techniques", as referred to in this report, relies on the definition used in the EU Industrial Emissions Directive. It describes techniques as both (i) the technologies used by industrial installations; and (ii) the way in which installations are designed, built, maintained, operated and decommissioned. The OECD recognises the important distinction between techniques for prevention versus control of industrial emissions. The BAT documents referred to in this report include both prevention and control techniques.

[2] With amendments and additions as of 21 June 2016. See http://adilet.zan.kz/rus/docs/P070000535_. Only Kazakh and Russian versions are available.

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