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Environmental Performance Reviews

ITALY



ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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ITALIE

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FOREWORD

The principal aim of the OECD's Environmental Performance Reviews is to help *member countries improve their individual and collective performances in environmental management*. The primary goals for this programme are:

- to help *individual governments* assess progress;
- to promote a continuous policy *dialogue among member countries*, through a peer review process; and
- to stimulate *greater accountability* from member countries' governments towards their public opinion, within developed countries and beyond.

Environmental performance is assessed with regard to the degree of achievement of *domestic objectives and international commitments*. Such objectives and commitments may be broad aims, specific qualitative goals, precise quantitative targets or a commitment to a set of measures to be taken. Assessment of environmental performance is also placed within the context of historical environmental records, the present state of the environment, the physical endowment of the country in natural resources, its economic conditions and demographic trends.

These systematic and independent reviews have been conducted for all member countries as part of the first cycle of reviews. The OECD is now engaged in the second cycle of reviews directed at *promoting sustainable development*, with emphasis on implementation of domestic and international environmental policy, as well as on the integration of economic, social and environmental decision-making.

The report was peer-reviewed by the Working Party on Environmental Performance (Paris, June 2002). The conclusions and recommendations of the report are approved by the Working Party.

GENERAL INTRODUCTION

This review of Italy's environmental performance *examines results* in the light of domestic objectives and international commitments. It reviews progress since the previous OECD Environmental Performance Review of 1994. It also evaluates progress with respect to objectives of the 2001 OECD Environmental Strategy.

The report is organised in three parts:

- Part I is entitled: “Environmental Management” and focuses on air, water, and waste management, as well as nature conservation and biodiversity;
- Part II is entitled: “Sustainable Development” and focuses on environmental policy integration in the economy, in social policies and in the transport sector;
- Part III is entitled: “International Commitments” and focuses on international co-operation.

The OECD extends its most sincere thanks to all those who helped in the course of this review, to the representatives of member countries to the Working Party on Environmental Performance, and especially to the examining countries (Finland, Portugal, the United Kingdom and the United States) and their experts. The OECD is particularly indebted to the Government of Italy for its co-operation in expediting the provision of information and the organisation of the experts' mission to Italy, and in facilitating contacts with many individuals both inside and outside administrative and governmental structures of the country.

The OECD Working Party on Environmental Performance conducted the review of Italy at its meeting on 17-19 June 2002 and approved its conclusions and recommendations. This report is published under the authority of the Secretary-General of the OECD.

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ABBREVIATIONS AND SIGNS

Abbreviations

AAMA	American Automobile Manufacturer's Association
ACCOBAMS	Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area
ACEA	Rome's municipal water and electricity utility
ACI	Italian Automobile Club
ADRICOSM	Adriatic Sea Integrated Coastal Area and River Basin Management System
ANCI	National Association of Italian Municipalities
ANCMA	National Cycle, Motorcycle and Accessories Association
ANDREA	National archive of documentation and research for environmental education
ANFORA	National database on environmental education and training
ANPA	National Environmental Protection Agency
APME	Association of Plastics Manufacturers in Europe
APPA	Provincial Environmental Protection Agencies
ARE	Federal Agency for Territorial Development (Switzerland)
ARPA	Regional Environmental Protection Agency
ATO	Optimal Management Area
BAT	Best available technology
BOD	Biochemical oxygen demand
CAOS	Co-ordinated Adriatic Observing System
CAP	Common Agricultural Policy (EU)
CBD	Convention on Biological Diversity
CEPI	Confederation of European Paper Industries
CFCs	Chlorofluorocarbons
CFS	State Forest Corps
CH ₄	Methane
CIPE	Inter-Ministerial Committee for Economic Planning
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CNR	National Research Council
CO	Carbon monoxide
CO ₂	Carbon dioxide

COBAT	Obligatory consortium for recovery of used lead-acid batteries and other lead waste
COD	Chemical oxygen demand
CONAI	National packaging material consortium
CSF	Community Support Framework (EU)
DLg	Legislative Decree
DO	Dissolved oxygen
DPEF	Document of Economic and Financial Planning
DSTN	Department for National Technical Services
EAGGF	European Agricultural Guidance and Guarantee Fund
ECMT	European Conference of Ministers of Transport
EDEN	Enhanced Database of Endangered Species
EIA	Environmental impact assessment
EMAS	Eco-Management and Audit Scheme (EU)
EMU	European Monetary Union
ENEA	National Agency for New Technology, Energy and the Environment
ENEL	National electric power utility
EPD	Environmental Product Declaration
EPR	Environmental Performance Review
ERDF	European Regional Development Fund (EU)
FEVE	European Glass Container Federation
GFCM	General Fishery Council for the Mediterranean
GHG	Greenhouse gas(es)
HCFCs	Hydrochlorofluorocarbons
IBE	Extended Biotic Index
ICCAT	International Commission for the Conservation of Atlantic Tuna
ICCD	Italian Committee to Combat Desertification
ICHD	Italian Clearing House on Desertification
ICRAM	Central Institute for Scientific and Technological Research Applied to the Sea
IEA	International Energy Agency
IMO	International Maritime Organisation
IMPEL	Network for the Implementation and Enforcement of Environmental Law (EU)
INAIL	National Institute for Occupational Health
INFEA	Environmental information, training and education programme
INFS	National Wildlife Institute

INGV	National Institute for Geophysics and Volcanology
IPPC	Integrated pollution prevention and control
IRF	International Road Federation
ISO	International Organisation for Standardisation
ISS	National Institute of Health
ISTAT	National Statistical Institute
IUCN	World Conservation Union
IWSA	International Water Supply Association
LBS	Land-based sources
LIM	Broad Pollution Level
LPG	Liquefied petroleum gas
LRTAP	Convention on Long-range Transboundary Air Pollution
LUCF	Land use change and forestry
MAGP	Multiannual Guidance Programme
MAP	Mediterranean Action Plan
MARPOL	International convention for prevention of pollution from ships
MATT	Ministry of the Environment and Land Protection
MBAC	Ministry of Cultural and Natural Heritage
MEDALUS	EU Mediterranean Desertification and Land Use
MEDPOL	Programme for the assessment and control of pollution in the Mediterranean region
MEF	Ministry of the Economy and Finance
MCSD	Mediterranean Commission on Sustainable Development
MIT	Ministry of Infrastructure and Transport
MUD	Obligatory annual waste declaration
Mt	Million tonnes
Mtoe	Million tonnes of oil equivalent
MVOCs	Methane volatile organic compounds
NGO	Non-governmental organisation
NH ₃	Ammonia
NMVOCs	Non-methane volatile organic compounds
NO _x	Nitrogen oxides
NOE	Operational Unit for Environmental Protection of the Carabinieri
O ₃	Ozone
ODA	Official development assistance
ODS	Ozone depleting substance(s)
OPEC	Organisation of the Petroleum Exporting Countries
OPRC	Convention on Oil Pollution Preparedness, Response and Co-operation

P	Phosphorous
PAC	Pollution abatement and control
PAHs	Polyaromatic hydrocarbons
PAI	Hydro-geological risk plan
PCBs	Polychlorinated biphenyls
PCTs	Polychlorinated terphenyls
PD	Presidential Decree
PFC	Private final consumption
PGT	General Transport Plan
PGTU	General Urban Traffic Plan
PM	Particulate matter
PNA	National action programme to combat drought and desertification
POMA	Multi-regional Environment Operative Programme (EU)
POPs	Persistent organic pollutants
PPP	Polluter-pays principle
PPP	Purchasing power parity
PRISMA	Adriatic Sea research and experiment programme
PSM	Mezzogiorno Development Plan
PUM	Urban Mobility Plan
PURG	General regional urban plan
PUT	Urban Traffic Plan
RAMOGE	St. Raphael, Monaco and Genoa agreement
SAP	Strategic Action Programme
SCI	Site of Community Importance
SEA	Strategic Environmental Assessment
SECA	Ecological State of Watercourses
SINANet	National environmental information and monitoring system
SINCERT	National accreditation scheme for certification bodies
SMAP	Short and Medium-term Priority Environmental Action Programme
SMEs	Small and medium-sized enterprises
SO ₂	Sulphur dioxide
SO _x	Sulphur oxides
SPA	Special Protection Area
SPAMI	Special Protection Area of Mediterranean Importance
STA	Rome's traffic management agency
TAC	Total allowable catch
TARSU	User charge for municipal waste collection and disposal
toe	Tonnes of oil equivalent

TPES	Total primary energy supply
TSP	Total suspended particulates
UNCCD	Convention to Combat Desertification – United Nations
UNFCCC	Framework Convention on Climate Change – United Nations
USD	US dollar
VAT	Value added tax
VOCs	Volatile organic compounds
WHO	World Health Organisation
WWF	World Wildlife Fund (NGO)

Signs

The following signs are used in Figures and Tables:

- .. : not available
- : nil or negligible
- . : decimal point

Country Aggregates

OECD Europe: All European member countries of the OECD, i.e. countries of the European Union plus the Czech Republic, Hungary, Iceland, Norway, Poland, the Slovak Republic, Switzerland and Turkey.

OECD: The countries of OECD Europe plus Australia, Canada, Japan, the Republic of Korea, Mexico, New Zealand and the United States.

Country aggregates may include Secretariat estimates.
The sign * indicates that not all countries are included.

Currency

Monetary unit: Euro (EUR)
In 2001, EUR 1 = USD 1.114

Cut-off Date

This report is based on information and data available up to February 2002.

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1

CONCLUSIONS AND RECOMMENDATIONS*

Italy has a large economy and a population of 57 million, concentrated on a relatively small territory, with strong regional disparities. *High densities* lead to strong environmental pressures which, together with the diversity and sensitivity of Italy's natural patrimony and its important cultural heritage, have made environmental protection a matter of serious public concern.

Priority environmental issues include urban air pollution, soil and water management, waste management, nature and landscape conservation, climate change, transport management, and protection of coastal areas and the marine environment. Measures to cope with hydro-geological risks (flooding, landslides and earthquakes) imply large central budget outlays. With its strong regional disparities, and the largest share of population over 65 years among OECD countries, Italy must find ways to achieve nationally balanced economic, environmental and social development. As a member of the European Union, it must comply with the high standards set out in EU environmental legislation. As a G7 country, it must contribute to raising awareness of global environmental problems.

To meet this challenge, Italy will need to: i) improve its environmental infrastructure (e.g. for water supply, waste water treatment and waste treatment) and the efficiency of its environmental policies; ii) integrate further environmental concerns into economic and social decisions; and iii) reinforce its international environmental co-operation. This report examines progress made by Italy *since the previous OECD Environmental Performance Review* in 1994, and the extent to which Italy's *domestic objectives and international commitments* are being met. It also reviews the country's progress in the context of the OECD

* Conclusions and Recommendations reviewed and approved by the Working Party on Environmental Performance at its meeting in June 2002.

Environmental Strategy.* Some 64 recommendations are made that could help strengthen Italy's environmental performance in a context of sustainable development.

1. Environmental Management

Implementing more effective and efficient environmental policies

In the last ten years Italy has met or almost met a number of its domestic objectives and international commitments (e.g. SO₂, heavy metals and POPs emissions, separate waste collection, nature protection, agri-environmental progress). It has also considerably strengthened its *national environmental institutions*, issued new environmental legislation, and further devolved environmental responsibilities to regional and local authorities while keeping responsibility for strategic planning and legal co-ordination at the central level. The human and budgetary resources of the Ministry of the Environment and Land Protection (MATT) have been increased very significantly; new directorates deal with sustainable development and protection from flooding, landslides and other natural disasters. The National Environmental Protection Agency (ANPA), which provides MATT with scientific and technical support, has been growing. There has been important *progress on environmental legislation* (e.g. water, waste reforms), mainly prompted by EU environmental directives. The competence of regions and local authorities with respect to environmental and land management has been strengthened during the *devolution process* (1997 Bassanini Act). Regional Environmental Protection Agencies (ARPAs) are being established to perform inspection and enforcement on request from regions. Some regions have begun to introduce integrated permitting for existing plants. *Enforcement* of environmental policies benefits from the actions of the Unit for Environmental Protection of the Carabinieri, placed at the disposal of MATT; prosecution for violations of environmental legislation can rely on specialised judges and specific provisions in the criminal code (e.g. concerning water pollution, forest fires). *Environmental impact assessment* of projects, carried out at national level since 1989, has been an effective instrument. From 1996 all regions have been required to issue EIA laws, though today only half the regions have operational EIA procedures. The 1990s saw the development of *economic instruments* and *voluntary agreements*:

* The 2001 OECD Environmental Strategy's main objectives covered in the present Conclusions and Recommendations are: integrity of ecosystems (Section 1), decoupling environmental pressures from economic growth (Section 2), the social and environmental interface (Section 2), and global environmental interdependence (Section 3).

measures were adopted to curb air pollution; a carbon tax was introduced in January 1999; implementation of new, tailored tariffs for waste collection and disposal is in progress in many parts of the country; and reforms are being implemented to improve water management. Eco-auditing schemes and eco-labelling have also been developed.

However, the overall picture is mixed, as Italy has not met a number of its commitments or is not on the way to meet them (e.g. NO_x, NMVOCs, ammonia emissions, several water goals and targets, climate change, ODA). Transposition of EU legislation has often entailed significant delays. The IPPC Directive has not yet been transposed. Despite efforts made, the Italian legal framework remains too fragmented and complex. In many instances, taxes and charges have been set at a modest level and have had only modest environmental benefits. Cost recovery for water and waste services should be improved; progress needs to be made towards implementation of the *polluter pays and user pays principles*. There are important disparities in the environmental institutional

It is *recommended* to:

- raise the level of *investment in environmental infrastructure* by fully disbursing funds allocated to MATT and by seeking additional private funding; increase the rates of environmental charges, non-compliance fines and inspection fees and generalise their use;
- evaluate the *cost-effectiveness* of the mixes of policy instruments in place (economic, regulatory, voluntary, land use planning);
- set *charges* at levels that create incentives and are in accord with the user and polluter pays principles, and explore the potential for pollution trading mechanisms;
- streamline the *legal environmental framework* and facilitate its implementation through setting clear environmental policy targets and implementation deadlines;
- complete the *establishment of ARPAs* and strengthen their role as the main monitoring and inspection bodies;
- further strengthen national EIA procedures and develop *regional EIA procedures* and IPPC permitting;
- strengthen the implementation of, and introduce environmental requirements in, regional *physical planning*, city master planning and building permitting.

capacity and the effectiveness of *regional and local authorities*. Many urban areas in southern Italy do not have city master plans. Some 15 to 20% of buildings are constructed without permits. Regions and provinces make little use of territorial planning for environmental purposes and risk management. An integrated approach to coastal zone management is lacking. There has been a relatively *low level of investment in environmental infrastructure*, possibly linked to delayed decisions associated with the devolution process and low spending capacity in the case of allocated funds.

Air

Italy has made very *significant progress* in improving air quality over the last ten years. While data from the 1990s are far from complete, exceedances of air quality standards for most major pollutants (e.g. SO₂, NO₂, CO) have generally decreased. This progress reflects mainly: i) the great strides made in reducing *emissions from electric power generation*, with the use of cleaner power plants (fuelled by natural gas and, increasingly, by renewable energy resources) and highly efficient combined heat and power plants; and ii) the reduction of emissions of all common pollutants by *industry*, including SO_x, NO_x, CO₂, VOCs from solvents, dioxins and furans, and CO. Italy's progress also reflects significant, though insufficient, reductions in transport sector emissions of NO_x, CO, VOCs and lead, despite large increases in total vehicle-kilometres travelled. Italy has met most (but not all) of its international commitments regarding air pollution, including those for SO_x in the Helsinki and Oslo Protocols and for NO_x in the Sofia Protocol.

However, much remains to be done. Many areas (e.g. urban ones) continue to have poor air quality, particularly with respect to *ozone and fine particulate matter*. Italy's cultural heritage is suffering from the impacts of air pollution. With a strong percentage contribution of total air pollution, *transport* is the sector most in need of further efforts. Italian regions have, with notable exceptions, largely failed to develop air quality plans as required under the 1988 Presidential Decree. Despite significant expansion, the *air quality monitoring* network remains uneven across the country (with unsatisfactory situations, particularly in the South) and for some pollutants (e.g. PM₁₀). Concerning *toxics*, time series are being developed for emissions of some air pollutants such as benzene, dioxins and furans, heavy metals and PAHs; estimates for other air toxics are not available. Under the *Gothenburg Protocol* (to be ratified) and EU Directive 2000/81 on national emission ceilings (to be transposed by the end of 2002), Italy's primary challenge will be reaching the targets for NO_x and VOCs.

It is *recommended* to:

- take steps to reduce *ambient levels of particulate matter and ozone*, with emphasis on measures relating to transport;
- ensure implementation of existing legislation to measure and control *emissions of toxic air pollutants* from industrial sources, with a particular focus on those pollutants and sources that pose the greatest health risks;
- strengthen efforts to meet the targets of the Gothenburg protocols on reduction of emissions of *NO_x and VOCs*;
- complete and implement *regional air quality plans* to serve as primary evaluation and long-term planning tools; these plans should be explicitly and integrally linked to development of other regional and local plans (e.g. transport, energy, mobility);
- extend the use of *economic instruments*, such as emission trading schemes (especially for NO_x), and of *integrated pollution prevention and control* (e.g. plant-wide industrial permit limits);
- complete geographical coverage of the *air quality monitoring* network, extend monitoring of ozone and particulate matter, and improve quality assurance and control of monitoring techniques and data quality;
- accompany *liberalisation in the electricity and natural gas sectors* with strict implementation of energy savings objectives in these two sectors, as well as strict enforcement of the same air emission standards for new and existing power plants;
- promote further actions to develop the use of *renewable energy* in power plants.

Water

Legal provisions were made in the 1994 Galli Act for meeting the key objective of sustainable financing of water infrastructure development. Water legislation was consolidated in a 1999 Legislative Decree transposing key EU directives (e.g. urban waste water treatment, nitrates). *Optimal management areas* (ATOs) are being created within which different municipalities' *water and waste water services* will be consolidated, thereby improving efficiency. Consolidation of water services has begun with the creation of integrated water agencies, often involving direct concessions to companies owned by local governments. A *river basin* approach is applied to *flood and soil erosion*

management; basin authorities are being created, and hydro-geological basin-level plans are being prepared that delineate areas subject to flooding and landslides. In northern Italy, efforts have been made to conserve or replenish water resources, especially in the Po river basin. In southern Italy, innovative demand management measures have been implemented to discourage water use exceeding crop requirements, and collective water supply networks have been established to promote industrial development. Pollutant discharges by the chemical industry have decreased. Bathing water has remained of high microbiological quality.

However, if water reform principles have been adopted (e.g. the Galli Act), *only a start* has been made towards putting them into operation. There has been little progress in meeting the key objective of *acceptable quality of all water bodies* set for 2008, primarily due to very limited investment in urban waste water treatment infrastructure. Milan and several other major agglomerations still do not have sewage treatment plants. Inland water quality has deteriorated in major rivers and aquifers. Contamination by nitrates and pesticides remains of concern, though measures have recently been taken (delineation of vulnerable areas, introduction of a pesticide tax). Substantial *new funding* is required to cover the national deficit with respect to operating costs for water provision and waste water treatment, and to provide for much necessary investment. Specific provisions for such investments were included in the last financial law. Full cost recovery (of investment, operational and maintenance costs) would imply quite significant increases in water prices, which have remained very low by OECD standards. The public budget continues to subsidise collective irrigation schemes, including capital replacement. Low household water prices do not allow for necessary renewal of public water supply systems, and leakage is still high. There is a need to prepare economic analysis of how costs can be covered by tariff reform together with efficiency gains. *Intensity of water use* remains very high. There are still water shortages in the South, mainly resulting from both excessive groundwater abstraction for irrigation and high leakage in water networks. The right institutional framework is needed to address this problem; tradable water abstraction rights could be introduced as appropriate. *Watershed management plans* have not been approved. Regions should seek co-operation with river basin authorities on both water quantity and water quality planning, in line with the requirements of the new EU Water Framework Directive, yet to be transposed.

It is *recommended* to:

- implement legislation according to the new EU Water Framework Directive and strengthen the role of *river basin authorities*;
- mobilise public and private investments to upgrade *urban waste water collection and treatment infrastructure*, in the context of the framework programme agreements between the State and the regions;
- speed up implementation of the Galli Act (e.g. application of *user and polluter pays principles*, consolidation of municipal water and waste water services within optimal management areas);
- implement statutory *water quality objectives* introduced by Legislative Decree 152/1999;
- implement demand management measures for *water resource conservation*, including stricter control of abstraction permits, and increase the use of treated waste water in irrigation;
- prepare *watershed management plans*, including both water quantity and water quality planning, in close consultation with the various stakeholders;
- strengthen prevention and mitigation measures concerning *flood management*; complete *hydrogeological risk plans* for all river basins;
- complete delineation of *areas vulnerable* to nitrate and pesticide pollution from agriculture.

Waste

With the 1997 Ronchi Decree, Italy transposed the EU directives on waste, hazardous waste and packaging waste. A number of specific objectives were adopted regarding *recovery of waste materials* and restriction of landfilling to pre-treated waste only; a waste accounting system was developed at national level. The regions were given responsibility for defining waste management plans to integrate waste collection, treatment and disposal in optimal management areas (ATOs), so as to overcome inefficiencies due to over-fragmentation of waste services. Separate *collection of “urban waste”* and material recovery increased steadily over the decade; in 1999 it almost reached the 15% target set by the Ronchi Decree. Data on “*special waste*” also show increased material and energy recovery, coupled with a decrease in landfill disposal. A private “consortium” was established to co-ordinate and stimulate the recovery and *recycling of different packaging materials*, with positive results (recycling costs are lower than in many other OECD countries). Significant increases have been recorded in the production

of high quality compost from separately collected organic material. *Pricing* of urban waste collection and disposal services (intended to fully cover operating and investment costs on the basis of generated quantities) is being experimented with in a number of municipalities. Economic instruments are being used in the form of product charges levied on producers and importers of virgin materials, to assist in recovering packaging materials, waste oil and used batteries. Voluntary agreements have been launched (e.g. collection and recovery of single-use cameras, “computerised trading of waste” project). A national *inventory of contaminated sites* has been established and priorities have been identified.

While waste management reform has been adopted and its *implementation has begun*, much remains to be accomplished. Despite the stated primary objective of source reduction, per capita *generation of urban waste* has grown continuously since the early 1990s, reaching the OECD average of about 500 kg per capita in 2000. The volume of materials recovered through *separate collection* is still low, largely due to poor results in the central and southern regions; further efforts will be necessary to increase recycling of packaging materials. Large amounts of waste continue to be *landfilled* in small substandard facilities without pre-treatment. Uneven distribution of suitable treatment and disposal facilities is an obstacle to ensuring proper management of hazardous waste without transporting it over long distances. *Hazardous waste exports* were ten times greater in 1999 than in 1993,

It is *recommended* to:

- accelerate the adoption of *regional waste management plans*, including closing down small and unsatisfactory landfills and replacing them with disposal facilities that meet current technical norms and regulatory requirements;
- pursue efforts to increase *separate collection* of urban waste, including packaging materials, and adopt economic and regulatory measures to further develop the *recycling markets and industry*;
- develop the use of economic instruments and voluntary agreements aimed at reducing *waste generation*;
- improve the capacity and quality of *hazardous waste* disposal facilities and their national coverage;
- further improve *waste accounting and monitoring*, with special reference to generation and disposal of special and hazardous wastes;
- implement remediation measures in *contaminated sites* of national importance and speed up completion of regional inventories of contaminated sites.

reaching 6% of total generation. Despite the reorganisation of the Waste Register in 1998, improvements are needed in *waste accounting and monitoring*, particularly with respect to generation, treatment and disposal of special waste. Many regions have not yet prepared a plan for organising integrated *municipal waste management networks within ATOs*. Use of *economic incentives* and other instruments, such as voluntary agreements, to promote waste minimisation and encourage recycling need to be further developed.

Nature conservation and biodiversity

Italy vigorously expanded its *network of protected areas* in the 1990s: total protected land, which doubled over the decade, now covers 9.1% of the territory. During that period annual public expenditure on management of protected areas increased significantly and legislation was passed to further involve regions and local communities in the creation and management of protected areas. Regional protected areas and marine nature reserves are generally well managed; in particular, there is good public perception of and public involvement in management of regional protected areas. The proposed Natura 2000 network covers 16% of Italy's total land area. In 1998 the Inter-Ministerial Committee for Economic Planning (CIPE) decided to create a coherent national ecological network. To strengthen management of *fauna and flora species*, a comprehensive inventory of Italian fauna and an enhanced database on endangered flora species have been created. The 1992 Hunting Act introduced a number of innovations aimed at protecting and managing wildlife. Many animals are now protected under criminal law. Due to the increase in the extent of protected areas and vigorous reintroduction efforts, some large mammal species (including wolves and brown bears) made a strong comeback in the 1990s. The number of farmers participating in *agri-environmental schemes* has grown steadily, accounting for almost 20% of farmland; *organic farming* has developed rapidly and now takes place on 7% of total farmland. Forest management objectives have increasingly been oriented towards protection of ecological, social and aesthetic values. With EU support for forestry plantations on abandoned farmland, forested areas increased by 1.3% during the 1990s. They now cover about 23% of the territory. Intensity of use of forest resources (i.e. harvest divided by annual growth) has remained low, at 27%. In 2000 a Framework Act on Forest Fire Prevention was enacted. Italy has prepared a National Action Programme to Combat Drought and *Desertification*. It has also promoted many initiatives to increase public awareness of desertification. Regions and river basin authorities have developed their own detailed action programmes. Italy gave its support to *landscape protection* at international level by hosting the European Landscape Convention in Florence.

Despite this real progress, much remains to be done in view of the *high pressures on natural assets from economic activities*. Many of Italy's 1 200 vertebrate and 5 600 vascular plant *species are threatened*. One-third of forest trees are moderately to seriously affected by defoliation. Some 5.5% of the territory is vulnerable to desertification. Italy should finalise its National Biodiversity Strategy to create a framework for managing fauna and flora species. Fully operationalising the management of national parks should be strengthened. It is necessary to complement designation of Natura 2000 sites to improve ecological coherence (e.g. ecological corridors, buffer zones). Recently created *marine nature reserves* represent only a small share of coastal areas, and pressure on coastal ecosystems from tourism infrastructure development is increasing. There is an urgent need to protect *coastal areas* that are still well preserved. There is also a need to increase *expenditure on nature conservation*, including to protect biodiversity in small islands and in protected areas, for instance through increased reliance on economic instruments (e.g. access fees). In the second half of the 1990s public expenditure on nature conservation was equivalent to one-quarter of agri-environmental payments to farmers, which in turn represented less than 3 to 4% of total EU budgetary support to Italian agriculture and rural development. Nearly 47% of the territory falls within the scope of the 1985 *Landscape Protection Act* (Galasso Act), but regional landscape plans consist only of broad recommendations. Provinces should introduce territorial planning to ensure better co-ordination between landscape planning by regions and green space planning by municipalities.

It is recommended to:

- complete the *National Biodiversity Strategy*;
- protect still *preserved coastal areas* and apply strict nature conservation measures in these areas;
- develop appropriate partnerships between the national administration and regions, municipalities and civil society, in order to *improve management of national and regional parks*;
- establish a coherent national ecological network, increase *expenditure on nature conservation*, including by increased reliance on economic instruments;
- evaluate the effects of *agri-environmental and farm forestry schemes* on nature conservation;
- fully implement and enforce *landscape protection acts and regulations*;
- strictly enforce *physical planning and environmental regulations* for new buildings and construction projects.

2. Towards Sustainable Development

Integration of environmental concerns in economic decisions

Italy has continued to make good progress in *decoupling* environmental pressures from economic growth, through low energy intensity and reduction of SO_x and NO_x emissions as well as through reduction of phosphate fertiliser and pesticide use. *Institutional integration* has improved. Progress in environmental planning is being achieved through preparation of the Environmental Strategy for Sustainable Development. Strategic Environmental Assessment has been developed as a tool to promote sustainable development (e.g. General Transport Plan). *Market-based integration* continues to rely on high energy prices (due to taxes and historically high pre-tax energy utility prices), which have yielded environmental benefits; Italy's *energy intensity is lower than that of any other OECD economy*. Italy also relies increasingly on environmentally related taxes and environmental charges: a carbon tax on mineral/fossil fuels and a pesticide

It is *recommended* to:

- further integrate environmental concerns within *agriculture, energy and transport policies*, as well as health and tourism policies;
- expand the use of *strategic environmental assessment*;
- finalise adoption of the *Environmental Strategy for Sustainable Development*, with quantitative targets and time limits, based on full consultation with various stakeholders;
- review the economic efficiency and environmental effectiveness of *incentive schemes* granted in terms of subsidies, tax rebates or exemptions to various economic sectors;
- review existing *environmentally related taxes* (e.g. transport taxes, taxes on energy products) with a view to restructuring them in the light of a green tax reform;
- foster implementation of *cost recovery schemes* in waste management and extend such schemes to water management;
- make more systematic use of *integrated economic and environmental analyses* (e.g. cost-benefit analysis, data on public and private environmental expenditure) in environmental policy-making, with the aim of achieving sustainable development objectives more cost-effectively;
- mainstream *sustainable development* policy into institutional arrangements and decision-making at all levels (central, regional and local).

tax have been phased in; vehicle taxation has shifted to take greater account of environmental impacts (e.g. through being calculated on engine size); water and waste charges increased significantly in the latter part of the 1990s.

Nonetheless, further efforts are needed to *decouple* municipal waste generation from economic growth. *Co-ordination* among different administrations is not very well established, particularly at the technical level. Involvement of the Inter-Ministerial Committee for Economic Planning (CIPE) in environmental and sustainable development issues is to be encouraged. *Economic analyses* (e.g. cost-benefit analysis) carried out are insufficient to ensure cost-effective achievement of environmental objectives. *Taxes and charges* are not well targeted with respect to emission impacts, and there are many exemptions. Environmentally related taxes have had a low incidence. Some environmental charges are difficult to enforce, while some (e.g. a plastic bag fee) have been abandoned. Water prices are still low; they fall well short of overall operating costs, let alone providing financing for urgently needed capital expenditure. Water for agricultural use is priced extremely low, and groundwater resources are often abstracted illegally.

Integration of environmental and social concerns

Italy has made progress on *environmental information*, access to this information and public participation. Environmental reporting is well established at the national level (e.g. state of the environment *reports*, environmental *statistics*) and a *National Environmental Information and Monitoring System* (SINAnet) has been established. Italy proceeded with early ratification of the *Aarhus Convention*. The right of access to environmental information is laid down by law and is enforceable in the courts. Financial and technical support by MATT has had positive effects on *Local Agenda 21* implementation: over 500 local bodies are now involved, enhancing public participation. Capacity building of regional environmental administration has received support from EU Structural Funds, especially in the South (e.g. task-force of 150 experts to support regional environmental authorities and ARPAs). *Environmental education* has benefited from devolution of powers to the regions, as well as from technical and financial support provided by the national government (INFEA) and EU Structural Funds, especially in the South. Following several *natural disasters*, efforts have been made to assess the risk of such events (e.g. flooding, landslides, seismic and volcanic activity) occurring throughout Italy. *Urban revival* programmes have been implemented (Urban-Italy and national initiatives), leading to better quality of life in the urban environment. Rural development, including organic farming and farm tourism, provides a range of social and environmental benefits. Public

awareness of the potential health effects of *electromagnetic radiation* (e.g. from powerful radio transmissions and high-voltage electric transmission lines) has attracted increased attention from scientists and other decision-makers; precautionary measures (e.g. more stringent standards) have been introduced.

Strong disparities still exist, however, especially between the North and South, in terms of access to environmental services (especially water). Despite successful urban revival programmes, the capacity to draw up, carry out and account for development programmes at the regional and local levels has generally been limited, especially in the South. Concerning *environmental information*, monitoring systems should be reviewed for relevance and consistency: availability of environmentally relevant economic information is weak; integration of regional data at national level suffers from insufficient harmonisation and problems with data flows; citizens are often unaware of their *right to environmental information*. Efforts to develop environmental awareness and public participation are uneven across the country. These efforts are particularly limited in less developed regions. Too little has been done to explore local creation of *environmentally related jobs*.

It is *recommended* to:

- reinforce efforts to reduce *regional disparities in access to environmental services* through development programmes (e.g. environmental infrastructure) in the South;
- further promote *capacity building* (e.g. EU Structural Funds task-force) in project and financial management, and in implementation of the Environmental Strategy for Sustainable Development, at both regional and local levels;
- promote the creation of *environmentally related jobs* (e.g. at local level, in organic farming, in small enterprises);
- review the lessons to be learned from *urban development programmes* carried out so far, and build on positive experiences in future urban revival and Local Agenda 21 projects;
- improve land use planning and building permitting through full use of information concerning exposure to *natural disasters and industrial risks*;
- strengthen *environmental information systems* through extended and improved monitoring, economic coverage (e.g. concerning environmental expenditure) and integration of information from various sources;
- further inform the public about its rights to environmental information, facilitate public *access to environmental information*, and encourage *public participation in decision-making*.

Integration of environmental concerns in transport decisions

Italy has made significant progress in integrating environmental concerns in transport policies and practices. The new General Transport Plan (PGT) has benefited from close co-operation between MATT and the Ministry of Infrastructure and Transport, as well as from strategic environmental assessment. Its objectives aim at *environmentally sustainable transport* and achieving international environmental commitments. Steps have been taken to promote coastal shipping and combined sea-land transport, and more recently to develop transport infrastructure and reform the transport sector. Concerning transport *infrastructure*, environmental impact assessments have often helped mitigate negative impacts on habitats and landscapes. Concerning the *economic and regulatory context*, financial assistance has been made available to promote clean public transport and sustainable mobility in urban areas; economic and fiscal incentives have encouraged use of environmentally friendly fuels and vehicles; road fuel taxes and prices are among the highest among OECD countries. Concerning *traffic*, many cities are innovative, increasingly including reduction of air pollution in comprehensive mobility plans along with public transport measures. Italy has long used road pricing on its motorway network. Concerning *vehicles*, improvements in technology and fuel quality, incentives promoting alternative fuels, low emission vehicles, vehicle scrapping schemes and exhaust emission controls have had environmentally positive effects. Despite increased traffic volumes, most air emissions from road transport have not increased.

Nevertheless, Italy's rate of motorisation is among the highest in OECD countries. Road transport (both passenger and freight) has continued to grow and dominates the modal split; alternative modes tend to lack competitiveness (e.g. public transport, combined road-rail freight transport). The transport sector remains by far the largest contributor to air emissions of NO_x and NMVOCs; transport related CO₂ emissions continue to grow, as do emissions from two-wheeled *vehicles*. There is widespread *urban traffic* congestion, leading to continuing exceedance of air quality standards in many cities. Progress in developing and implementing regional and urban air quality plans has been slow. The effectiveness of EIA procedures should be further improved. The benefits of renewing the private vehicle fleet with less polluting vehicles have been offset by increased and high ownership (of four-wheeled and two-wheeled vehicles) and larger average engine size; the share of old vehicles remains high in the case of *trucks, buses and two-wheeled vehicles*. Taxes and charges are not fully in accordance with the polluter pays principle or the user pays principle; in particular, *exemptions* are granted to commercial and road freight transport. Many of the recommendations of

the 1994 OECD Environmental Performance Review remain valid. Further *co-ordination* is needed among national administrations, among administrative levels (state, regions, provinces and municipalities), and with neighbouring countries. Further *sharing of positive experiences* at local level, greater use of *demand side management* tools, reform of transport related *taxes and subsidies*, and effective application of *EIA and SEA* procedures are also necessary.

It is *recommended* to:

- improve co-ordination of economic and environmental *planning of transport* among the state, regions, provinces and municipalities, and among national administrations;
- further develop *market-based integration* through implementing a mix of supply and demand measures (concerning infrastructure, vehicles, fuels and traffic, transport market reform, taxes and charges);
- strengthen *exhaust emission controls* and vehicle inspection, particularly for trucks and two-wheeled vehicles;
- further develop and implement a long term strategy and medium term action plan to create *alternatives to road transport* in long distance freight movements and in urban mobility, and to ensure an appropriate focus on transport infrastructure development;
- review and revise *transport taxes and charges*, so as to better internalise environmental externalities and eliminate distortions among transport modes (e.g. progressively reducing exemptions and/or incentives to road freight transport);
- ensure the effectiveness of *environmental impact assessment* (e.g. public participation, large infrastructure projects) and further implement strategic environmental assessment, in line with EU legislation;
- further strengthen international co-operation to reduce the share of road transport in *cross-Alpine freight movements*, with a view to minimising negative environmental impacts.

3. International Co-operation

As a G7 member, a founder of the EU and a Mediterranean country, Italy has continued to support international environmental co-operation very actively, ratifying most agreements and enacting most EU directives, including for *climate change and air pollution* commitments. It is to be commended for its *low*

energy intensity, its clear GHG emission reduction *targets*, and its precise estimates of the environmental impacts of the national climate programme. In the 1990s Italy's performance in meeting international commitments to reduce *air emissions* was most satisfactory, with major reductions of SO_x and certain heavy metals as well as dioxins and furans. This progress will serve as encouragement in view of the further ambitious commitments being made (e.g. under the Gothenburg Protocol, to be ratified). With respect to *marine issues*, developments in the late 1990s have been positive for oil spill prevention, emergency response and ship safety, with quite significant equipment improvements, enforcement and commitments. Environmental co-operation with neighbouring countries has developed: Italy, France and Monaco have created a 100 000 km² *sanctuary* for protection of marine mammals, especially cetaceans, whose international status should be strengthened by UN recognition. Italy has also been very active in promoting international co-operation, particularly in the area of drought and *desertification*. It has ratified all relevant international conventions concerning nature protection and biodiversity.

Under a business as usual scenario, GHG emissions in 2010 would reach a level 13% above the Kyoto target. Italy would therefore have difficulty achieving its *Kyoto target* (i.e. reducing GHG emissions by 6.5% relative to 1990) without fully implementing its recent national GHG emissions reduction programme (set out in the national Kyoto Protocol ratification law passed in May 2002). According to recent projections, strongly reinforced policies and measures as well as improved monitoring and enforcement are needed, along with appropriate public and private sector involvement. Concerning protection of the Mediterranean from *land-based pollution*, most importantly from agriculture, industry and untreated municipal effluents, too little progress has been made and much remains to be done; monitoring and reporting on the state of the surrounding seas should be reinforced. There is concern about the effect of *overfishing* on some fish stocks, which translates into significant reductions in Italian catches and consequent difficulty adjusting Italian fishing capacities to new circumstances. Italy's *official development assistance* has fallen to a very modest 0.13% of GNP. This ODA level does not seem commensurate with Italy's international role or with the size of its economy. However, the Italian government, which is committed to the EU goal of 0.33% of GNP by 2006, has indicated its intention to further increase its ODA to 1.0% of GNP at a later date.

It is *recommended* to:

- increase the amount of *official development assistance* towards the Rio commitment of 0.7% of GNP;
- increase bilateral environmental ODA, as well as *environmental co-operation* with south-eastern European and other Mediterranean countries (e.g. Mediterranean Action Programme hotspots);
- implement, monitor and develop the national programme of *greenhouse gas emissions reductions* to meet the Kyoto target;
- continue effective implementation of the Montreal protocol and relevant EU regulations on *ozone depleting substances*; in particular, continue to enforce the ban on trade of CFCs;
- strengthen protection of the marine environment from *land-based pollution* (from agriculture, industry, traffic and municipal waste water);
- ratify and implement the few remaining recent *international environmental agreements* awaiting ratification (Annex II).

Part I

ENVIRONMENTAL MANAGEMENT

2

AIR MANAGEMENT*

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the Environmental Performance Review of Italy:

- take steps to reduce *ambient levels of particulate matter and ozone*, with emphasis on measures relating to transport;
- ensure implementation of existing legislation to measure and control *emissions of toxic air pollutants* from industrial sources, with a particular focus on those pollutants and sources that pose the greatest health risks;
- strengthen efforts to meet the targets of the Gothenburg protocols on reduction of emissions of *NO_x and VOCs*;
- complete and implement *regional air quality plans* to serve as primary evaluation and long-term planning tools; these plans should be explicitly and integrally linked to development of other regional and local plans (e.g. transport, energy, mobility);
- extend the use of *economic instruments*, such as emission trading schemes (especially for NO_x), and of *integrated pollution prevention and control* (e.g. plant-wide industrial permit limits);
- complete geographical coverage of the *air quality monitoring* network, extend monitoring of ozone and particulate matter, and improve quality assurance and control of monitoring techniques and data quality;
- accompany *liberalisation in the electricity and natural gas sectors* with strict implementation of energy savings objectives in these two sectors, as well as strict enforcement of the same air emission standards for new and existing power plants;
- promote further actions to develop the use of *renewable energy* in power plants.

* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental Performance Review of 1994. It also reviews progress with respect to the objective “maintaining the integrity of ecosystems” of the 2001 OECD Environmental Strategy. It takes into account the latest IEA Energy policy review of Italy.

Conclusions

Italy has made very *significant progress* in improving air quality over the last ten years. While data from the 1990s are far from complete, exceedances of air quality standards for most major pollutants (e.g. SO₂, NO₂, CO) have generally decreased. This progress reflects mainly: i) the great strides made in reducing *emissions from electric power generation*, with the use of cleaner power plants (fuelled by natural gas and, increasingly, by renewable energy resources) and highly efficient combined heat and power plants; and ii) the reduction of emissions of all common pollutants by *industry*, including SO_x, NO_x, CO₂, VOCs from solvents, dioxins and furans, and CO. Italy's progress also reflects significant, though insufficient, reductions in transport sector emissions of NO_x, CO, VOCs and lead, despite large increases in total vehicle-kilometres travelled. Italy has met most (but not all) of its international commitments regarding air pollution, including those for SO_x in the Helsinki and Oslo Protocols and for NO_x in the Sofia Protocol.

However, much remains to be done. Many areas (e.g. urban ones) continue to have poor air quality, particularly with respect to *ozone and fine particulate matter*. Italy's cultural heritage is suffering from the impacts of air pollution. With a strong percentage contribution of total air pollution, *transport* is the sector most in need of further efforts. Italian regions have, with notable exceptions, largely failed to develop air quality plans as required under the 1988 Presidential Decree. Despite significant expansion, the *air quality monitoring* network remains uneven across the country (with unsatisfactory situations, particularly in the South) and for some pollutants (e.g. PM₁₀). Concerning *toxics*, time series are being developed for emissions of some air pollutants such as benzene, dioxins and furans, heavy metals and PAHs; estimates for other air toxics are not available. Under the *Gothenburg Protocol* (to be ratified) and EU Directive 2000/81 on national emission ceilings (to be transposed by the end of 2002), Italy's primary challenge will be reaching the targets for NO_x and VOCs.

1. Evaluation of Performance

1.1 Air management policy objectives

Italy's main quantitative air management objectives are set out in *national legislation and regulations*, which transpose EU legislation. The 1966 Clean Air Act and subsequent regulations have set ambient air quality threshold values for SO_x, NO_x, PM₁₀, total suspended particulates (TSP) and ozone. A 1988 Presidential Decree transposed EU directives on air quality limit values for SO₂ and particulates (80/779) and for NO₂ (85/203). Legislative Decree 351/1999 transposed the 1996 directive on

ambient air quality, which includes ozone. Targets to curb air pollutant emissions were transposed from directives issued in 1970 (motor vehicles), 1984 (industrial plants) and 1988 (large combustion plants).

Air quality objectives associated with the *1988 National Energy Plan* include energy conservation, protection of the environment and public health, diversification of energy sources and suppliers, international competitiveness and stabilisation of CO₂ emissions. Efforts to regulate emissions from industry (e.g. through permitting, monitoring, inspections, enforcement) are related to the broader goals of devolution from the central government to regional and local authorities and addressing cross-media environmental concerns in an integrated fashion.

Many of Italy's air quality targets (including those for SO_x, NO_x and NMVOCs) derive from *international efforts* to control long-range transport of air pollutants (Table 9.3). Targets for CO₂ and other greenhouse gas emissions must comply with requirements under the Kyoto Protocol of the UN Framework Convention on Climate Change (UNFCCC), which Italy ratified in 2002 (Chapter 9, Section 1.1).

The *1994 OECD Environmental Performance Review* (EPR) recommended that Italy:

- ensure the completion of the air quality plans and emissions inventories provided for in the 1988 Presidential Decree, with appropriate public involvement in the former;
- implement effectively the 1988 Presidential Decree on air pollution from industrial plants and subsequent decrees, with expanded human resources, priority setting, and financing through appropriate fees;
- review efforts to assess and minimise the impact of air pollution on Italy's cultural heritage;
- review and implement strategies to achieve the emission targets concerning NO_x and VOCs and strengthen efforts concerning both the transport sector and stationary sources;
- approve and implement action plans to deal more rapidly with high-risk "Seveso" sites.

To integrate environmental and energy policies, the *1994 EPR* recommended that Italy:

- achieve further reductions in SO₂ and NO_x emissions from major installations, e.g. by speeding up the installation of desulphurisation and denitrification equipment;

- formulate and carry out an implementation programme for the control and stabilisation of CO₂ emissions to achieve the target set in the national plan;
- prepare a long term strategy to deal with NO_x emissions;
- further pursue energy efficient production and consumption patterns;
- further implement effectively its pollution abatement policy, monitor its results and integrate environmental concerns in the planned restructuring of the energy sector.

1.2 Air emissions and quality

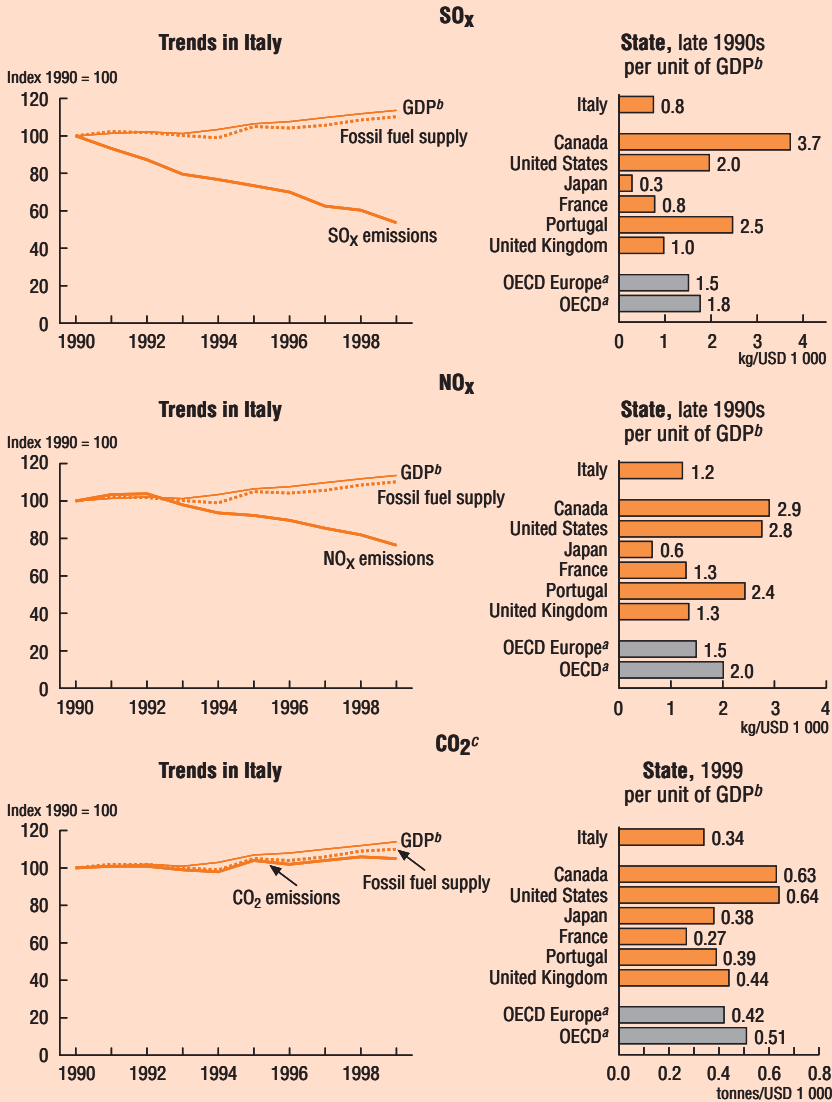
Traditional air pollutants

Overall, Italy has made great strides in reducing air pollutant emissions (Chapter 2, Section 2.1). In the 1990s SO_x emissions decreased by 46%, representing a further strong decoupling from GDP. In 2000 intensity of SO_x emissions per unit of GDP was well below the OECD Europe average, but higher than that of G7 countries such as Japan, France and Germany (Figure 2.1). In 2000, in regions for which data were available, no city with over 150 000 population reported exceedances of the attention level for SO₂. SO_x emissions have been dramatically reduced in nearly all sectors. Italy met its commitments under the Helsinki and Oslo Protocols (Table 9.3).

NO_x emissions increase in the 1980s were reversed in the 1990s. Intensity of NO_x emissions per unit of GDP is slightly below the OECD Europe average but well above the average in Japan or Germany. Italy did not meet its commitment under the Sofia Declaration (Table 9.3). In 2000 most cities for which data were available reported significant numbers of exceedances of the attention level for NO₂ (e.g. Padua and Cagliari had 179 and 161 exceedances, respectively). Future NO_x reduction efforts will need to target on-road emissions. Off-road transport emissions, particularly those in the maritime sector, increased throughout the 1990s; efforts should be made to reduce these emissions before they become a larger problem. Concerning SO_x and NO_x emissions from major installations, investment in advanced pollution control equipment (flue gas desulphurisation, denitrification and low-NO_x burners) has generally progressed. In 1990, Italy has set limits on SO_x and NO_x emissions for all (new and existing) installations, including power plants. The emerging trend is to re-power or shut down inefficient old power plants, in practice upgrading or replacing them with clean modern ones.

Efforts have been made to reduce NMVOC emissions, though Italy failed to meet its Geneva Protocol commitment (Table 9.3). Significant further efforts relating to NMVOCs should focus on the transport sector, with emphasis on petrol-fuelled

Figure 2.1 Air pollutant emissions



a) Secretariat estimates.

b) GDP at 1995 prices and purchasing power parities.

c) Emissions from energy use only; excludes international aviation and marine bunkers.

Source: UNFCCC; OECD; IEA.

passenger cars and motorbikes and on the industrial solvent sector. Potential hot spots, such as refineries in the South, should also be considered. Italy has signed but not yet ratified the 1999 Gothenburg Protocol on abatement of ozone, acidification and eutrophication by setting caps by 2010 for emissions of SO_x, NO_x, NMVOCs and ammonia (Table 9.3). It is well on track to meet the goal for SO_x emissions, but meeting the others will require significant additional efforts.

Ozone remains one of Italy's most pressing air quality and public health issues; ozone concentration standards are still exceeded in many areas. In 2000, the number of days on which the 8-hour ozone limit value (200 µg/m³) was exceeded was 55 in Rome, 26 in Milan, 16 in Palermo, six in Naples, five in Padua and four in Turin. The number of days of exceedances increased in most of these cities between 1999 and 2000; in Rome it more than doubled, from 24 to 55. In contrast, the number of days of exceedances of the 1-hour ozone standard (180 µg/m³) was reduced over this period, from 117 to 70 in Rome. Given inflows of NO_x from other countries, further progress in reducing ozone levels will be difficult. Owing to ozone's public health impacts (e.g. aggravated respiratory illness and lung inflammation), efforts to reduce NO_x and VOC emissions should be prioritised to meet ozone air quality standards.

The other greatest threat to Italy's air quality and public health remains *particulate matter* (PM). In 2000 the target quality value (annual average) for PM₁₀ was exceeded in many cities, including Brescia, Florence, Milan, Rome, Taranto, Turin and Venice. In Rome the three primary PM₁₀ monitors have indicated levels exceeding the target quality value during the past three years. In the winter of 2001-02, high PM₁₀ concentrations caused frequent interruptions of traffic (total interruptions or use of a system of even or odd plates) in northern Italy. Besides improving its PM monitoring network, Italy needs to take specific steps to reduce PM emissions from the transport sector (passenger cars, light and heavy commercial vehicles, buses, motorbikes): this should be given highest priority, as emerging data indicate serious health effects from PM including premature mortality. The EU's new indicative limit value of 20 µg/m³ for PM₁₀ will take effect in 2010. In 2002, a Ministerial Decree transposed EU air quality directive 99/30 and established a 24-hour standard for PM₁₀ as well as a monitoring network for fine particulate matter (PM_{2.5}).

Carbon monoxide emissions in excess of standards (150 µg/m³) have fallen significantly. Some cities, including Rome, continue to report unacceptably high numbers of exceedances. Additional efforts are needed, focusing above all on petrol-fuelled passenger cars, motorcycles (less than 50cc), motorbikes (more than 50cc), non-industrial combustion plants and maritime activities. CO emissions from each of these sources increased significantly in the 1990s.

Greenhouse gases

In the 1990s Italy's *carbon dioxide* emissions increased by 4.3% (Table 9.1). During the 1980s and 1990s the highest growth in CO₂ emissions by volume and percentage occurred in the transport sector (by 55%) and the energy transformation sector (by 24%). These increases were somewhat offset by a 13% decrease in CO₂ emissions from industry. The majority of Italy's CO₂ emissions continue to come from the energy transformation (34%) and transport (25%) sectors.

Methane emissions are still increasing but at a lower rate, due to reduced emissions from extraction and distribution of combustible fossil fuels. However, emissions from landfills continue to increase. This issue deserves particular attention, as the global warming potential of methane is 21 times that of CO₂.

Toxics

Italy recently signed but has not yet ratified the 1998 Aarhus Protocol on *heavy metals and persistent organic pollutants* (POPs) (Table 9.3). Significant progress has been made in reducing cadmium, lead and mercury emissions to below 1990 levels. Italy's ban on leaded petrol was in place by the end of 2001. The Aarhus Protocol also requires limiting batteries' mercury content. Exceptional progress was made during the 1990s in reducing air-borne dioxin and furan emissions from municipal waste and industrial combustion by imposing early and stringent standards. Future efforts should prioritise sintering plants and agricultural waste incineration.

Benzene emissions have been reduced. In 2000 annual concentrations in several cities fell but remained above the target value, including in Genoa, Florence, Naples and Trieste. The monitoring network needs to be expanded before general conclusions can be made. Italy should take measures to monitor and control other toxic air pollutants, particularly those arising from industrial sources, using a risk-based strategy to prioritise those toxics or sources that pose the greatest risk to public health. This could be achieved by gradually phasing in integrated pollution prevention and control (IPPC) permitting.

Air quality plans and monitoring

Four regions (Piedmont, the Veneto, Liguria and Basilicata) and the two autonomous provinces of Trento and Bolzano have approved *air quality plans* in line with the 1988 Presidential Decree. However, the 16 other regions are still without such a plan; four (Lombardy, Emilia – Romagna, Tuscany and Marche) have established co-operative plans with local governments to address air quality. In 1999 the Ministry of the Environment and Land Protection (MATT) appointed a working group to

define criteria and guidelines for the preparation of regional plans. Completion of these plans should be given high priority.

Italy has greatly expanded its *air quality monitoring network* for nearly all major pollutants since 1990. However, the network remains incomplete and inadequate, particularly for PM₁₀, ozone and benzene. Part of the monitoring equipment for PM₁₀ has to be replaced due to lack of EU conformity. Monitoring stations are primarily in urban areas, with uneven geographical distribution. The density of air quality monitoring stations exceeds minimum EU standards in the north-central regions, while in other parts of the country the number of monitors is inadequate. Regions, provinces and municipalities operate the air quality monitoring stations. For some pollutants, estimates of air pollution must be adjusted upwards since quality assurance and quality control of monitoring is not fully consistent with reference methods. Completion of Italy's air quality monitoring network should be given high priority.

Cultural heritage and air quality

The 1994 OECD Environmental Performance Review recommended minimising the impact of air pollution on *Italy's cultural heritage*. Some progress has been made in cleansing monuments suffering from the effects of past pollution. Rome carried out extensive projects in the period leading up to its Jubilee in 2000, restoring historic buildings damaged by years of air pollution. In 1997 the Ministry of Cultural and Natural Heritage (MBAC), with the support of the Restoration Central Institute, published a report on this subject. Measures such as petrol and diesel sulphur content standards were prepared for 11 major cities. A 2000 agreement between MBAC and MATT supports development of renewable energy, but there has been too little implementation to proactively address air pollution as it relates to this issue. A more dramatic step would be to adopt secondary or tertiary air quality standards in relevant regions to protect cultural resources (i.e. standards beyond those for public health and/or ecological protection, with related implementation measures).

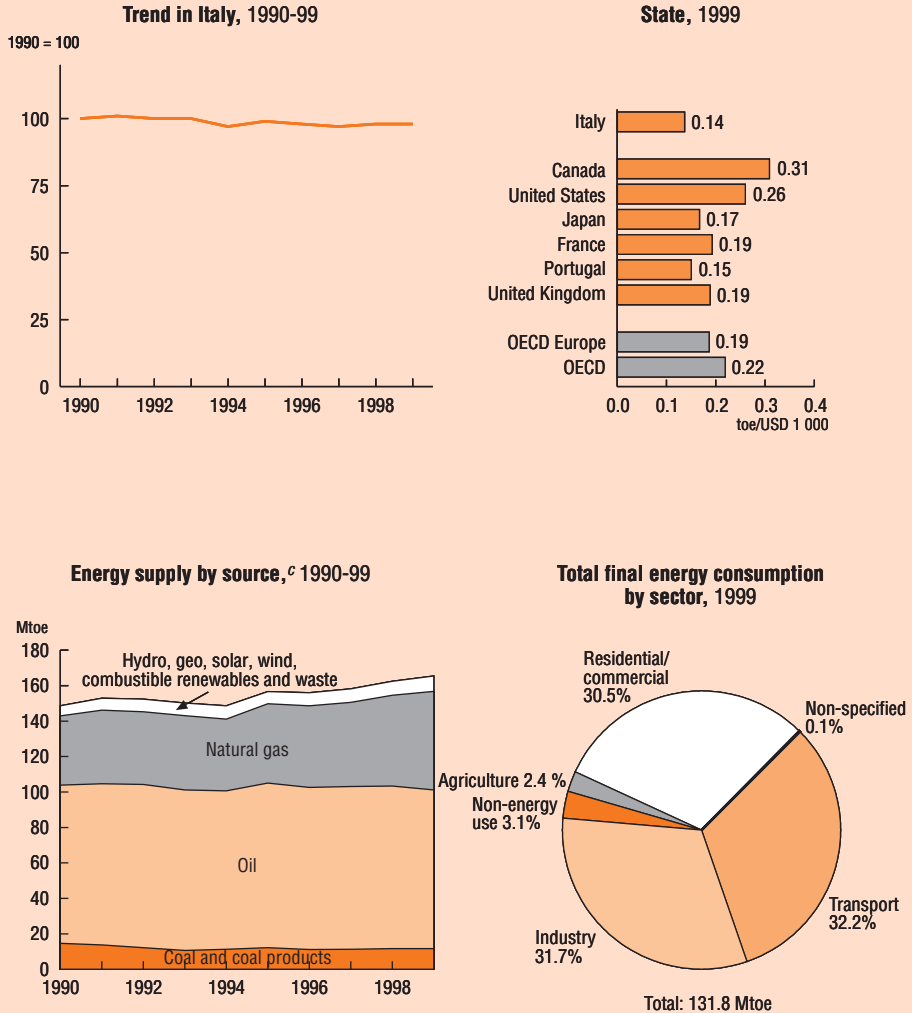
1.3 Energy

Energy sector trends

Italy has *one of the lowest levels of energy self-sufficiency* among OECD countries. The structure of its energy supply is as follows: 8.3% from solid fuels, 54.1% from oil, 33.6% from gas and 4.1% from renewables (Figure 2.2). Almost all its oil (95%) and natural gas (74%) is imported. In the electricity sector natural gas now supplies as much of Italy's needs as does oil. Overall use of natural gas increased by over 40% in the 1990s. Natural gas largely fuelled Italy's 22% growth in

Figure 2.2 Energy structure and intensity

Energy^a per unit of GDP^b



a) Total primary energy supply.
 b) GDP at 1995 prices and purchasing power parities.
 c) Excludes electricity trade.
 Source: OECD; IEA.

electricity demand during that decade (along with hydropower, to a much lesser degree). Italy does not rely on any nuclear power for domestic energy production. It imports 15% of its electricity from France and Switzerland. Use of renewables is growing very fast: in 1999 nearly 600 gigawatt-hours (GWh) of electricity was produced from biogas, over 400 GWh from wind and over 200 GWh from biomass, none of which accounted for over 2 GWh of electricity production from renewable energy in 1990. Geothermal electricity supply grew by 36%.

Italy continues to have *one of the lowest energy intensities* (i.e. supply per GDP) in the world, at less than half the OECD average (Figure 2.2). Low energy intensity is to some extent the result of energy efficiency efforts and relatively high energy prices (Table 2.1 and Chapter 6). It also reflects Italy's industrial structure (small industries with low energy intensity, imports of many goods whose production is energy intensive).

Table 2.1 Energy prices in selected OECD countries,^a 2000

	Electricity		Oil		Natural gas	
	Industry (USD/kWh)	Households (USD/kWh)	Industry (USD ^b /t)	Households (USD ^c /1 000 l)	Industry (USD/10 ² kcal)	Households (USD/10 ² kcal)
Italy	0.117	0.178	290.6	1 042.9	177.8 ^d	692.2 ^e
Canada	..	..	228.8	..	112.6	250.1
United States ^f	0.040	0.082	167.7	357.0	169.7	317.7
Japan	0.101 ^e	0.151	158.0	308.4	318.9	911.5
France	0.041 ^d	0.113 ^d	199.8	467.5	182.3	377.7
Portugal	0.113	0.201	372.7	..	..	..
United Kingdom	0.056	0.109	193.7	329.0	105.8	295.9
OECD Europe	0.064 ^d	0.129 ^d	233.8	500.1	158.2 ^d	442.9 ^e
OECD	0.057 ^d	0.107 ^d	261.1	448.5	135.3 ^d	363.3 ^e
Italian price/OECD Europe (%)	183	138	124	209	112	156
Italian price/OECD (%)	205	166	111	233	131	191

a) At current purchasing power parities.

b) High-sulphur oil.

c) Light fuel oil.

d) 1998 data.

e) 1999 data.

f) Electricity prices exclude tax.

Source: OECD; IEA.

Total final *energy consumption* in Italy grew by about 9% in the 1990s, compared with 12% in the 1980s. Consumption is split roughly equally between industry, transport, and commercial and residential use. Energy consumption by the transport sector continued to increase in the 1990s while industrial consumption remained flat. Energy intensity in the residential/commercial sectors is generally low and has remained flat since the early 1990s, but experience in other countries suggests it could improve further. In the 1990s oil demand changed little. Oil remained Italy's dominant energy source; overall oil refining capacity continued to decline in the 1990s, falling by 17%, and is now at nearly half of its 1977 peak.

Energy policy

Since 1994 Italy has made significant progress in adapting its energy policy to air quality management goals. It has greatly *increased the efficiency of electricity generation*. Most growth in demand is met by cleaner and more efficient natural gas power plants. Reliance on highly efficient combined heat and power plants increased from 8% of national electricity output in 1990 to about 20% in 1999. Renewable energy sources (except hydropower) still account for a very small share of total electrical output, though they are among Italy's fastest growing energy sectors. Initiatives have been taken to develop solar energy, such as the "10 000 Photovoltaic Roofs" programme (to be completed by 2003) and a 100 MW solar thermal demonstration plant (to be operational by 2005). A national biomass programme has been launched. A national fuel cell programme has resulted in a fully operational 1.3 MW fuel cell power plant in Milan, the largest plant of its type in Europe.

In the EU context *energy market liberalisation* has introduced competition into Italy's electricity and natural gas markets (Acts of 1999 and 2000, respectively), to be overseen by a new regulatory authority. Liberalisation may lead to further environmental progress by speeding up the renewal of power plants. Most new plants are expected to be of the combined cycle natural gas type, but use of less clean fossil fuels such as orimulsion is also expected to increase. Environmental benefits will only be realised if all new and existing power plants are subject to the same strict emission standards. Emission trading could facilitate this process. Liberalisation of the electricity and natural gas markets is likely to benefit consumers through overall price decreases; it will also introduce greater price volatility in these markets (Table 2.1). Italy is considering changing its electricity pricing system from increased block to volumetric pricing. The design of the current system serves two social goals: encouraging conservation and subsidising consumption by low-usage consumers. In the contemplated reforms, cross-subsidies would be eliminated and low-usage consumers would no longer have an incentive to keep electricity usage below threshold levels that trigger higher rates. This could lead to greater demand in summer months, for example, with exacerbation of ozone concerns.

Italy uses a range of environmentally related taxes (Table 6.2). The *carbon tax*, introduced in 1999, has been largely ineffective. Frozen for seven months in 1999-2000, it has not generated the revenue forecast nor been effective in reducing carbon emissions, partly due to implementation flaws related to exemption for the trucking industry, price volatility in the energy sector, and additional price uncertainty associated with the electricity pricing system. Italy applies separate charges to SO_x and NO_x emissions (Table 6.9), but at levels well below the cost of pollution abatement.

During the 1990s, Italy's CO₂ emissions increased by 4.3%. Little has been done thus far to reduce emissions of non-CO₂ gases, though Italian industry has pursued some initiatives. However, the government has presented its strategy to meet the Kyoto targets. The November 1998 Inter-Ministerial Committee for Economic Planning (CIPE) Guidelines for the Policies and the *National Measures for Reduction of Greenhouse Effect Gas Emissions* set out a national plan based on six types of actions. These are: i) further promotion of efficiency in the electricity sector; ii) reduction of energy consumption in the transport sector; iii) more energy production from renewable sources; iv) reduction of energy consumption in the residential, commercial and industrial sectors; v) reduction of emissions from non-energy sectors; and vi) promotion of carbon sequestration in forests. Quantitative goals for 2002, 2006, and 2008-12 have been established for each category (Chapter 9). If fully implemented, this national plan should produce important additional benefits with respect to reduction of traditional pollutant emissions, containment of energy imports and diversification of energy supply.

The CIPE plan requires that over 20% of carbon reductions to meet Italy's Kyoto targets be achieved by *increasing the efficiency of thermoelectric power plants*. To a great extent, this goal will be met through increased natural gas use in electricity production. An excellent example of such efforts is a voluntary agreement with the national electric power utility (ENEL) to convert 18 fuel oil-fired units (totalling about 16 000 MW) to natural gas combined cycle plants by 2006, increasing efficiency from 38% to 56%. These efforts also support the goal of diversifying fuel supply away from oil. However, they have not helped address Italy's low energy self-sufficiency as most of the natural gas used is imported.

While shifting to natural gas reflects a conscious effort to diversify fuel needs, further progress (in the EU context) should be achieved through increased use of *renewable energy resources*, which would account for nearly 20% of target greenhouse gas reductions under the CIPE plan. The share of renewables in total primary energy supply (TPES) in 1999 was 4.8%. The target set for Italy at the EU level is to increase electricity from renewables from 16% to 25% of electricity consumption by 2012. Energy market liberalisation has catalysed activities in this area. Starting

in 2002, larger electric power providers will be required to generate or purchase “green certificates” (corresponding to at least 2% of their supply) indicating they are using new sources of wind, biomass, mini-hydropower or geothermal power. The green certificates are currently intended to be valid for eight years. The stated goal is to double reliance on renewables by 2012, though other Italian and European efforts could increase the results eight-fold.

The government has taken broad steps to accelerate *energy efficiency* in the end-use sector, which is to provide 26% of greenhouse gas reductions under the CIPE plan. On 24 March 2001 the government issued implementation decrees specifying quantitative national objectives for energy savings by 2006, divided more or less equally between the electricity distribution and natural gas sectors. The decrees also establish general criteria for planning and implementing energy efficiency initiatives. Implementing efficiency provisions in building codes and incorporating labelling of energy consumption by household appliances (EU directive 92/75 and subsequent legislation) in the Italian legal system should be given priority.

1.4 Industry

In the 1990s Italian industry made *significant progress* towards improving air quality. Its emissions of SO_x, NO_x, CO, VOCs (from solvents), dioxins and furans decreased, and it was the only sector to reduce CO₂ emissions in that period. Analysis of industrial PM and (aggregate) toxic air pollutant emissions is not possible due to lack of data. Italy has made great progress in setting up the infrastructure to manage industrial air pollution. The 1999 Legislative Decree implementing the IPPC directive requires adoption of best available techniques (BATs) to reduce air pollution. It is expected to further improve the environmental performance of new and existing industrial plants; a timetable has been established for issuing permits to nearly 10 000 plants by October 2004.

Since 1990, Italy has regulated *industrial emissions of toxics* such as solvents and heavy metals. Some of these emissions come from large pollution sources such as oil refineries and power plants. Many others come from small and medium-sized enterprises that might not otherwise be subject to permitting or inspection under the IPPC directive. Given the very significant public health impacts of toxic air pollutants (e.g. cancer, birth defects), especially on local populations, higher priority should be given to developing the infrastructure needed to control those sources and emissions that pose the greatest risk to public health.

The 1994 Environmental Performance Review recommended that Italy approve and implement action plans to deal more rapidly with high-risk “*Seveso*” sites. Further to the 1997 Act regulating industries that have the greatest potential for high-risk

accidents, it transposed the Seveso II Directive in 1999. Between 1996 and 2000, 98 inspections were conducted at high-risk plants and approximately EUR 390 million was spent on prevention of major accidents. Oversight plans were implemented in two high-risk areas (Falconara and Milazzo) and are well under way in six others (Genoa, Livorno, Piombino, Porto Marghera, Ravenna and Savona). Oversight capacity (e.g. inspections, ability to intervene) remains incomplete, however, particularly in Campania and Lombardy where the number of Seveso sites has increased (Chapter 2, Section 2.2).

1.5 Transport

The *importance of emissions from the transport sector* largely reflects the number of cars in Italy (among the highest per capita in the world) many of which are over ten years old and have little or no pollution controls. Motorcycles and motorbikes (of which Italy has the highest number in Europe) also contribute to atmospheric emissions. Vehicle-kilometres travelled (largely by passenger cars) are increasing significantly (Chapter 8).

Transport policy has had *some success in reducing air pollution*, largely through the requirement that catalytic converters be introduced on cars in 1993. Nonetheless, the transport sector is by far the largest contributor of ozone-forming compounds (NO_x and NMVOCs) and particulate matter emissions. Since ozone and PM pollution are the greatest remaining concerns with respect to Italy's air quality, reduction of PM, NO_x and NMVOC emissions from mobile sources should be given the highest priority. Benzene emissions are a serious health concern (cancer-causing effects) and their emissions from two-wheel vehicles are very high. The CIPE plan anticipates that the transport sector will provide nearly 20% of required CO₂ emission reductions. In view of on-going increases in CO₂ emissions, Italy would require a much stronger effort to reduce energy use in the transport sector (Chapter 8).

Italy is generally making progress towards meeting EU *motor vehicle emission standards*. It has established a vehicle inspection programme that goes beyond minimum EU standards (e.g. for trucks). The government is also implementing several innovative voluntary efforts to reduce pollution emissions from vehicles. Some are unlikely to produce significant reductions (e.g. the "car-free Sundays" programme in certain cities) but may facilitate increased public awareness of air pollution sources. Other efforts have very specific goals, such as a voluntary agreement with Fiat to reduce its vehicles' CO₂ emissions. MATT is considering funding the purchase of natural gas-powered buses by local governments.

All levels of government in Italy give high priority to *transport planning*. While such planning considers pollution reduction, it is rarely integrated with the air quality

planning process in a meaningful way. Regional air quality plans developed by the Regional Environmental Protection Agencies (ARPAs) tend (in the few instances where they have been approved) to focus on industrial and other stationary source emissions. While Rome appears to be a notable exception, it is difficult to determine which of the many transport management measures are actually improving air quality. Efforts should be made to explicitly link broad and long-term air quality and transport planning processes.

2. Focus on Selected Topics

2.1 Trends in emissions of atmospheric pollutants

Following a 56% drop in nation-wide SO_x emissions during the 1980s, Italy further reduced these emissions by 46% in the 1990s. Reductions were driven by the attention given to emissions from stationary sources. In particular, power plants and industry reduced SO_x emissions by 44% and 56%, respectively. Power plants remain the largest source of SO_x emissions (60%).

While NO_x emissions in Italy increased by 24% during the 1980s, they fell by 24% in the 1990s. This change was primarily due to significant emission reductions in Italy's energy and transformation combustion sector (a 59% drop) and its on-road sector (a 24% drop by 1999 from the peak in 1992; a 41% drop for petrol-fuelled passenger cars). Following decreases in power sector emissions, mobile sources in 1999 accounted for over two-thirds of NO_x emissions (compared with just over one-half in 1980); petrol-fuelled cars remain the largest single sub-category with respect to NO_x emissions (20% of the total in 1999).

There was a general increase in non-methane VOC emissions in the late mid-1980s and early 1990s. NMVOC emissions decreased by about 20% between the 1992 peak and 1999. Emissions from on-road sources fell by 27% compared with 1992, and emissions from solvents by 27% compared with 1990. By 1999 the sub-category of motorbikes came close to being the largest single source of NMVOC emissions, producing barely less than petrol-fuelled cars. Motorbikes are the only sub-category among the top five contributors to NMVOC emissions in 1999 whose total emissions increased (by 68%) during the 1990s.

CO emissions peaked in 1992 and then fell by 22% in the period 1992-99. By 1999 mobile sources represented over 75% of CO emissions. The recent decrease is largely a function of a 41% drop in petrol-fuelled car emissions after 1992. There were significant increases in CO emissions from several other sub-categories during the 1990s, notably motorbikes (a 69% increase) and motorcycles (a 39% increase).

In 1999 these were the second and third largest sub-categories, respectively, with respect to CO emissions. Together they accounted for 15% of Italy's total.

Data on *PM emissions* are very incomplete and uncertain due to monitoring irregularities. Rough estimates from the mid-1990s indicate that the largest source of these emissions by far is the transport sector (44%). Energy combustion (17%), industrial combustion (14%) and open burning and fires (12%) are the other principal sources. In many Italian cities the contributions of light and heavy duty vehicles to PM emissions are roughly equal.

Methane emissions increased very slightly (by 3%) in the 1990s. In 1999 they totalled over 2 million tonnes, the equivalent of over 40 million tonnes of CO₂ emissions in terms of global warming potential. The main sources of methane emissions are waste treatment and disposal (emissions from which increased by 20% in the 1990s), agriculture (steady in the 1990s), and extraction and distribution of combustible fossil fuels (down 17% in the 1990s).

Emissions of benzene, lead, dioxins and furans decreased in the 1990s. Benzene emissions fell by about 53% in the period 1990-99. Most reductions were in the on-road sector, which represented nearly three-quarters of these emissions in 1999. Lead emissions fell by about two-thirds in the 1990s; most of these reductions took place in the on-road sector. Italy's ban on leaded petrol took effect on 31 December 2001. Vehicles constructed before 1983 were converted accordingly. Dioxin and furan emissions decreased by about one-half in the 1990s; emissions from waste treatment and disposal fell by 77%, accounting for only 29% of overall emissions in 1999 compared with 63% in 1990. Most reductions were in the municipal waste and industrial combustion sub-sectors, while emissions from agricultural waste incineration increased by 56%. By 1999 industrial combustion (38%) and agricultural waste incineration (16%) were the largest sources of these emissions.

In 1999 agriculture accounted for over 90% of *ammonia emissions* and over 60% of *N₂O emissions*. Emission levels for both these pollutants remained steady during the 1990s. Italy soon expects to have time series data for PAHs and certain heavy metals, but no estimates for other toxic air pollutants will be available.

2.2 Industry sector trends

In 1999 *industrial emissions* from non-power combustion and industrial processes accounted for 22%, 11% and 10% of Italy's SO_x, NO_x and CO emissions, respectively. SO_x emissions in the industry sector fell by 53% in the period 1990-99, with significant reductions in both sub-sectors. Industrial NO_x emissions were reduced by 35% during the same period, with nearly all these reductions occurring in

the non-power combustion sector. CO emissions in the industrial process sector were reduced by nearly one-half during this period, while industrial solvent emissions of NMVOCs decreased by 27% in the 1990s. CO₂ emissions from the non-energy industrial sector decreased by 13% in the period 1980-97.

Italy's three largest sectors in terms of *energy use* are industry, transport and residential/tertiary. Energy use in all three sectors increased during the 1990s, though industry's 3% growth rate was far less than those of the transport and residential/tertiary sectors (24% and 18%, respectively). Energy use by industry ranked highest in 1990, but was third (behind these other two sectors) in 1999.

In the 1990s the number of *high-risk* "Seveso" sites increased by 4% to 1 222. These industrial sites are located throughout Italy, but over 40% are in the Lombardy and Veneto regions. In regions where there were already a large number of Seveso sites, the greatest increases in the number were in the Campania (305%) and Lombardy (10%) regions.

3

WATER MANAGEMENT*

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the Environmental Performance Review of Italy:

- implement legislation according to the new EU Water Framework Directive and strengthen the role of *river basin authorities*;
- mobilise public and private investments to upgrade *urban waste water collection and treatment infrastructure*, in the context of the framework programme agreements between the State and the regions;
- speed up implementation of the Galli Act (e.g. application of *user and polluter pays principles*, consolidation of municipal water and waste water services within optimal management areas);
- implement statutory *water quality objectives* introduced by Legislative Decree 152/1999;
- implement demand management measures for *water resource conservation*, including stricter control of abstraction permits, and increase the use of treated waste water in irrigation;
- prepare *watershed management plans*, including both water quantity and water quality planning, in close consultation with the various stakeholders;
- strengthen prevention and mitigation measures concerning *flood management*; complete *hydrogeological risk plans* for all river basins;
- complete delineation of *areas vulnerable* to nitrate and pesticide pollution from agriculture.

* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental Performance Review of 1994. It also reviews progress with respect to the objective “maintaining the integrity of ecosystems” of the 2001 OECD Environmental Strategy.

Conclusions

Legal provisions were made in the 1994 Galli Act for meeting the key objective of sustainable financing of water infrastructure development. Water legislation was consolidated in a 1999 Legislative Decree transposing key EU directives (e.g. urban waste water treatment, nitrates). *Optimal management areas* (ATOs) are being created within which different municipalities' *water and waste water services* will be consolidated, thereby improving efficiency. Consolidation of water services has begun with the creation of integrated water agencies, often involving direct concessions to companies owned by local governments. A *river basin* approach is applied to *flood and soil erosion* management; basin authorities are being created, and hydro-geological basin-level plans are being prepared that delineate areas subject to flooding and landslides. In northern Italy, efforts have been made to conserve or replenish water resources, especially in the Po river basin. In southern Italy, innovative demand management measures have been implemented to discourage water use exceeding crop requirements, and collective water supply networks have been established to promote industrial development. Pollutant discharges by the chemical industry have decreased. Bathing water has remained of high microbiological quality.

However, if water reform principles have been adopted (e.g. the Galli Act), *only a start* has been made towards putting them into operation. There has been little progress in meeting the key objective of *acceptable quality of all water bodies* set for 2008, primarily due to very limited investment in urban waste water treatment infrastructure. Milan and several other major agglomerations still do not have sewage treatment plants. Inland water quality has deteriorated in major rivers and aquifers. Contamination by nitrates and pesticides remains of concern, though measures have recently been taken (delineation of vulnerable areas, introduction of a pesticide tax). Substantial *new funding* is required to cover the national deficit with respect to operating costs for water provision and waste water treatment, and to provide for much necessary investment. Specific provisions for such investments were included in the last financial law. Full cost recovery (of investment, operational and maintenance costs) would imply quite significant increases in water prices, which have remained very low by OECD standards. The public budget continues to subsidise collective irrigation schemes, including capital replacement. Low household water prices do not allow for necessary renewal of public water supply systems, and leakage is still high. There is a need to prepare economic analysis of how costs can be covered by tariff reform together with efficiency gains. *Intensity of water use* remains very high. There are still water shortages in the South, mainly resulting from both excessive ground-water abstraction for irrigation and high leakage in water networks. The right institutional framework is needed to address this problem; tradable water abstraction rights

could be introduced as appropriate. *Watershed management plans* have not been approved. Regions should seek co-operation with river basin authorities on both water quantity and water quality planning, in line with the requirements of the new EU Water Framework Directive, yet to be transposed.

1. Evaluation of Performance

1.1 Policy objectives

The draft 2001 Environmental Action Strategy for Sustainable Development, prepared by the Ministry of the Environment and Land Protection (MATT), defines three *key priority water management objectives*:

- *conservation or replenishment of water resources* to fulfil productive, environmental and recreational functions;
- *acceptable chemical quality* for all (surface and ground) water bodies by 2008 and good quality by 2016;
- *economic sustainability of water pricing* to finance infrastructure development, taking social conditions into account.

The Sustainable Development Strategy also sets these *operational objectives*:

- reducing leakage in water supply systems, *reducing water consumption* and re-using treated waste water, particularly in agriculture;
- *reducing the pollution load*, particularly through waste water infrastructure development, and developing separate systems for waste water and rain water;
- *implementation of full cost recovery*, particularly for sewerage and waste water treatment; moving towards more targeted social pricing of water; amortisation of investment over the long term; and ensuring that household water prices are independently regulated and that other types of water use are compatible with sectoral policy objectives.

To strengthen water management, the *1994 OECD Environmental Performance Review* (EPR) recommended that Italy:

- use water more efficiently by upgrading existing water distribution systems and implementing demand management measures (including increases in the prices of water resources and water services) for households as well as agricultural and industrial users;
- carry out the consolidation of water utilities;

- ensure that the action plan to meet the requirements of the EU directive on urban waste water establishes clear priorities and that measures are adequately funded;
- undertake urgently an increased investment effort in both drinking water supply and waste water treatment, on the basis of a new funding regime which will cover full capital and operating costs of providing water services;
- ensure the proper functioning of new and existing waste water treatment plants and promote better compliance with discharge permit conditions;
- make all river basin authorities fully operational as soon as possible, and give priority to the formulation and implementation of river basin plans as the main instrument for integrated water management (including the setting of ambient water quality standards to guide permitting authorities, and giving due weight to ecosystem management).

1.2 Objective of conservation or replenishment of water resources

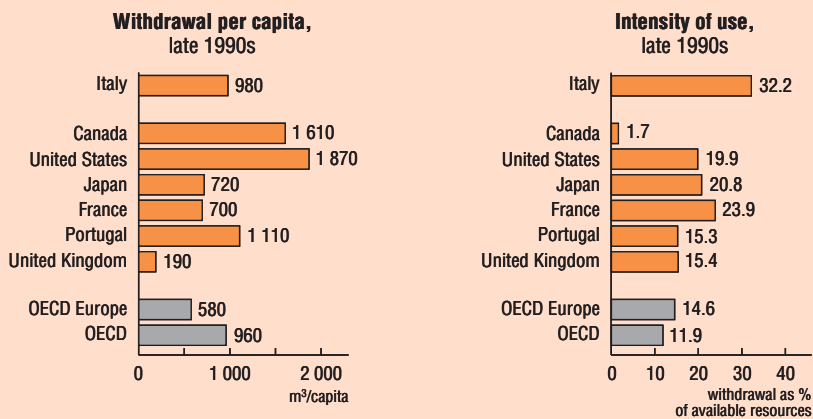
Caution must be used in interpreting data on *water use trends*. Monitoring of surface water abstraction by the regions is inadequate and is not carried out uniformly; thus it does not permit satisfactory evaluation of trends at the national level. The most recent national statistical survey concerning the public water supply was carried out in 1987. Industrial use is still estimated according to average consumption indexes calculated in the 1970s, which have not been updated. A survey on irrigation was recently initiated in southern Italy.

Water consumption by agriculture

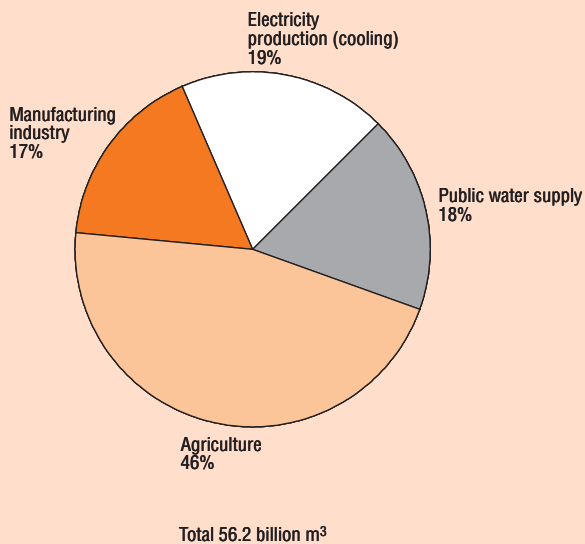
In northern Italy *some progress has been made* towards conserving or replenishing water resources. Use of irrigation water has decreased, particularly in the Po river basin. Discontinuation of high-consumption irrigation practices and diffusion of techniques based on lower water consumption (especially in the case of water-intensive crops like rice and corn) have contributed to this decrease. The total area under irrigation remained fairly stable during the 1990s. Irrigated crops still account for 40% of total agricultural value added.

Intensity of water use at the national level remains among the highest in the OECD area (Figure 3.1). There are *still water shortages in the South*, where locally abstracted groundwater is used intensively during the summer to supplement the supply from large water storage and transfer schemes operated by state-owned organisations and irrigation boards. Excessive groundwater abstraction for irrigation still occurs in the south of the Puglia region and in Sardinia. Following the declaration of

Figure 3.1 Water use



Freshwater abstractions by major use, 1998



Source: OECD.

a state of emergency by the government, the presidents of the southern regions were given exceptional powers to establish stricter water protection objectives. MATT is preparing a Ministerial Decree to develop re-use of treated urban waste water by farmers.

More efficient use of surface water depends on implementation of well targeted *demand management measures*, including economic incentives. Since the creation of reclamation boards run by farmers' associations in the 1930s, the public budget has continued to subsidise all the investment costs (including capital replacement) and a significant share of the operational costs of collective irrigation schemes. Abstraction charges for farmers, introduced in the Galli Act (36/1994), are far too low to serve as an incentive for behavioural change (Chapter 3, Section 2.1). As an example of demand management, farmers in the southern province of Capitanata (Puglia region) are allotted a (relatively low) standard volume of 2 050 m³ of water per hectare while a two-part charging system discourages water use above the indicated crop requirements. Water allotments may be cancelled if these requirements are consistently exceeded.

Before 1994, *public ownership of water resources* had to be explicitly declared by the public authority on a case-by-case basis. In practice, however, all surface waters of importance were considered to be publicly owned and were therefore subject to abstraction licensing. Use of groundwater was considered part of the landowner's rights. This dual regime ended with the Galli Act, which states that all water abstraction, including use of groundwater, must be licensed. Implementation of this provision has been slow, as tens of thousands of private abstractions must be identified and monitored. An appropriate institutional framework is needed for licensing of groundwater abstraction.

Almost 17 million people do not have adequate water supply during at least three months of the year. Most of them (80%) live in southern Italy (including Sicily and Sardinia). Where scarcity of public water supply makes abstraction necessary, abstraction licenses could be issued on condition that part of the water was allocated for irrigation and part for urban water supply. Irrigation boards could then transfer water for urban use at a negotiated price. *Tradable water abstraction rights* could be introduced in stress areas.

Water use by households and industry

Household water use has remained at about 200 litres per capita per day, placing Italy in the middle/high-range group among OECD countries. There is 90 to –100% metering of houses and apartment buildings, though fewer than 30% of households living in apartments have individual meters. Progressive pricing is an incentive to

lower consumption, but very low water prices limit the incentive effect (Chapter 3, Section 2.1). Low prices do not allow for the necessary renewal of public water supply systems. The average age of the pipe network is 35 years. Leakage is high, at around 30% (10% in aqueducts and an additional 20% in secondary distribution networks). Most sewerage (76%) is combined (i.e. waste water and storm water are not separated).

A substantial majority of *industrial users* abstract surface or groundwater directly and pay abstraction charges. In southern Italy collective water supply networks have been created to promote industrial development. The chemical industry (38% of total abstraction) is the largest industrial user, followed by the paper (14%), food (13%) and steel (11%) industries. Efforts have been made to introduce water-saving technologies in the paper industry. Water consumption per employee has increased in the food industry.

1.3 Objective of acceptable water quality

Recognising that many water bodies are not of acceptable quality (Table 3.1 and Chapter 3, Section 2.2), the government has established the key objective of achieving acceptable quality for all water bodies by 2008. All *EU water quality directives have been transposed*, though with delays. The directives on quality of surface water intended for drinking water abstraction (75/440) and on bathing water quality

Table 3.1 **Surface water quality in the main river basins, late 1990s^a**
(% of monitored sites in “poor” and “bad” quality classes)

Parameters	Po	Tiber	Adige	Arno	Brenta	Bacchiglione	Fratta-Gorzonze
Chemical quality (LIM) ^b	36	..	0	24	0	62	50
Biological quality (IBE) ^c	37	28	2	..	0	82	40
Ecological quality (SECA) ^d	49	..	0	..	0	82	63
Area of river basin (km ²)	68 700	17 156	12 000	8 228	3 000	3 000	..

a) 1999 for the Arno and Tiber basins; 1998 for the Adige basin; 1997-98 for the Po, Brenta, Bacchiglione and Fratta-Gorzonze basins.

b) Measured parameters: DO, BOD₅, COD, NH₄, NO₃, P_{total}, coliform bacteria.

c) Presence or absence of macroinvertebrate communities.

d) Combines LIM and IBE.

Source: ANPA.

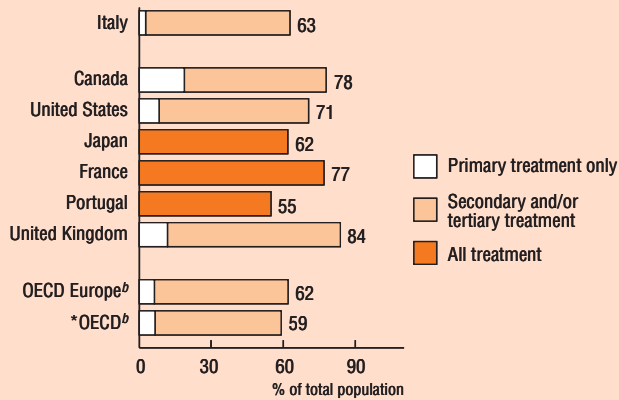
(76/160) were transposed in 1982. Those on pollution caused by dangerous substances discharged to water (76/464), groundwater quality and its protection from dangerous substances (80/68), and water quality for fish life (78/659) and shellfish life (79/923) were transposed in 1992. The directive on the quality of water intended for human consumption (80/778) was transposed in 1988 and the new drinking water directive (98/83) in 2001. The Legislative Decree on water pollution control (152/1999) transposed the directives on urban waste water treatment (91/271) and protection of water against pollution caused by nitrates from agricultural sources (91/676). It also introduced the concept of water quality objectives, including ecological objectives, thereby transposing part of the new water framework directive (2000/60). Classification of water bodies according to the new water quality objectives is expected by 2003.

Pollution from urban sources

The pollution load from urban sources was reduced during the 1990s, but not significantly. There was limited progress in developing *urban waste water treatment infrastructure* and separate sewerage for waste water and rain water in the 1990s. According to a 1998 survey, waste water treatment plants served 63% of the population compared with 61% in 1990 (Figure 3.2). There are currently 8 800 treatment plants; 819 new ones are being built and construction of 638 more is projected. Some existing plants (accounting for 13% of treated sewage) should be closed or upgraded, as waste water quality after treatment is well below standards.

Milan (metropolitan area population 2.7 million) still discharges effluents untreated to the Lambro-Olona river. In 2002 a case was brought before the European Court of Justice because untreated waste water was flowing to the Po delta and north-west Adriatic coastal areas, both designated as sensitive under the EU urban waste water treatment directive. Consequently, three waste water treatment plants with tertiary treatment are now being built. Completion is not scheduled before 2005. Under the urban waste water treatment directive, major cities were required to have full treatment facilities in operation by 1998.

Until recently, many cities have taken advantage of their proximity to the sea to *discharge urban sewage* directly to marine waters. Especially noticeable on the coasts of Emilia – Romagna and the northern Adriatic, such discharges have also taken place in the Gulf of Taranto and the Tyrrhenian Sea at the mouths of the Arno and Tiber. Under the Mediterranean Action Plan, some progress has been made in identifying priority pollution hot spots and sensitive Mediterranean areas (Chapter 9). Several major agglomerations (over 150 000 population) such as Catania (Sicily) and Taranto (Puglia) still do not have sewage treatment plants (Table 3.2). It is intended that all these agglomerations will be in conformity with the EU urban waste water treatment directive by 2004.

Figure 3.2 Population connected to public waste water treatment plant, late 1990s^a

a) Or latest available year.

b) Secretariat estimates.

Source: OECD.

Table 3.2 Waste water treatment, 1999
(% of population connected to public sewage treatment plant^b)

City ^a		City ^a	
Rome	78	Messina	40
Milan	0	Trieste	89
Naples	38	Taranto	7
Turin	96	Padua	27
Palermo	19	Brescia	80
Genoa	56	Reggio di Calabria	.
Bologna	99	Cagliari	100
Florence	12	Modena	85
Bari	46	Parma	69
Catania	3	Prato	89
Venice	52	Livorno	89
Verona	85		

a) Cities ranked by population size.

b) Taking into account days of operation and efficiency of treatment plant (COD out/COD in).

Source: Legambiente.

Industrial pollution

Italian legislation requires the regions to report on *industrial pollution* at the provincial level. Information to be submitted includes compliance with emission permits, but not data on pollution loads. Many derogations from EU directive 76/464 have been requested at mining sites where emissions of heavy metals in excess of standards are frequent, particularly in northern Italy (Val Padana). There has been a decrease in pollutant discharges (COD, nitrogen, phosphorus, suspended solids, heavy metals) by chemical plants participating in the industry's Responsible Care programme (representing 50% of total chemical output).

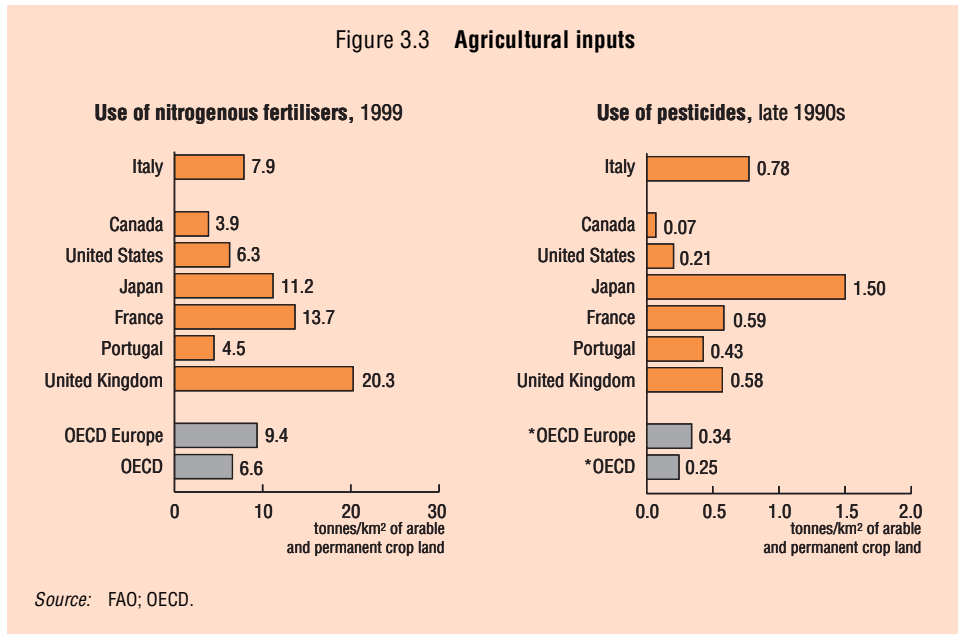
Agricultural pollution

At the national level, nitrogen surplus from *agriculture* (measured as soil surface nitrogen balance) fell from 44 kg/ha farmland in 1985-87 to 31 kg/ha in 1995-97, higher than the OECD average (23 kg/ha) but well below that of the EU (58 kg/ha). Nitrogen inputs originate from fertiliser use and (to a lesser extent) from manure. There is a nitrogen surplus of over 60 kg/ha farmland in northern Italy, particularly in Lombardy, Emilia – Romagna, the Veneto and western Piedmont. Fertile plains, including those of the Po valley, are increasingly affected by agricultural activity (large livestock farms). In the South, excessive fertiliser use in summer is one reason for the eutrophication of large reservoirs used for drinking supply. Nitrates and pesticides often contaminate aquifers. They are also increasingly overexploited in coastal areas, resulting in salt intrusion.

Under Italian law (DLg 152/1999) mandatory restrictions on agricultural practices apply where these practices contribute to water contamination by nitrates and pesticides. Under the EU *nitrate directive* a preliminary designation of vulnerable areas was completed in 1999, to be reviewed by 2003. Additional restrictions should cover use and storage of fertilisers and manure in these areas. In 1999 Italy issued a code of good agricultural practice, to be implemented on a voluntary basis throughout the country. It is intended to make this code compulsory in vulnerable areas through introducing cross-compliance with respect to agricultural support. The Po basin authority has proposed creating a manure bank, but the regions have not yet agreed to this proposal.

In 1986 widespread herbicide pollution was discovered in drinking water in large areas of northern and central Italy. This incident is known as the "atrazine emergency". Measures taken subsequently have included a ban on atrazine, re-registration of *pesticides* (PD 223/1988 and DLg 52/1997) and more stringent controls on pesticide sales (DLg 194/1995). During the 1990s farmers reduced their pesticide consumption by 13% (tonnes of active ingredients). This also reflects an increase in the total area that

Figure 3.3 Agricultural inputs



is organically farmed and that is subject to integrated pest management (Chapter 5). Pesticide use is still high by OECD standards (Figure 3.3). A 2% pesticide tax was introduced in 1999.

1.4 Objective of economic sustainability of water pricing

Legislation has been enacted to meet the main objective of economically sustainable water pricing, particularly with respect to financing water infrastructure development. The Galli Act provides for vertical and horizontal integration of water and waste water services to households and industry (abstraction, public water supply, sewerage, waste water treatment, discharge) within optimal management areas, to be delineated by the regions. In practice the water reform aims at efficiency and improved financing of water services, with appropriate attention to social and equity issues. Irrigation water management is not covered by the Galli Act.

Efficiency is to be achieved by administratively regrouping the population living within optimal management areas (not necessarily coinciding with river basins or their sub-units) (Chapter 3, Section 2.3). Associations of local authorities are to

organise water services on an integrated basis; this would previously have been the responsibility of some 8 000 individual municipalities. The Local Administration Reform Act (142/1990), now incorporated in DLg 267/2000, further specifies that a variety of institutional arrangements can be used to transfer this responsibility, including public-private partnerships (with a maximum 51% of shares held by municipalities and a minimum 20% by the state) and contracting out to the private sector (through public calls for tenders). Under the new system, prices will be set to cover the full long-term costs of services using a single charging method (combined bill). Such consolidation of water utilities should contribute to cost reductions through economies of scale.

All the regions except the two autonomous provinces of Trento and Bolzano have laws establishing *optimal management areas* (ATOs). Ninety-one ATOs have been delineated within river basins, typically following provincial borders (there are 94 provinces). The number of associated municipalities varies from one (ATO Milan) to 377 (ATO Sardinia). Populations covered vary from 52 000 to 4 million, averaging 700 000. Of the 91 planned ATOs, 59 have been formally constituted, though almost all have completed a survey of public water supply and waste water treatment infrastructure. All the planned ATOs in central Italy, two-thirds of those in the North and 50% of those in the South are operational. Seven regions do not have an operational ATO yet. The process of creating these new integrated water agencies has been slow; Italy has a long-standing tradition of direct municipal management. In 2001 a choice concerning how to manage the integrated water service was made in only 16 cases. All choices favoured direct concessions to a local company in which the majority of shares were owned by local governments. Only ATO 4 Lazio (Frosinone) chose to contract out. Nine ATOs (in the Tuscany, Veneto Umbria and Campania regions) have completed the process so far.

Since 1975 public water supply has been priced according to an increasing-block structure. The first blocks in each municipality are set at low prices. The very small fixed charge (meter rent) sometimes includes a free minimum allowance. Sewerage and sewage treatment charges are calculated at a constant volumetric rate (100% of invoiced water since 1996, 80% earlier). Under the Galli Act, and pursuant to 1996 Ministry of Infrastructure and Transport (MIT) guidelines, *water pricing should aim at full cost recovery while maintaining the tradition of social tariffs*. The new water pricing system establishes base tariffs that reflect average costs within the ATO. It also extends the increasing-block structure to sewerage and sewage treatment. Industrial and commercial users do not qualify for subsidised lower-block tariffs, but their base tariff is the same as that for households. The Galli Act prescribes higher rates for owners of second homes and seasonal tourism infrastructure (beach hotels).

Until the provisions of the Galli Act have been fully implemented in all ATOs, the Inter-Ministerial Committee for Economic Planning (CIPE) continues to determine water pricing rules, i.e. establishing parameters and limits (caps) every year and setting and adjusting prices for water (since 1974) and waste water (since 1995) services. It was decided that, as of 1997, waste water treatment charges and sewerage charges would each be set at a maximum of EUR 0.25/m³. In regions where these rates still apply, they are subject to annual adjustment by CIPE. The *Supervising Committee on the Use of Water Resources* (made up of four government and three regional officials) has been established to monitor price reform implementation and prepare a new method for setting prices. The new method will be submitted to MIT and MATT for approval.

In most of the country *substantial new funds are required* to cover the national deficit with respect to operating costs for water provision and waste water treatment, and to provide the significant new investment needed (investment levels have fallen in recent years). The amount of investment required to modernise water and waste water services in Italy has been estimated at around EUR 50 billion (i.e. EUR 2.1 billion/year over the next 23 years), of which 62% for sewerage and waste water treatment and 38% for public water supply. Full cost coverage would imply a significant increase in average water prices, up to a doubling at the peak of the investment period (after 15 years). The creation of ATOs, which are semi-independent price-setting bodies, should facilitate the transition to full cost recovery for water and waste water services. This is all the more necessary in that drinking water prices have remained very low by OECD standards and charges for sewerage and waste water treatment have traditionally been well below marginal cost. Since 1997 emergency public support (in the range of EUR 50 million/year) has been granted to areas with inadequate urban sewage treatment infrastructure. The financial law of 2001 established that ATOs must prepare, as part of their investment plans, a programme of urgent measures to implement the urban waste water treatment directive. Of the 91 planned ATOs, 80 have prepared and submitted their programme to MATT. To speed up investment, funds from the Community Support Framework 2000-06 can be made available to southern (priority I) regions, but only following designation of ATOs (first phase) and approval of the ATOs' investment plans (second phase).

MATT and other responsible ministries and agencies should *prepare an economic analysis* of how operating costs can be covered (with a minimum of delay) through reforming tariffs and reducing or eliminating exemptions, together with improvements in efficiency. This analysis should also consider how investment costs could be financed through an appropriate mix of funding from water charges, private capital, public budgets and international sources. It would be useful to implement such measures in the context of tax reductions and reduced public funding, particularly at the local level. The role of regulatory systems should be addressed, in

order to protect the interests of consumers and supply agencies and establish levels of investment appropriate for environmental protection. The experience of other countries should be considered, with a view to establishing a regulatory system appropriate to Italy.

2. Focus on Selected Topics

2.1 Water pricing

Household drinking water prices roughly doubled during the 1990s, but have remained very low by OECD standards (Table 3.3). Charges for sewerage and waste

Table 3.3 **Water prices in selected OECD countries,^a 1998**
(USD/m³)

		At current exchange rates	Corrected for PPP ^b
Italy	Rome	0.28	0.29
	Milan	0.13	0.13
	Naples	0.57	0.59
Canada	Ottawa	0.34	0.43
	Toronto	0.31	0.39
	Winnipeg	0.73	0.92
United States	New York	0.43	0.43
	Los Angeles	0.58	0.58
	Miami	0.36	0.36
Japan	Tokyo	0.92	0.74
	Osaka	0.68	0.54
	Sapporo	1.13	0.90
France	Paris (suburb)	1.46	1.28
	Bordeaux	1.16	1.02
	Lyon	1.45	1.27
Portugal	Lisbon	0.97	1.39
	Coimbra	0.72	1.04
	Porto	1.02	1.46
United Kingdom	London	0.62	0.57
	Bristol	0.57	0.52
	Manchester	0.55	0.51

a) Prices calculated for water supply to a family of four (two adults and two children) living in a house with garden rather than an apartment. Price based on annual consumption of 200 m³. VAT not included.

b) Purchasing power parities.

Source: IWSA.

water treatment have also remained very low, partly reflecting overall limited investment in infrastructure development. In 2001 the average price of household drinking water was EUR 0.80/m³, of which 58% was for public water supply and 42% for sewerage and waste water treatment. Prices vary greatly from one municipality to another (Table 3.4).

ATO Alto Valdarno (Arezzo-Tuscany region) was the first ATO in Italy to call for *private investment* tenders. A private investor chosen in 1999 (following intervention of the Regional Administrative Tribunal) now holds 46% of the water company's shares. During the first two years of operation, drinking water quality improved substantially (quality control is carried out by Siena University) and prices increased four-fold, contributing to the financing of an investment of EUR 143 million (30% for supply, 70% for treatment). It is estimated that it will take ten years to complete this investment and arrive at the final price structure. All but one of the ATOs in Tuscany have since engaged in similar public-private partnerships.

In 2000 *Rome* and 110 municipalities in its metropolitan area (around 3 million people) formed ATO 2 Lazio, served by Rome's municipal water and electricity utility (ACEA). In that year the municipality sold 49% of ACEA capital to private investors and ACEA was listed on the Milan stock exchange (ACEA, created

Table 3.4 **Water prices in selected municipalities, 2001^a**
(EUR/m³)

	Water supply					Sewerage	Waste water treatment
	Subsidised ^b	Basic ^c	1st block ^d	2nd block ^e	3rd block ^f		
Rome	0.11	0.36	0.58	1.18	2.30	0.09	0.27
Milan	0.17		0.27			0.11	0.27
Naples	0.37	0.65	0.75	1.01	1.20	0.09	0.26
Turin	0.14	0.35	0.46	0.82	1.19	0.09	0.22
Bolzano	0.10	0.24	0.26			0.13	0.41

a) VAT not included.

b) 0-100 m³ (Milan); 0-96 m³ (Bolzano); 0-92 m³ (Rome, Naples, Turin).

c) Not applicable (Milan); 97-144 m³ (Bolzano); 93-184 m³ (Rome, Naples, Turin).

d) > 100 m³ (Milan); > 144 m³ (Bolzano); 184-276 m³ (Rome, Naples, Turin).

e) Not applicable (Milan, Bolzano); 276-368 m³ (Rome, Naples, Turin).

f) Not applicable (Milan, Bolzano); > 368 m³ (Rome, Naples, Turin).

Source: Federgasacqua.

in 1909, has had almost an electricity and water supply monopoly in Rome since 1965). ACEA has progressively taken over waste water services from the municipality, a process that should be completed in 2002. International bids for a new 30-year concession should be solicited in 2008. Water was priced at EUR 0.93/m³ in 2001 (based on an annual consumption of 200 m³). Nearly 40% of this amount was for sewerage and sewage treatment. The new pricing system should be introduced by the end of 2002. Major increases in water pricing are not expected, as most of the necessary investment has already been made. Since 1994 Rome has invested EUR 450 million in doubling the size of its sewerage network, which now serves 92% of the population; 87% of the population is connected to treatment plants, which discharge treated effluent to the Tiber.

Abstraction charges for use of public water were introduced by the Galli Act (levels in 1993 were insignificant). It was originally intended that revenue would accrue to a water fund, but the amount is still too small to constitute such a fund. Charges are based on the licensed level rather than on actual abstractions. The rates established by the Galli Act vary according to type of water use. Farmers pay much less than other users: EUR 36/module (one module is equivalent to 100 litres per second) against EUR 1 550 for households and EUR 11 362 for industry in 2001. The rate for irrigation water delivered by canal, EUR 0.33/ha, is based on irrigated area rather than on water consumption. Charge concessions of 50% apply to industrial processes that entail water re-use or recycling, or water discharge without alteration. Similar concessions apply to irrigation if residual water is allowed to percolate to groundwater. ATO authorities or provinces must approve any request for price increases regarding aqueducts. The licensing authorities for water abstraction are the central government (primary network) and the regions (secondary network).

Waste water charges were set according to a formula defined in the Merli Act (319/1976). This formula took into account the quality of waste water discharges to public sewers (i.e. type of treatment). However, the introduction of these charges has often been delayed. In 1995, basic rates were introduced, at EUR 0.08 for sewerage and EUR 0.25 for waste water treatment. Since then CIPE has been responsible for annual adjustments of these rates. In 2001 CIPE aligned the rates for industry with those for households, as they had frequently become much lower. In ATOs where integrated water services are in operation, the “normalised method”, which provides for full cost recovery of investment and operational expenditure, must apply.

2.2 Water quality

Surface water quality scarcely improved during the 1990s. In 1996-98 one-quarter of the 478 *water bodies intended for drinking water abstraction* were in class A3 (strong physical and chemical treatment required) and 5% were in class SubA3 (values of parameters below the mandatory limits of directive 75/440). Action plans to improve quality have been drawn up for about one-half (66) of the water bodies classified as A3 or SubA3; most are located in Tuscany, the Veneto and Sardinia. Types of pollution correspond to the whole range of water quality issues (microbial contamination, nutrients, oxygen demand, persistent chemicals and heavy metals).

Until 1999 *river water quality* was designated as belonging to one of four quality classes. In 1997 39% of samples were in classes III (poor) and IV (bad) for faecal coliform, 83% for nitrates and 20% for phosphates. From 1999, new aggregate indices have been introduced to assess chemical quality (Broad Pollution Level or LIM), biological quality (Extended Biotic Index or IBE) and a combination of the two (Ecological State of Watercourses or SECA). Each of these three indexes includes five quality classes. By 2003 it is expected that all river basins will have been assessed (including for presence of micro-pollutants in water, sediment and biota). The assessment carried out in 1999-2000 (61% of Italy's 234 rivers) showed 33% of monitored rivers to be in classes IV (poor) and V (bad) for chemical quality (LIM), 13% for biological quality (IBE) and 37% for ecological quality (SECA). This situation is of concern in the Po river basin (particularly the Lambro-Seveso-Olona basin) and other smaller river basins (Table 3.1).

Among the great sub-Alpine *lakes* in northern Italy, Garda and Maggiore are classified as oligotrophic (satisfactory conditions) but Como and Iseo are still mesotrophic/eutrophic (unsatisfactory conditions). Nearly 63% of 500 rivers and 72 lakes conform to water quality standards for fish life (salmon and carp).

Coastal waters continue to be affected by effluents from the Tiber and Po river basins (Chapter 9). The lagoons of Orbetello, Venice and Comacchio are hypertrophic. Sediments in Venice's lagoon, the largest in Italy (550 km² with 600 million m³ of brackish water), are contaminated by dioxins and furans as well as lead and cadmium. These pollution levels led MATT to establish water quality objectives for the lagoon in 1998 and to set new discharge limits. A sewage treatment plant to serve Venice's Porto Marghera industrial area was commissioned in 2000. Two-thirds of 21 estuarine areas and 89% of 160 marine areas in Italy conform to water quality standards for shellfish gathering.

Bathing water quality continues to be high. In 2001, 96% of bathing beaches monitored complied with the mandatory values of directive 76/160 and 92% with the guideline values, which concern organic pollution. In freshwater zones these figures were 96% and 70%, respectively, with cases of non-compliance occurring in rivers rather than lakes. The dominant problem remains microbial. Coastal areas in which bathing was temporarily or permanently prohibited decreased from 526 to 401 kilometres between 1993 and 2001 (from 7.1 to 5.4% of the coastline). However, some 14.4% of coastal bathing areas continue to be without controls.

Groundwater is affected by urban sewerage leakage, waste dumping, nutrients from farming and saline intrusion (Puglia, Sicily, Tuscany). Here again, pollution is related to the whole range of water quality issues.

Groundwater is the source of nearly 85% of drinking water. *Drinking water quality* has improved for levels of heavy metals and nitrates, but has deteriorated for pesticides and bacteriological quality. Samples above maximum allowable content (under directive 80/778) show the following trends between 1993 and 1998: from 7.4% to 1.6% (iron); from 3% to 1.7% (manganese); from 1.2% to 0.6% (nitrate); from 0.2% to 1.4% (pesticides); from 4.3% to 7.5% (total coliform). Like other EU Member States, Italy has until the end of 2003 to ensure that drinking water complies with the standards set under the new drinking water directive, except in the case of levels of bromate and trihalomethanes (2008) and lead (2013). More stringent standards for trihalomethanes were introduced in Italy in 2001.

2.3 *Soil and water management planning*

When the Merli Act was issued, there was an intention to institute a system, similar to the French one, of river basin agencies that collect charges and set water quality objectives. Eventually a regional approach to water management planning was preferred. The Soil Conservation Act (183/1989) created *basin authorities*, distinct from administrative regions but without their own financial resources. Basin authorities have taken over from the regions the responsibility for preparing water management plans at watershed level for basins of national interest as well as for inter-regional basins (50% of Italy). Water management planning has remained the responsibility of the regions for the remaining 50% of the territory (regional basins). Draft watershed management plans have been prepared for only five of the 11 national basins, including those of the Arno, Po and Tiber. None of these plans has been approved yet. Such plans must be published for all basins within nine years of the adoption of the EU water framework directive (2000/60).

It was not until 1998 that river basin authorities began to be established, following the Sarno landslide in the Campania region that year. Act 267/1998 introduced *hydro-geological risk plans at the basin level* (PAI), with the view to delineating areas subject to flooding and landslides. A preliminary survey showed 3 671 municipalities (45% of all those in Italy) to be at high or very high hydro-geological risk. Pending completion of the PAIs (scheduled for the end of 2001), special plans were prepared to address the most urgent situations (i.e. those in which loss of human life was to be feared). By end 2001, only four PAIs had been completed (for the Basilicata, Calabria, Liguria and Po basins); 24 had been adopted at technical level, and the remaining 11 (out of a total of 39 basins) were in preparation. Restoration work is extremely costly: EUR 560 million was transferred from the central budget after the Sarno tragedy. Structural damage caused by flooding in the Po basin in 2002 was estimated at EUR 5.7 billion. The amount of state compensation should be limited in the event of natural disasters if settlement had occurred in an area known to be at risk from seismic or hydro-geological factors.

Under the Galli Act, the regions were asked to establish programmes to reduce water consumption. Under the Legislative Decree on water pollution control (152/1999) they began to prepare water protection plans defining quality targets, acceptable pollution loads and discharge limits for each water body (the deadline is 2003). For both quantity and quality planning, *regions should seek co-operation with river basin authorities*. To simplify procedures and facilitate integrated water resource management, the Parliament is considering regrouping the Soil Conservation Act, the Galli Act and the Legislative Decree on water pollution control into a single Act.

4

WASTE MANAGEMENT*

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the Environmental Performance Review of Italy:

- accelerate the adoption of *regional waste management plans*, including closing down small and unsatisfactory landfills and replacing them with disposal facilities that meet current technical norms and regulatory requirements;
- pursue efforts to increase *separate collection* of urban waste, including packaging materials, and adopt economic and regulatory measures to further develop the *recycling markets and industry*;
- develop the use of economic instruments and voluntary agreements aimed at reducing *waste generation*;
- improve the capacity and quality of *hazardous waste* disposal facilities and their national coverage;
- further improve *waste accounting and monitoring*, with special reference to generation and disposal of special and hazardous wastes;
- implement remediation measures in *contaminated sites* of national importance and speed up completion of regional inventories of contaminated sites.

* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental Performance Review of 1994. It also reviews progress with respect to the objective “maintaining the integrity of ecosystems” of the 2001 OECD Environmental Strategy.

Conclusions

With the 1997 Ronchi Decree, Italy transposed the EU directives on waste, hazardous waste and packaging waste. A number of specific objectives were adopted regarding *recovery of waste materials* and restriction of landfilling to pre-treated waste only; a waste accounting system was developed at national level. The regions were given responsibility for defining waste management plans to integrate waste collection, treatment and disposal in optimal management areas (ATOs), so as to overcome inefficiencies due to over-fragmentation of waste services. Separate *collection of "urban waste"* and material recovery increased steadily over the decade; in 1999 it almost reached the 15% target set by the Ronchi Decree. Data on "*special waste*" also show increased material and energy recovery, coupled with a decrease in landfill disposal. A private "consortium" was established to co-ordinate and stimulate the recovery and *recycling of different packaging materials*, with positive results (recycling costs are lower than in many other OECD countries). Significant increases have been recorded in the production of high quality compost from separately collected organic material. *Pricing* of urban waste collection and disposal services (intended to fully cover operating and investment costs on the basis of generated quantities) is being experimented with in a number of municipalities. Economic instruments are being used in the form of product charges levied on producers and importers of virgin materials, to assist in recovering packaging materials, waste oil and used batteries. Voluntary agreements have been launched (e.g. collection and recovery of single-use cameras, "computerised trading of waste" project). A national *inventory of contaminated sites* has been established and priorities have been identified.

While waste management reform has been adopted and its *implementation has begun*, much remains to be accomplished. Despite the stated primary objective of source reduction, per capita *generation of urban waste* has grown continuously since the early 1990s, reaching the OECD average of about 500 kg per capita in 2000. The volume of materials recovered through *separate collection* is still low, largely due to poor results in the central and southern regions; further efforts will be necessary to increase recycling of packaging materials. Large amounts of waste continue to be *landfilled* in small standard facilities without pre-treatment. Uneven distribution of suitable treatment and disposal facilities is an obstacle to ensuring proper management of hazardous waste without transporting it over long distances. *Hazardous waste exports* were ten times greater in 1999 than in 1993, reaching 6% of total generation. Despite the reorganisation of the Waste Register in 1998, improvements are needed in *waste accounting and monitoring*, particularly with respect to generation, treatment and disposal of special waste. Many regions have not yet prepared a

plan for organising integrated *municipal waste management networks within ATOs*. Use of *economic incentives* and other instruments, such as voluntary agreements, to promote waste minimisation and encourage recycling need to be further developed.

1. Evaluation of Performance

1.1 Development of legislation and waste management objectives

The *Ronchi Decree* (DLg 22/1997) was adopted to address gaps in Italian legislation concerning waste management, and to adjust the Italian system to European norms and regulations with respect to waste, hazardous waste and packaging materials. It is supported by a number of implementing decrees that regulate the handling of specific waste flows. The Ronchi Decree reaffirms that priority should be given to prevention of waste generation and recovery of waste material rather than to disposal, which should be the last option considered.

Special emphasis is placed on separation of waste materials at their origin. Specific targets have been fixed for *separate collection* of urban waste: 15% by March 1999, 25% by March 2001 and 35% by March 2003.

The Ronchi Decree also stipulated that as of January 2000 only *inert or previously treated waste* was to be sent to landfills. This deadline has been postponed awaiting transposition of the EU directive on landfills (99/31). A tax on waste disposal in landfills was previously instituted as an economic disincentive.

The Ronchi Decree envisaged the creation of *optimal management areas (ATOs)* to overcome inefficiency due to overfragmentation in municipal waste management. The regions have been given the task of drawing up regional plans to improve waste management, including waste collection, treatment, recovery and final disposal.

The Ministry of the Environment and Land Protection (MATT) issued national regulations on the *clean-up of contaminated sites* in December 1999 (Chapter 4, Section 2.1).

The *1994 OECD Environmental Performance Review (EPR)* recommended that Italy:

- take determined action to increase the share of up-to-date treatment capacity for municipal waste, and install additional treatment capacity for industrial and particularly hazardous waste to overcome the present shortage in this area;
- consolidate the current legislation and regulations and make them easier to understand and enforce;

- implement procedures and legislation for the recovery and recycling of both municipal and industrial waste;
- extend the use of economic instruments and of the polluter pays principle in support of municipal waste management activities (e.g. local funding);
- ensure that regions and local authorities update their waste management plans, and move towards a pooling of waste treatment facilities among several communities in order to improve the quality of plant design and operation;
- take further measures to avoid local resistance against the siting of new waste management facilities: requiring public involvement at an early stage of the planning process and appropriate public information from all levels of government and industry on their waste management performance;
- complete and implement the regional plans for the reclamation of contaminated sites.

1.2 Urban and special waste: generation and disposal

Since 1997, with the transposition of relevant EU directives into Italian legislation, waste materials have been classified in two categories according to their origin: “urban waste” and “special waste”. For special waste, a distinction is made between hazardous and non-hazardous. A *waste accounting system* based on a compulsory waste declaration (MUD) to be submitted to local Chambers of Commerce was instituted in 1994. In 1998 the Italian Waste Inventory was attached to the National Environmental Protection Agency (ANPA) to overcome uncertainties associated with data previously collected. The Ronchi Decree introduced the European waste catalogue, for which precise comparisons between current data and those acquired before 1997 are difficult.

Generation of urban waste increased over the last decade (Table 4.1 and Figure 4.1), reaching 29 million tonnes in 2000 (i.e. 503 kg/person/year). While urban waste generation per capita is now comparable to the European average, there are large differences within Italy (452 kg in the South, 500 kg in the North, 547 kg in the centre in 1999) (Chapter 4, Section 2.2).

Special waste generated in Italy has been increasing, amounting to some 68 million tonnes in 1998 including 4.1 million tonnes (8.5%) of hazardous waste and some 20 million tonnes of inert material (especially construction and demolition waste). Inert material is estimated at about 20 million tonnes per year, but there are no measured data since this category is not subject to obligatory declaration. Annual generation of special waste (not including inert waste) is 65% in the North, 15% in the South and 20% in the centre. Nonetheless, there is some uncertainty regarding data on special waste generation since the ANPA accounting system is not yet fully operational.

Landfilling is still the main type of urban waste disposal, though there has been an increase in the rate of recovery. In 1999 landfilling accounted for nearly 75% of all urban waste to be treated, while 11% was sent to recycling (8%) and composting (3%) facilities, 7% was incinerated and another 7% was disposed of in other ways (Table 4.2). During the period 1994-99 available data show a slight downward trend in volumes of urban waste sent to landfill. Especially in the South, many small landfills offer low disposal costs (EUR 30/tonne). Landfills often do not meet current technical requirements. Incineration capacity is mostly concentrated in northern and the central Italy.

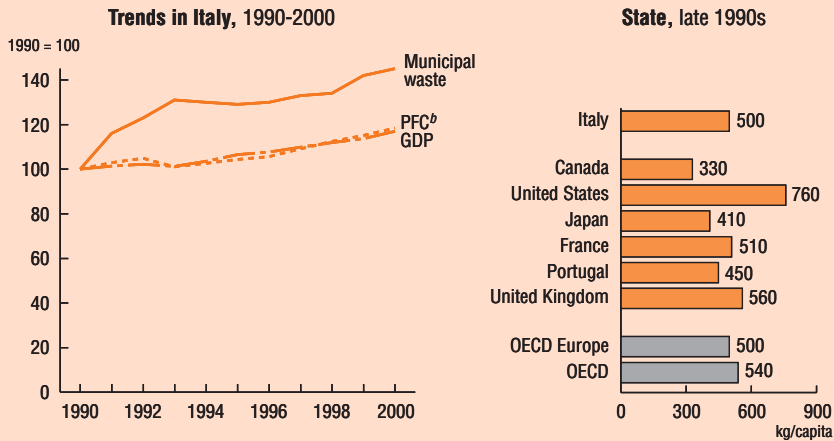
Available data do not establish a clear relationship between *treatment of special waste* and the quantities generated. The main reasons for uncertainty appear to be related to definitions of some storage and recovery operations, as well as illegal dumping. A total of 56.4 million tonnes of special waste was treated in 1998. Landfilling has slightly decreased (from 45% in 1997 to 40% in 1998), but material and energy recovery (36%) as well as biological treatment and spreading of sewage sludge on farmland (6%), have increased significantly since 1997 (by 26% and 2%, respectively). Incineration with or without energy recovery accounted for only 1.5% of special waste treatment in 1998.

Many regions do not have suitable treatment facilities for *hazardous waste disposal*, necessitating transport of this waste over long distances. Together with incineration, physico-chemical and biological treatment were used for over 50% of the 4.1 million tonnes of hazardous waste generated in 1998. Some 30% of this waste were directed to recovery operations and the rest was landfilled.

1.3 Urban waste: separate collection and recycling

Separate collection of urban waste improved between 1996 and 1999. The volume of urban waste collected separately for recycling increased significantly (from 7% to 13% of total urban waste generation) due to measures promoting waste recovery (Table 4.3). This is slightly below the Ronchi Decree objective of 15% by March 1999. With respect to the three main components of recycled materials (glass, paper and plastic) separate collection and recovery levels in Italy are still relatively low (Figures 4.2 and 4.3). Collection levels vary greatly among regions. In the North separate collection reached 23% in 1999 (above the 15% objective). It was 9% in the centre and only 2% in the South.

In 2000 some 11 million tonnes of *packaging materials* entered the market, of which 40% was recovered (Tables 4.4 and 4.5), an increase of 8% compared with 1997. The Ronchi Decree established the National Packaging Material Consortium

Figure 4.1 Municipal waste generation^a

a) In interpreting national figures, it should be borne in mind that survey methods and definitions of municipal waste may vary from one country to another. According to the definition used by the OECD, municipal waste includes waste originating from households, commercial activities, office buildings, institutions and small businesses that dispose waste at the same facilities used for municipally collected waste.

b) Private final consumption.

Source: OECD.

Table 4.1 Generation of urban waste, 1991-2000

	1991	1995	1997	1998	1999	2000 ^a
Total Italy (10 ⁶ t)	20.0	25.8	26.6	26.8	28.4	29
of which:						
North	.	.	.	12.2	12.8	.
Centre	.	.	.	5.8	6.1	.
South	.	.	.	8.8	9.5	.
Kg/capita/year						
Italy	350	450	462	466	492	503
North	.	.	.	478	500	.
Centre	.	.	.	527	547	.
South	.	.	.	419	452	.

a) Based on survey of 50% of the national population.

Source: ANPA.

(CONAI) to co-ordinate the activities of six consortia in the recovery of aluminium, glass, paper, plastic, steel and wood. To enhance separate collection of these waste streams by municipalities, CONAI signed an agreement with the National Association of Italian Municipalities (ANCI). While the number of municipalities taking part in this scheme is rapidly increasing, further progress will be required to reach the goals fixed by the EU packaging directive. Recovery of packaging waste varies according to the types of materials being collected. There was a considerable increase in collection of paper (+109%) and plastic (+132%) between 1996 and 1999.

Table 4.2 **Disposal of urban waste, 1994-99**
(% of total urban waste disposal)

	1994	1996	1997	1999
Landfilling	88.0	83.0	79.9	74.4
Incineration	5.0	6.0	6.6	7.2
Recovery	7.0	5.0	9.4	11.0
Other method	–	6.0	4.1	7.4

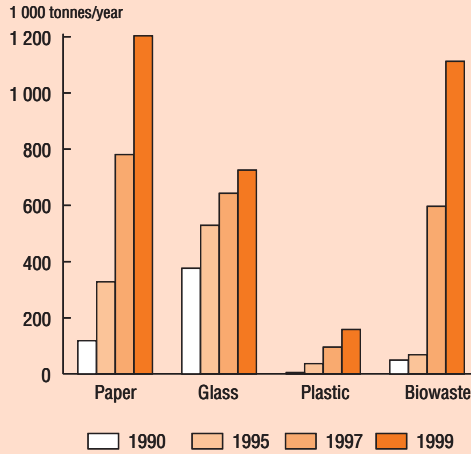
Source: ANPA.

Table 4.3 **Separate collection of urban waste, 1996-99**
(% of total urban waste generation)

	1996	1997	1998	1999
Total Italy	7.2	9.4	11.2	13.1
North	12.7	17.0	19.7	23.1
Centre	5.6	6.4	7.8	9.0
South	1.1	1.4	1.6	2.0

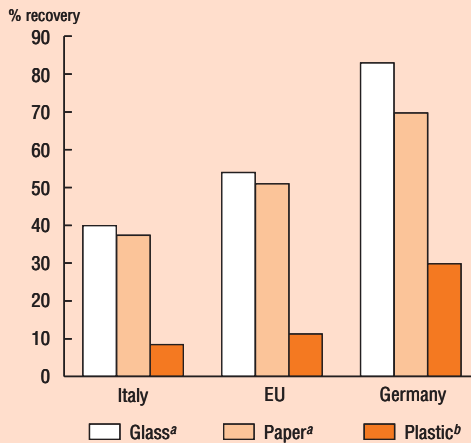
Source: ANPA.

Figure 4.2 Trends in separate waste collection, 1990-99



Source: Legambiente.

Figure 4.3 Recovery levels of some materials, late 1990s



a) EU average excludes Luxembourg. Data refer to amount collected/apparent consumption.

b) EU average refers to recycled waste + waste exported to be recycled/collectable waste.

Source: CEPI; FEVE; APME; OECD.

Total installed composting capacity is about 2.2 million tonnes at 137 installations, located mostly in the North. In 1999 about 1.4 million tonnes of good quality compost was produced from *biodegradable waste* collected separately. In addition, 41 mechanical waste sorting plants treated 2.2 million tonnes of mixed waste to produce compost of poorer quality. It has been difficult to find a market for this compost, which is sometimes used as landfill cover.

Table 4.4 **Recovery of packaging waste, 2000**

Material	Packaging consumption	Material recovery		Energy recovery		Total recovery		Population covered ^a
	(10 ³ t)	(10 ³ t)	(%)	(10 ³ t)	(%)	(10 ³ t)	(%)	(%)
Glass	2 305	920	40	..	..	920	40	18
Paper	3 936	1 823	46	150	4	1 973	50	52
Plastic	1 900	305	16	221	12	526	28	71
Metal	658	168	26	3	..	171	26	45
Wood	2 452	868	35	..	..	868	35	..
Total	11 251	4 084	36	374	3	4 458	40	..

a) March 2001.
Source: CONAI.

Table 4.5 **Separate waste collection, 1996-99**

(1 000 tonnes)

	Paper	Glass	Biodegradable waste	Plastic	Aluminium
1996	576	550	376	69	3
1997	782	644	598	97	6
1998	1 001	666	891	151	10
1999	1 204	726	1 113	160	14

Source: ANPA.

1.4 *Special waste: prevention and recovery*

In 1998 some 20 million tonnes of special waste underwent *material and energy recovery* and 3.4 million tonnes of biodegradable waste was turned into compost or spread on farmland (sewage sludge). The largest volumes of special waste recovered consist of inert material from construction and demolition, light ash from thermal treatment, stone cutting and wood processing waste, and calcium carbonate.

Two specialised consortia collect and recover *used oil and lead batteries*. In 2000, 183 000 tonnes of used oil was recovered, representing 30% of total consumption. Recovery accounted for some 90% of the oil collected. In the same year 177 000 tonnes of lead batteries was collected (95% of all used batteries); some 95 000 tonnes of secondary lead was produced and about 34 000 tonnes of sulphuric acid was neutralised.

Measures to *prevent and reduce* waste generation have been taken following issuance of the Ronchi Decree, particularly in the packaging sector. Producers of packaging materials have made efforts to reduce the weight of packaging, avoid over packaging and limit the use of non recoverable materials and chemicals. They better inform consumers on whether packaging materials can be re-used or easily recycled. The re-use of packaging materials has been increased in the transport sector. According to the Ronchi Decree, regions should impose quotas of recyclable materials in public procurement. However, initiatives at the local level (regions, provinces, municipalities) have been often limited to awareness campaigns and dissemination of relevant information to households and industry. Use of voluntary agreements has recently developed, e.g. for single-use cameras, whose collection and recovery are subject to an agreement signed in July 2000. Discussions related to other products, especially durable goods, are under way. Through an agreement signed by enterprises in January 2002, a “computerised trading of waste” scheme mutually informs contracting firms about possibilities to recover, dispose of, treat or transport their waste.

Sludge from waste water treatment plants is spread on farmland. Available data are inadequate; an information network is being established.

1.5 *Use of economic instruments*

In an effort to introduce sustainable development principles in waste management, the Ronchi Decree provides the basis for introducing a new charging system. The new system should be applied over an eight-year period (2000-08), gradually replacing the present *user charge for municipal waste collection and disposal* (TARSU). There is a fixed component based on operational and maintenance costs, and a variable component based on the quantity of waste sent to disposal by each citizen, while the TARSU

has been calculated according to each dwelling's surface area. Current cost recovery under TARSU ranges from 60% in Sicily to 91% in Emilia – Romagna. It averages 79% for the whole country. In 2000 some 200 municipalities, representing about 3% of Italy's population, applied the new system on an experimental basis. Most of these municipalities were located in the North (over half were in the Bolzano province of Trentino – Alto Adige).

A *landfill tax* was introduced in 1995 as an incentive to reduce waste at source, promote separate collection and recycling, and discourage disposal to landfill. This tax is based on the quantity and type of waste being landfilled. It is also applied to waste incinerated without energy recovery and to waste from mechanical waste sorting plants. The owner of the disposal facility pays the tax; the revenue goes to the regions (90%) and provinces (10%). The landfill tax will be abolished for urban waste once the new charging system is fully in place.

Other economic instruments used in waste management are the *contributions paid by producers, importers and users* of packaging material to CONAI to help cover the cost of managing collection and recovery of this material. Producers and importers of lead batteries and mineral oil also pay contributions to the specialised consortia in charge of their recovery.

The organisation of *integrated waste management systems* within ATOs is progressing very slowly. Many regions and provinces have not yet defined a suitable plan. One exception is the autonomous region of Friuli – Venezia Giulia. Its regional plan, officially adopted in February 2001, reviews the amounts and composition of urban waste generated throughout the entire region as well as existing disposal facilities. Based on current levels of separate collection and recovery, the plan defines needs for further treatment plants so that each province in the region can be self-sufficient and only residues of pre-treated waste are sent to landfill. This plan provides updated technical norms and guidelines for construction and management of secure landfills and high quality composting plants. Approval procedures are centralised at the provincial level.

1.6 Transfrontier movements of waste

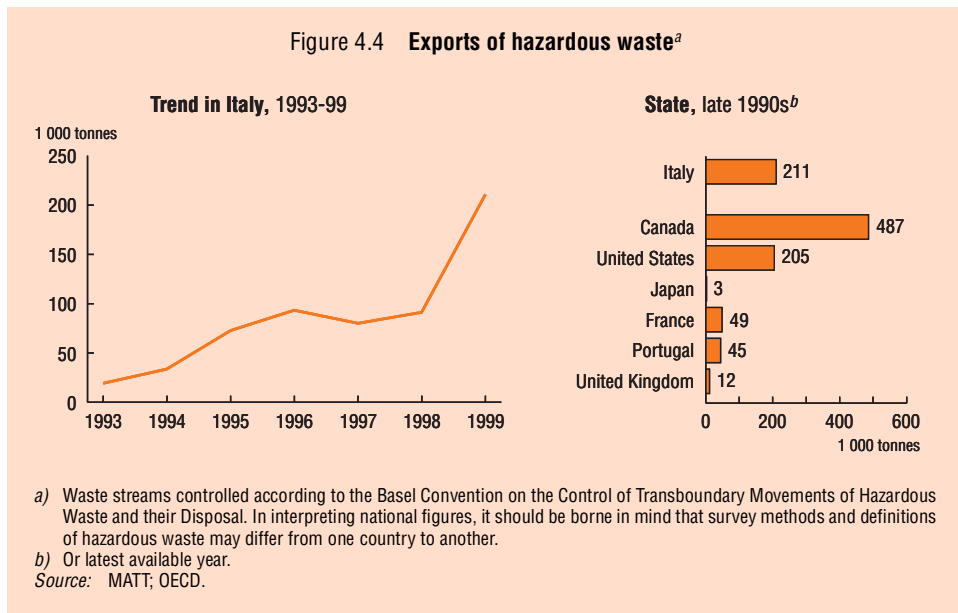
Italy ratified the 1989 *Basel Convention* in 1993. It is also bound by the OECD Council Decision on waste destined for recovery operations, and by relevant EU directives.

The volumes of *hazardous waste* exported increased significantly during the period 1993-96. Following some stagnation around 1997, a further major increase was recorded in 1999 compared with the previous period (Figure 4.4). While there is

no obvious explanation for the sudden increase, it corresponds to the transfer of responsibilities for transfrontier movements of waste to the regions. Italy is one of the largest exporters of hazardous waste among OECD countries. The volume exported in 1999 represents about 6% of its total hazardous waste generation in that year. Most hazardous waste is exported to other OECD countries, as Italy does not have suitable treatment facilities.

Illegal trafficking in waste is still an issue in Italy. In 1999, the NGO Legambiente and the Operational Unit for Environmental Protection of the Carabinieri estimated annual revenue from trafficking in toxic and radioactive waste at USD 6 billion.

Figure 4.4 Exports of hazardous waste^a



2. Focus on Selected Topics

2.1 Remediation of contaminated sites

The 1999 regulations for clean-up of contaminated sites apply to derelict land as well as to the operation of industrial plants, waste management facilities and illegal waste dumps. Target concentration values for clean-up interventions have been issued,

use of risk analysis has been introduced, and requirements for the design and planning of technical operations have been defined. Current legislation assigns liability to parties responsible for contamination or, alternatively, requires owners of contaminated sites to promote all relevant actions foreseen by applicable regulations. This represents a serious effort by Italy to cope with a situation that has been addressed for some time in many other industrialised countries.

A *national inventory* of contaminated sites is being carried out. Meanwhile, preliminary information obtained from regional remediation plans has been used to draw up an initial list of over 10 000 potentially contaminated sites. A common method has not been applied to the compilation of regional plans; it is therefore likely that the final data in the national inventory will differ from data provided by the regions.

The government has issued an initial list of 17 *sites of national interest*, to be managed and funded on a high priority basis. Preliminary emergency measures are being defined for these sites. In some cases remediation activities have already begun. At sites of national interest, of which there are expected to be over 40, clean-up costs will be partially covered by government funding (at a maximum of up to 50%). About EUR 100 million per year is currently attributed to this programme. Total government investment in the programme is estimated to be in the order of EUR 500 million.

2.2 Regional variations in urban waste generation and disposal

The volume of urban waste generated in Italy steadily increased between 1991 and 1999. Per capita generation of urban waste *varies considerably in different parts of the country* (Table 4.1). Differences are even more acute when particular regions are compared (e.g. in 1999, 606 kg per person per year in Emilia – Romagna in the North, 347 kg per person per year in Molise in the South).

The number of *urban waste disposal facilities* increased between 1994 and 1999. There were 786 authorised landfills in 1999. Disposal costs ranged from EUR 30/tonne in the South to four times that amount in the North. About 2.1 million tonnes of urban waste was incinerated at 41 plants throughout Italy (27 with energy recovery). Capacity was mostly concentrated in the North, where 28 plants processed 80% of total waste incinerated. As much as 23% of urban waste produced in Sardinia was incinerated at two facilities on the island. Most (95%) of the urban waste generated in the South was landfilled at 571 small facilities; over 200 such facilities were being operated in Sicily.

5

NATURE CONSERVATION AND BIODIVERSITY*

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the Environmental Performance Review of Italy:

- complete the *National Biodiversity Strategy*;
- protect still *preserved coastal areas* and apply strict nature conservation measures in these areas;
- develop appropriate partnerships between the national administration and regions, municipalities and civil society, in order to *improve management of national and regional parks*;
- establish a coherent national ecological network, increase *expenditure* on nature conservation, including by increased reliance on economic instruments;
- evaluate the effects of *agri-environmental and farm forestry schemes* on nature conservation;
- fully implement and enforce *landscape protection acts* and regulations;
- strictly enforce *physical planning and environmental regulations* for new buildings and construction projects.

* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental Performance Review of 1994. It also reviews progress with respect to the objective “maintaining the integrity of ecosystems” of the 2001 OECD Environmental Strategy.

Conclusions

Italy vigorously expanded its *network of protected areas* in the 1990s: total protected land, which doubled over the decade, now covers 9.1% of the territory. During that period annual public expenditure on management of protected areas increased significantly and legislation was passed to further involve regions and local communities in the creation and management of protected areas. Regional protected areas and marine nature reserves are generally well managed; in particular, there is good public perception of and public involvement in management of regional protected areas. The proposed Natura 2000 network covers 16% of Italy's total land area. In 1998 the Inter-Ministerial Committee for Economic Planning (CIPE) decided to create a coherent national ecological network. To strengthen management of *fauna and flora species*, a comprehensive inventory of Italian fauna and an enhanced database on endangered flora species have been created. The 1992 Hunting Act introduced a number of innovations aimed at protecting and managing wildlife. Many animals are now protected under criminal law. Due to the increase in the extent of protected areas and vigorous reintroduction efforts, some large mammal species (including wolves and brown bears) made a strong comeback in the 1990s. The number of farmers participating in *agri-environmental schemes* has grown steadily, accounting for almost 20% of farmland; *organic farming* has developed rapidly and now takes place on 7% of total farmland. Forest management objectives have increasingly been oriented towards protection of ecological, social and aesthetic values. With EU support for forestry plantations on abandoned farmland, forested areas increased by 1.3% during the 1990s. They now cover about 23% of the territory. Intensity of use of forest resources (i.e. harvest divided by annual growth) has remained low, at 27%. In 2000 a Framework Act on Forest Fire Prevention was enacted. Italy has prepared a National Action Programme to Combat Drought and *Desertification*. It has also promoted many initiatives to increase public awareness of desertification. Regions and river basin authorities have developed their own detailed action programmes. Italy gave its support to *landscape protection* at international level by hosting the European Landscape Convention in Florence.

Despite this real progress, much remains to be done in view of the *high pressures on natural assets from economic activities*. Many of Italy's 1 200 vertebrate and 5 600 vascular plant *species are threatened*. One-third of forest trees are moderately to seriously affected by defoliation. Some 5.5% of the territory is vulnerable to desertification. Italy should finalise its National Biodiversity Strategy to create a framework for managing fauna and flora species. Fully operationalising the management of national parks should be strengthened. It is necessary to complement designation of Natura 2000 sites to improve ecological coherence (e.g. ecological

corridors, buffer zones). Recently created *marine nature reserves* represent only a small share of coastal areas, and pressure on coastal ecosystems from tourism infrastructure development is increasing. There is an urgent need to protect *coastal areas* that are still well preserved. There is also a need to increase *expenditure on nature conservation*, including to protect biodiversity in small islands and in protected areas, for instance through increased reliance on economic instruments (e.g. access fees). In the second half of the 1990s public expenditure on nature conservation was equivalent to one-quarter of agri-environmental payments to farmers, which in turn represented less than 3 to 4% of total EU budgetary support to Italian agriculture and rural development. Nearly 47% of the territory falls within the scope of the 1985 *Landscape Protection Act* (Galasso Act), but regional landscape plans consist only of broad recommendations. Provinces should introduce territorial planning to ensure better co-ordination between landscape planning by regions and green space planning by municipalities.

1. Evaluation of Performance

1.1 Policy objectives in the 1990s

Policy objectives in the area of nature conservation and biodiversity include the following national targets and international commitments:

- extending the network of *protected areas* to 10% of the national territory by the year 2000;
- promoting *sustainable activities* in protected and non-protected areas;
- increasing knowledge of Italian *biodiversity resources* through establishing a national information network, and monitoring biodiversity by setting up an observatory within the Ministry of the Environment and Land Protection (MATT);
- implementing the *EU Habitats Directive* through the Bio-Italy project;
- implementing *EU agri-environmental* and farm forestry regulations;
- reducing and preventing *desertification*.

The 1994 *OECD Environmental Performance Review* (EPR) recommended that Italy:

- implement strictly the 1991 Framework Act on Protected Areas, with the allocation of sufficient personnel and financial resources, and a clear timetable for creating and establishing protected areas;

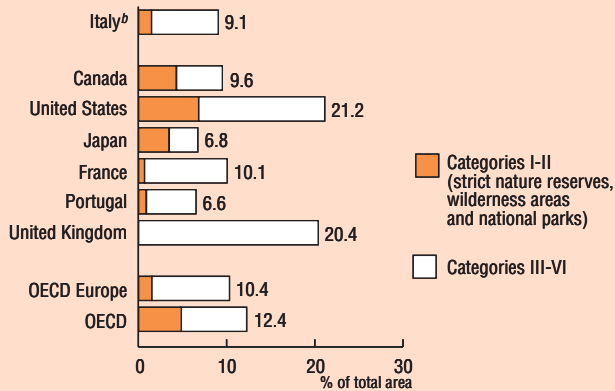
- strengthen the management of parks and natural reserves, through: incorporation of sustainable development goals in management plans; the application of agri-environmental measures of the common agricultural policy of the European Community; effective public participation mechanisms; strict enforcement of the rules applying within protected areas;
- strengthen the management of flora and fauna species by: making the “Nature Census” operational and carrying out wildlife inventories; developing a national strategy for wildlife management; fully implementing the EU “Birds” Directive; taking measures to protect wild plants;
- better protect landscapes through the reactivation of the implementation and enforcement of the Galasso Act, including setting new timetables for the formulation of landscape plans by regions, and action by central government in cases where the regions fail to act; strictly enforce environmental and physical planning rules in respect of new building and construction projects.

1.2 Protected areas

Protected land area

Italy vigorously expanded its network of protected areas in the 1990s. Protected land area doubled over the decade and now covers 9.1% of the territory (over 2.7 million hectares), close to the national target of 10% (Figure 5.1 and Table 5.1). This has been made possible under the 1991 Framework Act on Protected Areas, which defines types of protected areas: *national parks* contain ecosystems that are intact or partly altered by human intervention; *regional nature parks* are characteristic of an area’s natural, landscape and cultural values; *nature reserves* protect key species of flora and fauna, or ecosystems that are significant from the viewpoint of biological diversity or conservation of genetic resources. New national parks require national legislation as well as consent from the regions. They have therefore been created in groups. Sixteen of the 21 national parks were established in the 1990s. An additional one was created in 2002 (Appennino Tosco – Emiliano) and three more are under consideration. Regional nature parks and reserves have steadily expanded. They now account for around half the total land area under protection. Only one Ramsar wetland site was created in the 1990s (Padule della Diaccia Botrona in 1991); most Ramsar sites were designated in the 1970s.

Most protected areas are in World Conservation Union (IUCN), indicating relatively low levels of protection. Legislation was passed in 1997 and 1998 to enhance the role of regions and municipalities in the creation and *management of national parks*, particularly when preparing their socio-economic development plans.

Figure 5.1 Major protected areas,^a late 1990s

a) IUCN management categories I to VI; national classifications may differ.

b) National data.

Source: MATT; IUCN; OECD.

Table 5.1 Number and extent of protected areas, 2000

	Number	IUCN category	On land (ha)	At sea (ha)	Total protected land area (%)	Total land area (%)
National parks	21	II and V	1 255 995	93 602	45.6	4.2
National nature reserves	143	IV	113 773	–	4.1	0.4
Marine nature reserves	16	..	–	167 475	–	–
Regional nature parks	110	V	1 187 139	–	43.1	3.9
Regional nature reserves	252	IV	140 930	1 284	5.1	0.5
Other protected areas ^a	128	..	55 115	18	2.0	0.2
TOTAL PROTECTED AREAS	670		2 752 952	262 379	100.0	9.1
Wetlands of international importance (Ramsar) ^b	47	..	58 450	–	..	..

a) Includes biological habitats, natural monuments, sub-urban and urban parks, and privately managed nature reserves.

b) Wetlands cannot be added to the surface area of other protected areas, as some are included in the figures for parks or reserves.

Source: MATT.

However, local communities have not always been associated with the establishment of parks. Some local inhabitants in and around national parks feel they have been excluded from the decision making process. Some are unhappy about (or unwilling to abide by) the protection measures imposed on them (e.g. bans on hunting, more stringent regulations concerning agricultural methods and building practices). Implementation and enforcement of protection measures have been difficult for this reason, and because national parks have not always been able to spend resources allocated from the general budget.

The situation is different in the case of *regional protected areas*. On one hand, five regions (Calabria, Molise, Sardinia, Sicily and the Veneto) and the two autonomous provinces of Balzano and Trento still have to implement the 1991 Framework Act on Protected Areas. On the other, regional authorities have always attempted to involve local communities in the development process when they establish parks and reserves. They have emphasized benefits such as better employment opportunities and increased revenues. Consequently, public perceptions are positive and there is good community participation. The Foce dell'Isonzo Regional Nature Reserve in Friuli – Venezia Giulia, created in the early 1990s, provides an example. Those in charge of planning the reserve worked with the local community to reach agreement on development in the area. Today the dialogue continues. Many of the reserve's employees are local residents. Good progress has also been made in Rome, whose municipal area is the largest in Italy (Chapter 5, Section 2.1).

There is very *limited coverage of coastal habitats* by the proposed Natura 2000 network. This is partly due to the scope of the EU Habitats Directive. Nearly 60% of Italy's coastline is affected by intensive construction (which means an average of 175 buildings per kilometre of coastline). Only 30% of the coastline is totally free of construction activities; most such areas are in Sardinia. Responding to NGO pressure, the European Court of Justice recently blocked a project to build a tourist village at a proposed Site of Community Importance (SCI) in Sardinia, Is Arenas. There is an intention to transfer state-owned land (i.e. coastal areas, beaches, riverbanks and lakes) to municipalities, which would be authorised to sell them to private parties. This could lead to increased stress on ecosystems. There is an urgent need to protect well preserved coastal areas and to develop legislation applying precautionary conservation measures at these sites.

Marine nature reserves

Marine nature reserves were created more recently. Italy has 16 such reserves, of which 11 were established in the 1990s; they cover around 167 500 hectares. Only a *small share of Italy's coastal areas is protected*. Reserves are subdivided according to four levels of protection: integral reserves (zone A); general reserves (zone B), where

commercial fishing is permitted for local inhabitants; partial reserves (zone C) where there are some limitations on recreational activities; and protected zones (zone D), where there is enhanced monitoring. Most of the total reserve area is in zones B (21%), C (58%) and D (17%). Only 6 244 hectares is in zone A. In 1999 Italy, France and Monaco signed an agreement to create a 100 000 km² international marine sanctuary in the Ligurian Sea, where cetaceans and other marine mammals would be protected (Chapter 9).

Marine nature reserves are *generally well managed*. In 1998 the Marine Environment Act gave primary control of marine reserves to MATT and consolidated all regulatory, management and monitoring measures. While MATT controls these reserves, the Act states that their management can be leased by ministerial decree to public agencies, scientific institutions or recognised institutes. Nine reserves are currently managed by public administrations, three by national parks and one by WWF; another is jointly managed by WWF and a municipality. Two reserves do not yet have a management structure. Enforcement within reserves can be carried out by the police if requested by local authorities.

EU directives on Habitats and Birds

The *1992 Habitats Directive* was transposed in 1997. In 1995, with the technical assistance of major scientific institutions, the regions and autonomous provinces prepared an initial list of about 2 800 Sites of Community Importance (Bio-Italy project). Within this project habitats and species not within the scope of the directive were also listed. The official list of proposed SCIs was submitted to the EU in 1997. The number of sites has been reduced to 2 368; they represent about 4.6 million hectares, of which 1 020 outside already existing protected areas. MATT is preparing guidelines for the management of species and habitats covered by the directive (LIFE-Nature project). Site maps have not yet been published (this is the responsibility of the regions).

Under the *1979 Birds Directive* Italy has 341 Special Protection Areas (SPAs) covering nearly 1.8 million hectares. This directive was transposed into national hunting legislation in 1992, merging the interests of hunting and nature conservation. Implementation has proved difficult. In 2001 the European Court of Justice convicted Italy of allowing three species protected under the directive (the Italian sparrow, tree sparrow and European starling) to be hunted. It was Italy's fourth conviction for violating this directive.

When proposed SCIs and SPAs are added to existing protected areas, the *proposed Natura 2000 network covers 16% of Italian land territory*. Following a 1998 decision by the Inter-Ministerial Committee for Economic Planning (CIPE), it is

intended to create a coherent national ecological network, representative of most terrestrial ecosystems and including ecological corridors and buffer zones. Structural Funds have been allocated to this end.

1.3 State of biodiversity

Fauna

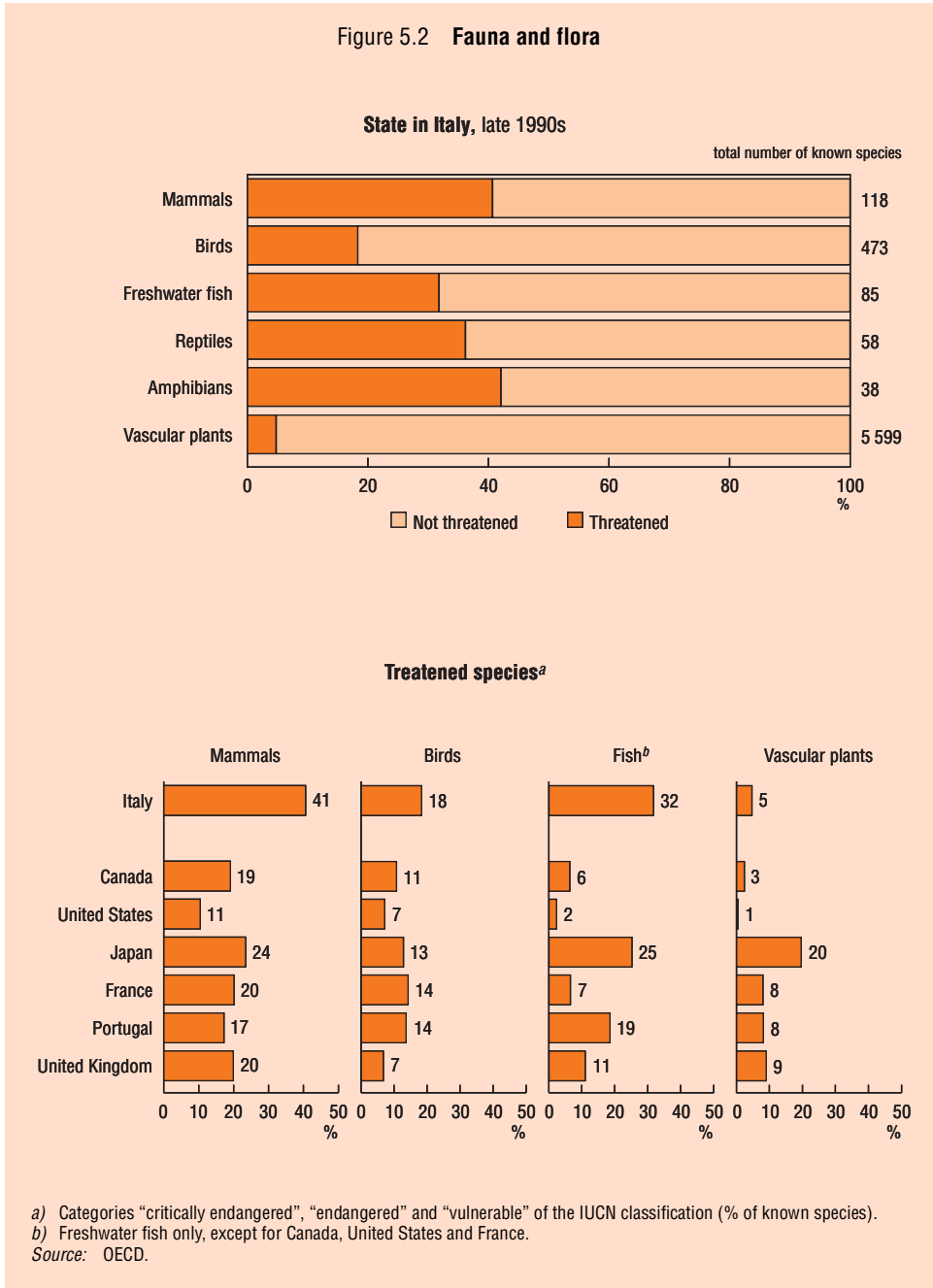
Many of the nearly 1 200 vertebrate species found in Italy are threatened (i.e. either critically endangered, endangered or vulnerable). This applies to over 40% of mammal species (including the Mediterranean monk seal and the otter), almost one-third of freshwater fish species and nearly 20% of bird species (including the Bonelli eagle). Over 40% of amphibian and 35% of reptile species are also threatened (Figure 5.2).

A comprehensive inventory of Italian fauna was recently carried out for the purpose of strengthening management of animal species. To complete this large task, MATT employed about 250 specialists from 14 countries, who gathered material on over 50 000 species (mostly invertebrate). The catalogue includes each species' geographical distribution in Italy as well as its endemic and risk status. For vertebrates a series of national atlases were produced showing regional and provincial distributions.

Due to the expansion of protected areas and vigorous reintroduction efforts, some large mammals made a strong comeback in the 1990s. The wolf can now be found throughout the Apennines. The brown bear population is also increasing. The number of deer has increased three-fold and lynx are being seen again. The wild boar, once very rare in Italy, is now so numerous that it causes problems in some areas.

The 1992 *Hunting Act* introduced a number of innovations for protecting and managing wildlife, now considered a "non-alienable patrimony of the state that should be protected in the interests of the national and international community". Regional authorities have been given powers to issue regulations on management and protection of all wildlife species. Since this Act came into force, many animals that could be hunted under the old Act (968/77) are protected by criminal law against being killed, captured or sold. Use of any form of bird trap, the capture of birds and mammals, and the removal of eggs and young are prohibited throughout Italy. Hunting is prohibited in protected areas. The Hunting Act also states that Italian agricultural, forest and pasture land is subject to wildlife hunting planning, and that 20 to 30% of this land should be devoted to fauna protection. Consequently, there has been a steady decline in hunting. The number of registered hunters fell from 1.5 million to around 700 000 in the period 1990-2000. Poaching remains an issue.

Figure 5.2 Fauna and flora



Flora

In 1992, at the request of MATT, WWF Italy published a Red List of Italian flora. About 450 species (some 8% of all vascular plants) have been surveyed and described. To strengthen management of flora, particularly with respect to land use planning, an *Enhanced Database of Endangered Species* (EDEN) was created between 1995 and 1997. This database covers all Red List species. It contains ecological, biological and distribution information on these species at the regional level and in areas designated for the Natura 2000 project. Some 5% of Italy's 5 600 species of vascular plants are threatened (Figure 5.2).

Flora conservation measures derive mainly from implementation of international agreements and of the Habitats Directive. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) calls for protection of 90 plant species present in Italy; the Habitats Directive covers 22 and the Bern Convention 75. Finalisation of the National Biodiversity Strategy would demonstrate Italy's commitment to protecting wild flora and fauna (Chapter 5, Section 2.2).

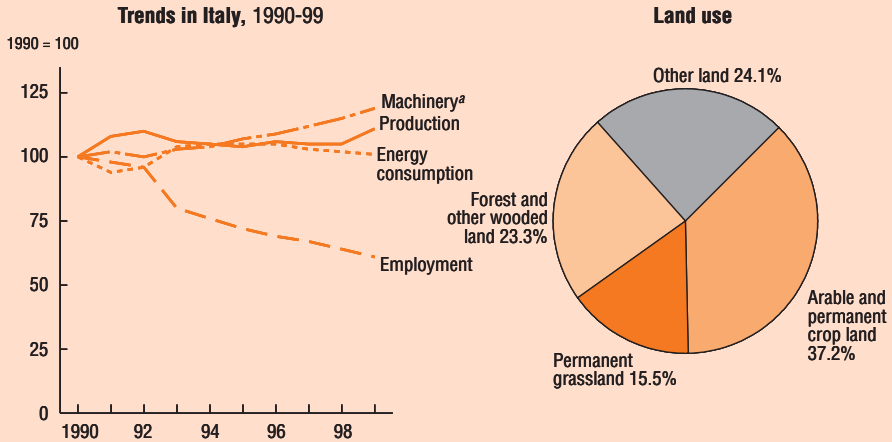
1.4 Nature conservation outside protected areas

Agricultural land

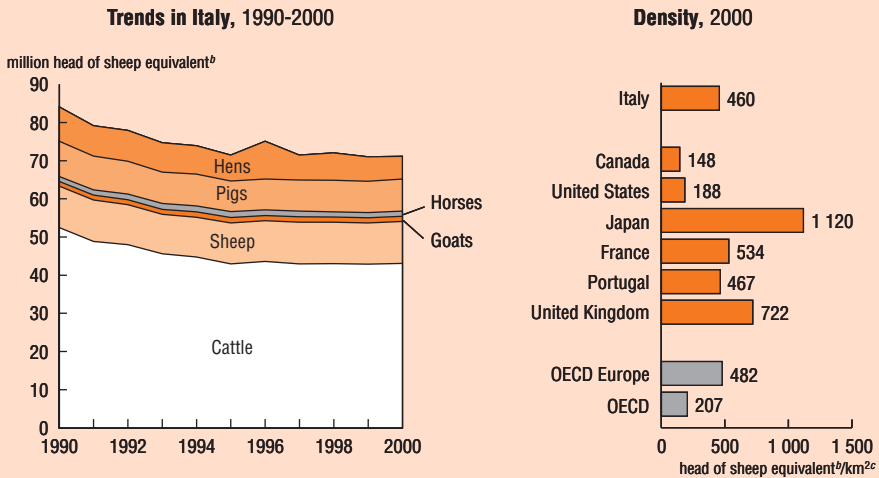
Agricultural production increased by 9% during the 1990s despite a fall in livestock density (Figure 5.3). Since 1994 the *number of farms participating in agri-environmental schemes has grown steadily*. By 1999 about 200 000 farms were involved (12% of the national total), representing around 20% of farmland or an area roughly the size of protected areas (3 million hectares). The target set at EU level in the Fifth EU Environmental Action Programme (15% farmland coverage by 2000) has been exceeded. Agri-environmental payments to farmers have followed a similar trend, amounting to EUR 1.4 billion in the period 1995-99 (including EU funds and national contributions) or almost four times national budget expenditure on nature conservation in that period (Tables 5.2 and 5.3). For the period 2000-06 the EU has allocated EUR 3.9 billion in agri-environmental payments to Italy under the European Agricultural Guidance and Guarantee Fund (EAGGF) (guarantee section); 90% of these payments are for central and northern Italy and 10% for southern (objective 1) regions. In the late 1990s total EU budgetary support for Italian agriculture and rural development under EAGGF was EUR 4 to 5 billion per year.

Agri-environmental schemes largely focus on reduction of fertiliser and pesticide use and adoption of organic farming methods (two-thirds of the area involved and three-quarters of expenditure). *Organic farming has developed rapidly*, especially in the southern regions and on the islands. Organic farming, which now takes place

Figure 5.3 Agriculture



Livestock



a) Tractors and combined harvester-threshers.
 b) In manure equivalent terms: 1 horse = 4.8 sheep; 1 pig = 1 goat = 1 sheep; 1 hen = 0.1 sheep; 1 cattle = 6 sheep.
 c) Arable, permanent crop land and permanent grassland.
 Source: FAO; OECD.

on 7% of agricultural land (Chapter 5, Section 2.3), has contributed to a decline in pesticide use. However, intensity of use is still high by OECD standards (Chapter 3). Overall fertiliser use has also decreased, but problems remain (Chapter 3).

Intensification of production over several decades has led to *abandoning the breeding of traditional livestock strains*. Several bovine (5), goat (1), sheep (12), horse (7) and donkey (4) races are now extinct. Headage payments of EUR 100 are granted farmers who breed endangered races. There are 142 such races, of which 81 have benefited from the programme; these are mainly cattle (80%) and pigs (20%).

Table 5.2 **Expenditure in the national budget on biodiversity and nature protection^a**
(EUR million)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Total 1991-2000
Natural parks	5.2	17.7	10.2	27.2	40.5	35.2	50.8	43.4	44.5	47.3	322
National protected areas	0	7.7	4	0	0.3	4.7	80.2	12.7	7.1	16.2	132.9
Special programmes ^b	–	–	–	–	–	–	49	8.1	5.7	6.7	69.5
Total	5.2	25.4	14.2	27.2	40.8	39.9	180	64.2	57.3	70.2	524.4

a) Excluding regional funds.

b) Structural Funds.

Source: MATT.

Table 5.3 **Expenditure on agri-environmental and farm forestry measures^a**
(EUR million)

	1995	1996	1997	1998	1999	Total 1995-99
Agri-environmental measures ^b	54.4	41.5	368.5	120.8	848.7	1 433.9
Farm forestry measures ^c	9.8	25.9	35.2	63.9	92.1	226.9

a) EU funds and national contribution.

b) EU regulation 2078/92.

c) EU regulation 2080/92.

Source: EU.

Forested land

The Italian peninsula serves as a bridge between various Central European and Mediterranean habitats. Its *diversified forest resources* range from the resinous and Alpine forests typical of central and northern Europe, to mixed broadleaf and Mediterranean woods, to vegetation typical of arid climates like those of North Africa. The most densely forested areas are in the northern regions of Liguria, Trentino – Alto Adige, and Tuscany. Calabria is the southern region with the densest forest cover. In Italy 60% of forested areas are owned privately, 27% by municipalities, 7% by the state and regions, and 6% by the Roman Catholic church. Forests in the north-eastern regions benefit from efficient public administration. The situation is quite different in the South, where most forests have low productivity, are more exposed to fire and are privately owned.

The main *forest policy objectives* are to maintain or expand forest cover and to improve forest management. From an original primary focus on timber production, management objectives have increasingly moved towards protection of ecological, social and aesthetic values. Mountain forests (two-thirds of total forested area) have multifunctional objectives: soil and water conservation, landscape enhancement, biodiversity protection and timber production (especially in the Alps). Flood control and landslide protection have been emphasised as a result of recent events affecting southern Italy, some of which followed mass deforestation. In 1996 Italy signed the Brdo Protocol to the Convention for the Protection of the Alps, which deals with mountain forests; this Protocol involves 35 mountain communities (out of 368) whose most prominent activity is protection of forests and the timber industry.

The most recent forest inventory was carried out in 1986. Recent estimates suggest that *forested area* increased slightly (by 1.3%) during the 1990s and now covers 6.8 million hectares, about 23% of Italian territory. Most (90%) of the 87 000 additional hectares were planted by farmers with EU support. Between 1995 and 1999 Italy received EUR 227 million to implement EU regulation 2080/92 (Table 5.3). The most active regions were Lombardy, Sicily and Sardinia. The average size of afforested areas has varied greatly between the North (3 to 7 hectares) and South (13 to 15 hectares). Intensity of use of forest resources has remained very low at 27%. This reflects the fact that over 70% of forests are located in remote mountain areas, while less than 25% (mainly poplar groves) are on the plains.

Annual surveys of the *state of forest quality* have been carried out since 1984. In 2000 34% of trees were subject to moderate or serious defoliation; insects, fungi and climatic stress were the most frequently observed causes of damage. Forest fires are a serious threat. An average of 50 000 hectares of forest per year were destroyed

by fire during the 1990s. The regions most severely affected have been Sardinia, Sicily, Calabria, Liguria and Piedmont. The Framework Act on Forest Fire Prevention, passed in 2000, strengthens and consolidates previous legislation.

Desertification

Some 5.5% of Italy's territory is vulnerable to desertification (1.65 million hectares), primarily in the South (e.g. Puglia) and on the islands. Sardinia and Sicily suffer from the worst soil degradation in Italy, including salinisation. In 1995 the government proclaimed a state of emergency for water in these two regions, following a considerable decrease in rainfall and, subsequently, of the volume of water in reservoirs. Global warming studies suggest that Sicily could potentially run out of water. Northern Sardinia, where burning vegetation to clear pastures for sheep breeding is still a deeply rooted practice, is the area most affected by summer wildfires. In Puglia irrigated olive cultivation is increasing (with EU support) in areas where there are serious water shortages. In many areas in southern Italy the abandonment of land cultivated for centuries using terracing for soil and water conservation has caused soil erosion as terracing walls have progressively collapsed. Under the EU Mediterranean Desertification and Land Use (MEDALUS) research project, studies were carried out between 1991 and 1999 in those areas most affected by desertification in order to develop a set of desertification indicators to help identify priorities for action.

Italy ratified the *UN Convention to Combat Desertification* (UNCCD) in 1997. The overall Italian Committee to Combat Desertification (ICCD) was created to implement the Convention. Chaired by MATT, ICCD is made up of representatives of ministries (Agricultural and Forestry Policy; Education, University and Research; Infrastructure and Transport; Foreign Affairs; Productive Activity), regional authorities (state-regions conference), scientific institutes (National Environmental Protection Agency; National Agency for New Technology, Energy and the Environment; National Research Council; Department for National Technical Offices) and NGOs. The National Action Programme to Combat Drought and Desertification, prepared by ICCD, was approved by the government in December 1999. ICCD also prepared Italy's national report on UNCCD implementation, released in November 2000.

The *National Action Programme to Combat Drought and Desertification* (PNA) identifies four priority areas: soil protection, sustainable water management, reduction of the impact of productive activities (particularly agriculture and forestry) and land restoration (including measures such as recovery of soils damaged by erosion). PNA does not set specific goals or targets, but requires regions and river basin authorities to develop their own detailed action programmes. Ten regions, one autonomous province and 19 basin authorities (six national, six regional and seven interregional) prepared

their programmes in 2000, covering about 87% of the territory. The Italian National Committee to Combat Desertification (CNLD) is currently analysing these proposals, with a view to preparing a comprehensive strategy for submission to the Inter-Ministerial Committee for Economic Planning (CIPE).

ICCD has promoted *many initiatives to increase public awareness* and disseminate information on desertification. In 1999 the National Observatory on Desertification was established to study and monitor desertification and promote international partnership. It is located in Asinara National Park (north-west Sardinia). In 1999 the Italian Clearing House on Desertification (ICHHD) was created to gather and disseminate, nationally and internationally, data and information on land degradation. In 1999 the Research Centre on Local and Traditional Knowledge was initiated to study and promote traditional technologies in agriculture and other activities. The Centre has its headquarters in Matera (Basilicata region).

Landscape protection

Nearly 14 million hectares (47% of the territory) falls under the scope of the 1985 Landscape Protection Act (Galasso Act). Some 3 million hectares are in mountainous areas (a total of 17 million hectares of the territory are mountainous). In individual regions, between 19% (Puglia) and 96% (Trentino – Alto Adige) of the territory is mountainous. Legislative Decree 490/1999 on *cultural and natural heritage conservation* groups the Galasso Act with an older Landscape Protection Act (1497/39) and Act 1089/39 on the protection of architectural heritage. It applies to coastal areas and lakes (a 300 metre wide strip along the water's edge), rivers (a 150 metre wide strip along each bank), mountains (above 1 600 metres in the Alps and 1 200 metres in the Apennines and on the islands), glaciers and volcanoes. Protected areas, forests and woodlands (even if damaged by fire), areas set aside for civic use, wetlands, and zones of archaeological interest are also under the scope of this Legislative Decree. Landscape protection is the responsibility of the Ministry of Cultural and Natural Heritage except in protected areas, where it is under MATT supervision.

Implementation of the Galasso Act on landscape protection requires regions to draw up *landscape plans* or territorial plans, which should include rules and restrictions concerning landscape management. It has taken the regions over a decade to comply with this Act; the first such plans have begun to appear in the last few years. Regional landscape plans consist only of broad recommendations based on 1/25 000 scale maps. Binding provisions related to landscape management are still left to municipalities via city master plans (scale 1/5 000 to 2½ 000), accompanied by more detailed plans (scale 1/500 to 1/200). It is intended to introduce "territorial co-ordination plans" to improve co-ordination between landscape planning by regions and management of

green areas by municipalities (city master plans). The provinces have begun preparing such co-ordination plans, which include landscape protection. Completion of the Nature Map of Italy would improve knowledge about the state of the natural environment, thereby facilitating preparation of land use management guidelines.

Within protected areas, *management plans* for these areas (scale 1/25 000) have precedence over landscape, territorial, urban or any other planning instruments. According to the Framework Act on Protected Areas (394/1991), such compulsory management plans have the “effect of a declaration of general public interest”. This Act allots priority funding to municipalities and provinces within national or regional parks for activities such as restoration of monuments of particular historical or cultural value or enhancement of agricultural tourism.

In 2000 Italy provided support to landscape protection efforts at the international level by hosting the ministerial conference of the Council of Europe in Florence, at which the *European Landscape Convention* was adopted. This Convention requires countries to adopt landscape protection measures locally, regionally, nationally and internationally. It provides for a flexible approach ranging from strict conservation through protection, management and improvement to actual creation. It also provides for a Council of Europe landscape award to local or regional authorities or NGOs that have introduced exemplary and long-lasting measures to protect, manage and plan landscapes. The Convention will enter into force three months after ratification by ten members of the Council of Europe. Italy is in the process ratifying it.

2. Focus on Selected Topics

2.1 Protected areas in Rome

At the height of its imperial splendour Rome possessed a great many well preserved fragments of the oak, beech, bay oak, lime, maple, pine and laurel trees that covered the Seven Hills before it was founded. Today the *natural environment and scenic settings* of the ancient Roman countryside are in many cases preserved in the heart of the city; there are even open stretches of parkland within the city walls where grassy meadows, valleys and woods have been preserved. Nearly half Rome’s total area is agricultural (129 000 hectares), greater than the cultivated area of any other city in Italy.

Following a long period of virtually unrestricted urbanisation, there is now a strategy of protecting nature and green spaces through designation of *protected areas*. This strategy receives strong support from citizens and environmental associations, which took part in the struggle to preserve these areas. In 1992 the revision of Rome’s 1962

master plan began. The new plan, approved by regional legislation in 1997, creates 13 protected areas (nine nature reserves, two regional urban parks and two natural monuments) on 14 000 hectares. In these areas there are more than 1 000 species of flora, around 5 000 species of insects and over 150 species of mammals, birds, amphibians and reptiles. A management plan is being prepared for each protected area by RomaNatura, a public agency established by the Lazio region. The new plan also creates 150 urban green spaces on 4 000 hectares and provides for protection of biodiversity and cultural patrimony on 63 000 hectares of agricultural land.

2.2 International agreements

Italy is a *party to all major international agreements* concerning nature protection and biodiversity. These include the Washington Convention on International Trade in Endangered Species of Wild Fauna and Flora (1975), the Bern Convention on the Conservation of European Wildlife and Natural Habitats (1981), the Bonn Convention on the Conservation of Migratory Species (1983) and the Ramsar Convention on Wetlands of International Importance (1986).

In 1994 Italy ratified the *UN Convention on Biological Diversity* and CIPE approved a preliminary programme for its implementation. The second National Report on the Implementation Status of the Convention was completed in 2001. However, Italy has not yet finalised its National Biodiversity Strategy.

Until 1995 around 1 000 species of animals and 1 000 species of fruits and vegetables protected by *CITES* were sequestered each year. In 1995 the Ministry of Agricultural and Forestry Policy established a monitoring and enforcement office to implement the Convention. Italy has since developed a sophisticated permitting system to track import and export of *CITES*-listed species. This system is now being adopted by other *CITES* signatories.

Italy has 47 *Ramsar sites* covering 585 km². The Framework Act on Protected Areas provides for protection and management of wetlands. MATT completed an inventory of 103 key national wetlands in 1992. A monitoring project prepared by MATT, in collaboration with the European Commission and NGOs, has not yet begun.

In 1991 Italy signed the *Salzburg Convention for the Protection of the Alps* with Austria, France, Germany, Liechtenstein, Monaco, Slovenia, Switzerland and the EU. The purpose of this framework agreement is to preserve the Alpine ecosystem while protecting the economic interests of resident populations. Since 1988 the Cross-Border Conference of the Italian, French and Swiss Ministers of the Environment has been working towards creation of an international park at Mont Blanc.

Italy has taken actions to preserve *marine biodiversity*. To contribute to protection of whales in the Mediterranean, in 1996 it signed the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS) of the Bonn Convention and the Protocol to the Barcelona Convention concerning Specially Protected Areas and Biological Diversity in the Mediterranean. In 1999 co-operation on creating a vast sanctuary for conservation of marine mammals was formalised with France and Monaco (Chapter 9). Discussions with France have taken place since 1992 on establishing an international marine park in the Bonifacio Strait to regulate fishing, merchant shipping of oil, gas and chemicals, and tourism activities.

2.3 Organic farming

In Italy the *earliest experiences* with organic agriculture date to the 1960s. During the 1970s a growing number of farmers and consumers interested in improved quality of life and consumption became involved. In the mid-1980s the first local co-ordination agencies created the National Commission for Organic Agriculture. Composed of representatives of farmers' and consumers' associations from each region, the Commission established the first nation-wide self-regulatory standards for organic farming. Following enactment of EU Regulation 2092/91 on organic agriculture, the numerous small associations of organic farmers and the producers' and consumers' committees operating in every region reorganised themselves, joining forces through mergers and a federative network. Nine officially recognised certification agencies operate in Italy today.

In the 1990s Italy's organic sector showed one of the *highest average annual growth rates in the EU*. By the end of 2000 there were nearly 50 000 organic farms (2% of all farms in the country), covering over 1 million hectares or 7% of Italy's agricultural land. Almost 25 % of the EU's organically farmed land and over two-thirds of its organic farms are in Italy. The boom in organic farming during the late 1990s was broadly driven by the support policy under EU Regulation 2078/92 on agri-environment measures. Implemented in most of the regions, it provided a good incentive for conversion to organic farming, at least by extensive traditional farmers. In May 2001 the Ministry of Agricultural and Forestry Policy began a nation-wide publicity campaign promoting organic products with television, newspaper and magazine advertisements. The campaign is funded by a new 2% tax on synthetic pesticides. Efforts have also been made to promote organic farming in protected areas, and many parks have created their own labels for organic products. Organic produce is widely served in schools throughout Italy. Since 1999 the daily catering services of municipalities and hospitals are required to serve some organic produce.

Part II

SUSTAINABLE DEVELOPMENT

6

ENVIRONMENTAL – ECONOMIC INTERFACE*

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the Environmental Performance Review of Italy:

- further integrate environmental concerns within *agriculture, energy and transport policies*, as well as health and tourism policies;
- expand the use of *strategic environmental assessment*;
- finalise adoption of the *Environmental Strategy for Sustainable Development*, with quantitative targets and time limits, based on full consultation with various stakeholders;
- review the economic efficiency and environmental effectiveness of *incentive schemes* granted in terms of subsidies, tax rebates or exemptions to various economic sectors;
- review existing *environmentally related taxes* (e.g. transport taxes, taxes on energy products) with a view to restructuring them in the light of a green tax reform;
- foster implementation of *cost recovery schemes* in waste management and extend such schemes to water management;
- make more systematic use of *integrated economic and environmental analyses* (e.g. cost-benefit analysis, data on public and private environmental expenditure) in environmental policy-making, with the aim of achieving sustainable development objectives more cost-effectively;
- mainstream *sustainable development* policy into institutional arrangements and decision-making at all levels (central, regional and local);

* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental Performance Review of 1994. It also reviews progress with respect to the objective “decoupling environmental pressures from economic growth” of the 2001 OECD Environmental Strategy. It takes into account the latest OECD Economic Surveys of Italy.

Recommendations (cont.)

- raise the level of *investment in environmental infrastructure* by fully disbursing funds allocated to MATT and by seeking additional private funding; increase the rates of environmental charges, non-compliance fines and inspection fees and generalise their use;
- evaluate the *cost-effectiveness* of the mixes of policy instruments in place (economic, regulatory, voluntary, land use planning);
- set *charges* at levels that create incentives and are in accord with the user and polluter pays principles, and explore the potential for pollution trading mechanisms;
- streamline the *legal environmental framework* and facilitate its implementation through setting clear environmental policy targets and implementation deadlines;
- complete the *establishment of ARPAs* and strengthen their role as the main monitoring and inspection bodies;
- further strengthen national EIA procedures and develop *regional EIA procedures* and IPPC permitting;
- strengthen the implementation of, and introduce environmental requirements in, regional *physical planning*, city master planning and building permitting.

Conclusions

Integrating environmental concerns in economic decisions

Italy has continued to make good progress in *decoupling* environmental pressures from economic growth, through low energy intensity and reduction of SO_x and NO_x emissions as well as through reduction of phosphate fertiliser and pesticide use. *Institutional integration* has improved. Progress in environmental planning is being achieved through preparation of the Environmental Strategy for Sustainable Development. Strategic Environmental Assessment has been developed as a tool to promote sustainable development (e.g. General Transport Plan). *Market-based integration* continues to rely on high energy prices (due to taxes and historically high pre-tax energy utility prices), which have yielded environmental benefits; Italy's *energy intensity is lower than that of any other OECD economy*. Italy also relies increasingly on environmentally related taxes and environmental charges: a carbon tax on mineral/fossil fuels and a pesticide tax have been phased in; vehicle taxation has shifted to take greater account of environmental impacts (e.g. through being calculated on engine size); water and waste charges increased significantly in the latter part of the 1990s.

Nonetheless, further efforts are needed to *decouple* municipal waste generation from economic growth. *Co-ordination* among different administrations is not very well established, particularly at the technical level. Involvement of the Inter-Ministerial Committee for Economic Planning (CIPE) in environmental and sustainable development issues is to be encouraged. *Economic analyses* (e.g. cost-benefit analysis) carried out are insufficient to ensure cost-effective achievement of environmental objectives. *Taxes and charges* are not well targeted with respect to emission impacts, and there are many exemptions. Environmentally related taxes have had a low incidence. Some environmental charges are difficult to enforce, while some (e.g. a plastic bag fee) have been abandoned. Water prices are still low; they fall well short of overall operating costs, let alone providing financing for urgently needed capital expenditure. Water for agricultural use is priced extremely low, and groundwater resources are often abstracted illegally.

Implementing more effective and efficient environmental policies

In the last ten years Italy has met or almost met a number of its domestic objectives and international commitments (e.g. SO₂, heavy metals and POPs emissions, separate waste collection, nature protection, agri-environmental progress). It has also considerably strengthened its *national environmental institutions*, issued new environmental legislation, and further devolved environmental responsibilities to regional and local authorities while keeping responsibility for strategic planning and legal co-ordination at the central level. The human and budgetary resources of the Ministry of the Environment and Land Protection (MATT) have been increased very significantly; new directorates deal with sustainable development and protection from flooding, landslides and other natural disasters. The National Environmental Protection Agency (ANPA), which provides MATT with scientific and technical support, has been growing. There has been important *progress on environmental legislation* (e.g. water, waste reforms), mainly prompted by EU environmental directives. The competence of regions and local authorities with respect to environmental and land management has been strengthened during the *devolution process* (1997 Bassanini Act). Regional Environmental Protection Agencies (ARPAs) are being established to perform inspection and enforcement on request from regions. Some regions have begun to introduce integrated permitting for existing plants. *Enforcement* of environmental policies benefits from the actions of the Unit for Environmental Protection of the Carabinieri, placed at the disposal of MATT; prosecution for violations of environmental legislation can rely on specialised judges and specific provisions in the criminal code (e.g. concerning water pollution, forest fires). *Environmental impact assessment* of projects, carried out at national level since 1989, has been an effective instrument. From 1996 all regions have been required to issue EIA laws, though

today only half the regions have operational EIA procedures. The 1990s saw the development of *economic instruments* and *voluntary agreements*: measures were adopted to curb air pollution; a carbon tax was introduced in January 1999; implementation of new, tailored tariffs for waste collection and disposal is in progress in many parts of the country; and reforms are being implemented to improve water management. Eco-auditing schemes and eco-labelling have also been developed.

However, the overall picture is mixed, as Italy has not met a number of its commitments or is not on the way to meet them (e.g. NO_x, NMVOCs, ammonia emissions, several water goals and targets, climate change, ODA). Transposition of EU legislation has often entailed significant delays. The IPPC Directive has not yet been transposed. Despite efforts made, the Italian legal framework remains too fragmented and complex. In many instances, taxes and charges have been set at a modest level and have had only modest environmental benefits. Cost recovery for water and waste services should be improved; progress needs to be made towards implementation of the *polluter pays and user pays principles*. There are important disparities in the environmental institutional capacity and the effectiveness of *regional and local authorities*. Many urban areas in southern Italy do not have city master plans. Some 15 to 20% of buildings are constructed without permits. Regions and provinces make little use of territorial planning for environmental purposes and risk management. An integrated approach to coastal zone management is lacking. There has been a relatively *low level of investment in environmental infrastructure*, possibly linked to delayed decisions associated with the devolution process and low spending capacity in the case of allocated funds.

1. Towards Sustainable Development

1.1 *Decoupling environmental pressures from economic growth*

Economic and environmental trends

In the period 1990-2000 Italy's GDP grew by 17%, below the EU mean (Chapter 6, Section 3.1). Annual growth was 1.6% per year, compared with the EU mean of 2.1%. Industrial production increased at about the same rate as GDP (Table 6.1). Increases in agricultural production, energy supply and energy consumption were less than those in GDP. Total road traffic grew much more rapidly than GDP, by 50% during the decade.

Against these economic trends, SO_x emissions decreased by 46% in the 1990s. This is all the more remarkable in that strong *decoupling* had already been achieved in the 1980s (when SO_x emissions fell by 55% while GDP increased by 24%). NO_x emissions fell by 24% in the 1990s, reversing an upward trend in the 1980s. CO₂

emissions continued to increase (by 6%) during the 1990s (Chapter 2). Pressures on water resources seem to have declined, mainly for technical reasons (more water efficient irrigation practices). Fertiliser and pesticide use also decreased. Water quality in major rivers and lakes did not improve (Chapter 3). The increase in municipal waste generation (33%) was higher than growth in GDP.

Table 6.1 Decoupling of economic trends and environmental pressures
(% change)

	1980-90	1990-2000
Selected economic trends		
GDP ^a	24	17
Population	1	2
GDP ^a /capita	24	15
Agricultural production	-8	9
Industrial production ^b	21	16
Total primary energy supply	9	11 ^c
Energy intensity (per GDP)	-12	-2 ^c
Total final consumption of energy	12	12 ^c
Road traffic ^d	52	50 ^c
Road freight traffic ^e	49	25
Selected environmental pressures		
CO ₂ emissions from energy use ^f	7	6 ^c
SO _x emissions	-55	-46 ^c
NO _x emissions	24	-24 ^c
Water abstraction	0 ^g	0 ^h
Municipal waste	42	42 ^c
Nitrogenous fertiliser use	-13	-1 ^c
Phosphate fertiliser use	-14	-20 ^c
Pesticide use ⁱ	-17	-13 ^j

a) At 1995 prices and purchasing power parities.

b) Includes mining and quarrying, manufacturing, gas, electricity and water.

c) To 1999.

d) Based on vehicle-kilometres.

e) Based on tonne-kilometres.

f) Excluding marine and aviation bunkers.

g) To 1989.

h) From 1989 to 1999.

i) Refers to formulation weight.

j) To 1997.

Source: OECD; IEA.

Overall decoupling assessment

Italy has made *overall good progress* in decoupling a number of environmental pressures from economic growth. However, the fact that waste generation continues to increase at a rate over twice that of GDP is a cause for concern.

Among positive results, there has been strong decoupling of emissions of *major air pollutants* from economic growth. Italy ranks the fourteenth and tenth lowest, respectively, among OECD countries in SO_x and NO_x emissions per unit of GDP. This reflects progress with respect to energy intensity, energy mix (increased use of natural gas) and environmental management. Italy has the lowest energy intensity among OECD countries. Weak decoupling of CO₂ emissions from GDP during the 1990s resulted from continuing decreases in energy intensity (–2%). Traffic is increasing rapidly; Italy has one of the highest rates of motorisation (vehicles per capita) of any OECD country for both four-wheeled and two-wheeled vehicles (Chapter 8).

Decoupling use of commercial *fertilisers and pesticides* from agricultural production is partly the result of the EU's Common Agricultural Policy (CAP) reforms. Through elimination of support mechanisms for the production of certain crops, farmers have been discouraged from pursuing higher production levels. From the mid 1990s agri-environmental measures have promoted less intensive use of agro-chemicals through integrated and organic farming. Reductions in pesticide use are due in particular to lower use of herbicides and insecticides following the introduction of new low-dosage products.

1.2 Sustainable development and institutional integration

Environmental concerns in national strategic and economic planning

Italy supports the concept of sustainable development at national and international levels. Over the years, inter-ministerial consultation and co-ordination have improved economic and environmental policies and encouraged sustainable development through the *Inter-Ministerial Committee for Economic Planning* (CIPE). In 1993 a National Plan for Sustainable Development was approved by CIPE. This plan was organised around six sectors (energy, industry, agriculture, transport, tourism and waste) but did not specify quantified objectives or time horizons. It remained largely a statement of intentions without implementation perspectives.

More recently, the Ministry of the Environment and Land Protection (MATT) has prepared a *draft Environmental Strategy for Sustainable Development* setting out the main sustainable development principles: integration of environmental concerns in sectoral policies; preference for prevention over curative actions; and increased

efficiency in natural resource use. Four main priority areas are identified: climate change and ozone layer protection; protection and sustainable use of nature and biodiversity; quality of the environment and quality of life in cities and the countryside; and sustainable management of natural resources (e.g. improved water and waste management, production and consumption patterns). Objectives, indicators, quantitative targets and time limits are defined for these areas. Following inter-ministerial and stakeholder (e.g. industry, NGOs) consultations, this document is proceeding towards formal approval by CIPE in the spring of 2002.

The *Commission on Sustainable Development*, established within CIPE in 1998, includes representatives of MATT, the Ministry of Infrastructure and Transport (MIT) and the Ministry of Productive Activity. There is still a need to strengthen institutional integration of environmental administrations and those concerned with health and tourism. Stakeholders, particularly environmental NGOs, have complained about their late involvement in the process of developing the Environmental Strategy for Sustainable Development. The 2000 Document of Economic and Financial Planning (DPEF) for the period 2001-04 should be readjusted following approval of the Environmental Strategy for Sustainable Development by CIPE.

Environmental concerns in regional programmes

In 1998-99, EUR 17.6 billion (i.e. 11% of investment by Italian enterprises in machinery and equipment) was made available for *economic development in depressed areas*, leading to the creation of 148 000 jobs in these areas. Enterprises in the industry, tourism and electric power sectors submit plans to banks selected by the Ministry of Productive Activity. Environmental indicators are used in the selection process, together with economic and social indicators; these indicators have recently been modified with the aim of increasing environmental compliance. Such efforts to introduce stricter environmental cross-compliance in the funding of private businesses should be pursued.

Italy benefits from *European Structural Funds* and related programming of investment. In the second (1994-99) Community Support Framework (CSF), the European Regional Development Fund (ERDF), together with national matching funds, allocated EUR 1.5 billion for environmental protection. About three-quarters was allocated to central and northern Italy (EUR 805 million), for areas affected by industrial decline (objective 2) and to rural areas (EUR 345 million) (objective 5b). The remainder was allocated to southern Italy, in the seven regions where development is lagging (objective 1), through a multi-regional programme (EUR 107 million) and a programme specific to Sicily (EUR 250 million). Not all the funds allocated have actually been disbursed though the share of available resources spent has significantly increased compared with the previous CSF (1989-93).

For the third CSF (2000-06), ERDF environmental support for Italy was increased to reach a total EUR 1.9 billion in EU funds and national matching funds (against a total ERDF allocation for Italy of EUR 28.5 billion in EU funds only). Implementation is entirely through regional programmes, including EUR 1.2 billion for central and northern regions and 0.7 billion for those in the South. For the southern regions (objective 1) a *new strategic approach* to the design and implementation of Structural Funds interventions has been adopted. Regional operational programmes have been structured in six priority areas: natural resources, cultural resources, human resources, local development systems, urban areas and service networks. Funds allocated to the priority area of natural resources amount to over EUR 0.7 billion. The new approach aims at building and strengthening effective management systems, especially at the local level. It relies on the Network of Environmental Authorities, which brings together all Italy's national and regional environmental authorities. The Network's purpose is three-fold. co-operation among national and regional authorities in managing Structural Funds interventions should be fostered throughout the entire implementation cycle. Criteria and principles should be established for ex ante environmental evaluation of Structural Funds interventions. And development of environmental data for monitoring and analysing Structural Funds interventions should be promoted. The 2000-06 programming cycle also includes environmental indicators to determine access to additional resources (i.e. those of the performance reserve established by the CSF).

This new strategic approach goes in the right direction, with a shift from a sectoral to a cross-cutting (inter-sectoral) approach to environmental protection. However, implementation will require substantial strengthening of *regional and local institutional capacities* and significant improvement of MATT's economic expertise. A six-year project (Operational Environment Project), implemented by MATT and financed by EU Structural Funds, seeks to provide local administrations in southern Italy with skilled environmental staff. Some 150 experts advise the Regional Environmental Protection Agencies (ARPAs) on how to assess the environmental implications of the Community Support Framework, as well as those of national and regional operational programmes. This is a very innovative capacity building project.

Strategic environmental assessment

Environmental assessment of plans and programmes has not yet been introduced in Italian national legislation. However, in 1999 MATT, together with the National Environmental Protection Agency (ANPA), developed a set of guidelines for strategic environmental assessment (SEA). Such guidelines have been applied to *three main plans or programmes*: the new General Transport Plan, preparations for the 2006 Turin Winter Olympics, and plans for European Structural Funds interventions in the

period 2000-06. By the end of March 2003, the government is to issue a Legislative Decree establishing the rules for implementing the EU SEA directive (2001/42).

1.3 Sustainable development and market-based integration

Sectoral subsidies

The Italian *electricity industry* benefits from financial supports (budgetary subsidies, subsidies to capital, VAT below the general rate). A 1997 OECD IEA (International Energy Agency) study estimated the monetary equivalent of such support at EUR 7 200 million. According to the study, removal of this support would potentially lead to a reduction in CO₂ emissions of 22.3 million tonnes per year by 2010 (i.e. 5.3% of total emissions).

Italian *agriculture* also benefits from financial supports, reflecting an EU shift from market price support to budgetary payments based on area and animal numbers. Market price support, which is based on output, tends to stimulate production and input use more than do acreage and headage payments. To address the resulting environmental damage, environmentally friendly farming practices have been promoted (e.g. through EU agri-environmental measures). Uptake of these measures by farmers has increased sharply in recent years: total spending on agri-environmental measures jumped from EUR 120.8 million in 1998 to EUR 848.7 million in 1999. Organic farming has developed at one of the highest rates in Europe, from 13 000 hectares in 1990 to over 1 million hectares in 2000 on some 50 000 farms (Chapter 5).

Financial support to the fishery sector, granted by the Italian government and the EU, amounted to EUR 128.5 million in 1996 and EUR 80.8 million in 1997. The bulk of this assistance concerned direct payments in 1996 (62%) and general services in 1997 (69%). Mediterranean fish catches have been decreasing: 376 000 tonnes in 1995 compared with 276 000 tonnes in 1999 (Chapter 9).

Environmentally related taxes on energy and transport

Italy uses a number of environmentally related taxes (Table 6.2). *Fuel taxes* overall are high compared with those in other OECD countries (Chapter 6, Section 3.2). Petrol taxes are the ninth highest among OECD countries; diesel taxes rank fifth. Taxes on unleaded petrol are higher than those on diesel, though external costs (especially adverse health impacts) associated with PM₁₀ emissions from diesel vehicles are recognised by most studies as much higher than those from petrol fuelled cars (Figure 8.1). The tax on fuel oil used for heating purposes is the highest in any OECD country. Other taxes and charges applying to transport activities include taxes on vehicle sales and annual registration, which have been restructured to reflect their

Table 6.2 Selected environmentally related taxes on transport and energy, 2001

	EUR	Remarks
Excise taxes on energy products		
Gas oil	0.4/litre	
LPG (for heating)	0.19/litre	
Heavy fuel oil with sulphur content below 1%		
– For heating	0.06/kg	
– For industrial use	0.031/kg	
Heavy fuel oil with sulphur content above 1%		
– For heating	0.13/kg	
– For industrial use	0.06/kg	
Kerosene (for heating)	0.037/litre	
Natural gas		Exemptions: no tax on natural gas used for electricity generation. Tax differentiation between North and South introduced in 1994.
– For industrial use (combustion)	0.01/m ³	
– For other industrial use		
in the North	0.173/m ³	
in the South	0.124/m ³	
– For heating		
in the North	0.043/m ³	
in the South	0.038/m ³	
– For other household use		
in the North	0.078/m ³	
in the South	0.038/m ³	
Consumption tax on electricity		
Household use (since 1996)	2.1/MWh	Exemptions: no tax on first 150 KW/month (households). Provincial and municipal taxes are levied. VAT: 10%.
Industrial use	3.0/MWh	
Excise tax on fuels		
Leaded petrol (phased out Jan. 2002)	0.57/litre	Exemptions : no tax for navigation (including fishing) and civil aviation. Regional tax of EUR 0.03/litre.
Unleaded petrol	0.54/litre	
Diesel	0.39/litre	
Kerosene (propellant)	0.32/litre	
LPG (propellant)	0.28/kg	
Carbon tax		
Leaded petrol	0.01/litre	
Unleaded petrol	0.02/litre	
Vehicle tax		
Minimum	2.5/KW/year	Annual tax based on engine power.
Vehicle sales tax		
Minimum	77.5/unit	Registration tax.
Maximum	201.4/unit	
Road toll		
Minimum	0.10/km	Based on distance travelled.
Maximum	0.15/km	

Source: OECD/EU database on environmentally related taxes.

environmental impact to some extent by relating the rate to engine power/capacity. All vehicles pay tolls on the highway network; heavy vehicles also pay a charge based on their annual mileage.

Electricity taxes on consumption per kWh are applied to both households and industry. Industry rates are decreasing and are lower than the rates for households.

Energy and fuel tax *exemptions* and refunds are granted for competitive reasons to the manufacturing and some non-manufacturing sectors. For instance, there is a lower rate on coal use by plants with high energy capacity. Rebates on fuel excise duties are given in the commercial transport sector. Italy also provides compensation measures for disadvantaged regions.

In 1998 a *CO₂ tax on mineral fuels* was phased in. The revenue is recycled through reduced rates for social security contributions on labour (60.5%) and compensation measures (31.1%). Tax rates have responded to increases in world prices (Chapter 6, Section 2.4).

1.4 Environmental expenditure and its financing

Pollution abatement and control expenditure and environmental expenditure

Since the 1994 OECD Environmental Performance Review, significant progress has been made regarding statistical information on the environment and analyses of the interface between the economy and the environment. A permanent unit for environmental accounting, established in 1994, is now part of the National Accounting Directorate of the National Statistical Institute (ISTAT). Among the advanced projects is the collection of data on environmental protection expenditure by the central government (Table 6.3). Estimates of *environmental expenditure by municipalities* are available up to 1995 (Table 6.4). Figures on spending by other levels of government (regions and provinces) do not appear to be available. Funds available to MATT increased during the 1990s (Table 6.5).

Pollution abatement and control (PAC) expenditure by the public and private sectors is not easy to distinguish using available data. *Total annual expenditure of around 0.9-1% of GDP* (approximately EUR 10 billion) is estimated by OECD and other studies. Spending in Italy would thus be below the EU average (1.2% of GDP). The results of ISTAT surveys on household expenditure (1995 through 1997) and companies' expenditure (1997) conducted within the 1999 Intermediate Census of Industry and Services are not yet available. While private expenditure by enterprises tends to focus on air pollution, public expenditure (including expenditure by municipalities) is largely on water, including waste water treatment.

Table 6.3 Environmental expenditure in the national budget, 1995-96
(EUR million)

	1995		1996	
	Planned	Actual	Planned	Actual
Operating expenditure ^{a)}	408	238	309	196
Investment expenditure	3 679	1 071	2 677	1 062
<i>of which:</i>				
Waste water treatment	478	26	337	46
Air	137	15	113	21
Soil protection	1 308	540	1 027	489
Waste	132	54	45	45
Nature	289	50	214	59
Sensitive areas	346	65	271	123
Industrial risks	25	10	14	0
Policy measures	281	74	104	17
Environmental information	15	1	8	2
Research	22	2	16	2
Environmental employment	291	5	153	13
Water management	355	228	375	245
Total	4 087	1 309	2 987	1 259

a) Excluding expenses of staff and office maintenance.

Source: ISTAT.

Table 6.4 Environmental expenditure by municipalities, 1987-95
(EUR million)

	1987	1992	1993	1994	1995
Land use	313	568	539	582	697
Supply	960	1 245	1 319	1 238	1 305
Waste water treatment	1 228	1 628	1 505	1 481	1 592
Waste	1 872	3 245	3 386	3 698	3 862
Nature	278	410	403	400	457
Total environment	4 651	7 096	7 152	7 398	7 912

Source: ISTAT.

Financing mechanism

The principle of multi-annual planning of public action for the purpose of environmental protection, introduced by Act 305/1989, gave rise to two general planning documents (the three-year Environmental Protection Programmes, 1989-91 and 1994-96) which allotted about EUR 5.2 million per year to environmental protection. The procedures used in disbursing the funds earmarked for these programmes proved so complex and rigid that about 80% of financial resources intended for environmental protection remained unspent. Multi-annual planning for environmental protection was therefore discontinued at the end of 1996. A Transitional Environmental Protection Programme was adopted, with a fixed financial endowment of about EUR 167.9 million for the period 1997-99 to ensure enforcement of EU regulations. It included the Extraordinary Plan for Completion and Rationalisation of Water Collection and Purification Systems, the National Programme for Reclamation and Ecological Recovery of Polluted Sites, and programmes aimed at meeting Italy's Kyoto commitments. In the context of devolution of powers to the regions and provinces, Italy is undertaking significant reforms regarding management of public expenditure, which will have impacts on the management of public funds for implementation of environmental and sustainable development policies.

Table 6.5 Financial resources of the Ministry of the Environment and Land Protection, 1991-2000
(EUR million)

	Allocation	Balance ^a	Financial resources available	Actual expenditure	Financial resources spent (%)
1991	448	1 517	1 966	64	3
1992	382	1 882	2 265	480	21
1993	241	1 759	2 000	124	6
1994	228	1 931	2 159	238	11
1995	473	1 919	2 392	343	14
1996	531	1 147	1 677	362	22
1997	386	1 060	1 446	265	18
1998	602	966	1 567	622	40
1999	1 664	880	2 544	1 315	52
2000	1 684	1 181	2 865	1 180	41

a) From previous year.

Source: MATT.

Competitiveness

It is difficult to find any hard evidence that economic growth or the competitiveness of Italian enterprises have been hindered by environmental regulation. Rather, studies point to other factors such as rigidity of labour markets or the short-term effects of necessary reforms of public financing and administration. In Italy many *traditional manufacturing activities and small and medium-sized enterprises (SMEs)* have remained in place, and it has been suggested that more should be done to help them meet higher environmental standards. Overall, average firm size is not increasing. The existence in some sectors of “clusters” of small firms is an interesting development in the context of environmental management. The government is making significant efforts to bring smaller firms within the scope of fiscal regulations; parallel efforts should be made to support conformity with higher environmental standards.

Company management is increasingly aware of the significance of environmental problems in terms of possible impacts on companies’ image, their relations with stakeholders and exposure to financial risk. There is also growing awareness of the potential value of new “*environmental*” markets and of consumer demand for “green” goods and services. Italy has developed a strong recycling industry, with the technical and productive capacity to exploit secondary raw materials.

2. Environmental Policy Implementation

2.1 Objectives

Italian environmental policy pursues *three main goals*: to provide needed environmental infrastructure (particularly for waste management and waste water treatment); to promote sustainable growth (particularly through policy integration in the energy and transport sectors); and to develop innovative technologies and tools such as sustainable urban development. More specific environmental policy objectives are included in the draft Environmental Strategy for Sustainable Development.

To strengthen national environmental institutions and management, the *1994 OECD Environmental Performance Review (EPR)* recommended that Italy:

- strengthen the human and budgetary resources of the Ministry of the Environment and review its structure, to better integrate into governmental action as a whole the operational concepts of sustainable development;

- provide the National Environmental Protection Agency (ANPA) with the capacity to give the Ministry of the Environment scientific and technical back-up, and to monitor the state of the environment;
- provide financing for environment protection action programmes arising from national, European Community or international initiatives;
- promote the simplification of current legislation and regulations in order to make them easier to enforce;
- strengthen accountability mechanisms (e.g. result-oriented management and post facto reporting of performance) for all levels of government and industry.

To strengthen regional and local environmental management, the *1994 EPR* recommended that Italy:

- define more clearly the regions' responsibilities with regard to environmental management (environmental information, regional state of the environment reports, specialised implementation and enforcement agencies, etc.);
- ensure that the regional and local levels are endowed with adequate financial resources, by instituting environmental charges and eco-taxes and streamlining the procedures for transferring funds from the central level to the regional and local levels;
- identify and report on weaknesses or gaps in the enforcement of environmental protection measures at the regional or local level by setting up mobile monitoring teams at the central level; such teams could further review the consistency of implementation among regions and implementation by regions of international commitments.

To integrate environmental and economic decision making, the *1994 EPR* recommended that Italy:

- establish or re-establish appropriate mechanisms of inter-ministerial consultation and decision making concerning environmental and economic policies, and sustainable development at both Ministerial and administrative levels; establish more systematic consultations with representatives of industry and NGOs in decision-making on environmental and economic policies;
- assess critically the results of the first three-year Environmental Management Programme and monitor the implementation of the second one; launch the preparation of the next one, with appropriate contributions from the various ministries involved in strategic planning related to environmental matters, consultation of the various tiers of government, and coverage of both domestic and international environmental issues;

- implement the national plan adopted in response to Agenda 21, with full inter-ministerial co-operation; its principles and measures should be integrated in yearly financial laws and the three-year Environmental Management Programmes and their updates;
- extend the use of economic instruments in relation to regulatory and other instruments such as voluntary agreements, at national and local levels; fully consider the potential for and the effects of eco-taxes in the case of a general or partial tax reform;
- ensure that an environmental assessment is integrated in government plans and programmes that have potential environmental significance;
- extend environmental impact assessment (EIA) procedures to projects included in Annex II of the European Community directive, and integrate into EIA procedures all existing environmental permitting requirements to establish a system requiring a single environmental permit;
- strengthen the role of the Ministry of the Environment in the dissemination and sharing of positive management experiences at local and regional level (e.g. waste management, nature protection);
- use land use planning and land use regulation more effectively to serve pollution abatement, nature conservation and risk prevention.

2.2 Institutional framework

At the national level

Since 1994, Italy has strengthened and reformed its environmental institutions very significantly. The human and budgetary resources of the Ministry of the Environment and Land Protection (MATT) have been increased. Act 344/1997 on the development of environmental activities and employment provided for a doubling of Ministry staff from 532 in 1997 to 1 050 in 2001 (there were 164 in 1992). The *budgetary allocation for the Ministry* remained limited until 1999 (in the order of EUR 250-500 million/year) but has since more than tripled (over EUR 1 500 million/year in 1999 and 2000) (Table 6.5). Actual expenditure increased annually from 10-20% until 1999 to 40-50% in 1999 and 2000. The Ministry's budget increased substantially in 2001, mainly to respond to emergency situations related to land protection.

In June 2001, pursuant to Legislative Decree 300/1999 outlining the reform of governmental organisation, *MATT* superseded the Ministry of the Environment, which had been the national environmental management authority since 1988. *MATT* was given responsibilities (previously under the supervision of the Ministry of Infrastructure and Transport) for forecasting, preventing and protecting against landslides,

flooding and other hydro-geological phenomena. Like the earlier Ministry of the Environment, it is concerned with air quality and industrial risk, water quality and quantity, marine protection, waste and reclamation of contaminated sites, nature protection, soil conservation and environmental impact assessment. In 2000 a service whose purpose is to further sustainable development policies was set up within the Ministry.

The *National Environmental Protection Agency (ANPA)*, established in 1994, has been provided with the capacity to give MATT scientific and technical backup. ANPA carries out state of the environment reporting, assists MATT in setting environmental standards and monitors nuclear radiation. ANPA also acts as the focal point for promotion and dissemination of Eco-Management and Audit Schemes (EMAS) and ISO 14001. The range of ANPA's activities has been extended over time (Chapter 6, Section 3.3). Its budgetary allocation has regularly increased (EUR 60 million in 2001). The agency currently has 400 staff, but is expected to have 625 with the inclusion of the Department for National Technical Services (DSTN). The State Auditors' Court recently identified a lack of direct and functional connections between MATT services (which are organised according to environmental media) and the services requested of ANPA. However, it is also important for ANPA to retain its analytical independence. A number of other national agencies are involved in environmental policy support and implementation (Chapter 6, Section 3.3).

At the regional and local levels

Until 1997 the state had primary competence over environmental policy implementation and delegated some functions to the regions (Chapter 6, Section 3.4). The Public Administration Reform Act (Bassanini Act, 59/1997) more clearly defines regions' responsibilities for environmental management. Through Legislative Decree 112/1998 *most environmental and land management powers have been transferred to the regions and to local authorities* and remaining responsibilities have been defined. The state continues to define environmental quality objectives and general policy objectives, taking account of EU legislation. However, strategic environmental (and sectoral) planning is now entirely vested in the regions. Policy implementation is supervised by the regions, which can delegate part of this responsibility to the provinces. Inspection and enforcement are under the authority of the provinces and municipalities.

Under Act 61/1994 each region was requested to establish a regional environmental agency within a 180-day period. Numerous delays have been experienced, especially in the southern regions. Only 18 of 21 agencies have been set up so far (Table 6.6). In some areas of northern and central Italy *Regional Environmental Protection Agencies (ARPAs)* and Provincial Environmental Protection Agencies

(APPAs) are already quite well developed and strong (Chapter 6, Section 3.5). Priority has now been given to the development of ARPAs in southern Italy (the Mezzogiorno), with ANPA scientific and technical support and twinning agreements with northern and central agencies. As recommended by the OECD in 1994, the ARPA network has been organised to carry out inspection and monitoring on request by regions, by local health authorities or directly by judicial authorities. ARPAs do not function as the regional arm of ANPA, but have been placed under direct supervision of the regional authorities. Once this network of agencies is fully operational, it will facilitate information exchange, improving inspections and knowledge concerning the state of the environment. ARPAs receive financial support from

Table 6.6 Regional Environmental Protection Agencies, 2001

Region ^a	Budget (EUR million)	Staff	Entry into operation
Emilia – Romagna (Bologna)	64.2	886	1996
Veneto (Venice)	54.8	867	1997
Piedmont (Turin)	53.0	1 111	1997
Lombardy (Milan)	46.7	790	2000
Tuscany (Florence)	43.5	588	1996
Campania (Naples)	40.4	330	1998
Lazio (Rome)	35.9	Sba. ^b	2000
Liguria (Genoa)	22.0	310	1998
Friuli – Venezia Giulia (Trieste)	19.8	268	1999
Marche (Ancona)	17.4	219	1999
Umbria (Perugia)	11.0	Sba. ^b	2000
Sicily (Palermo)	10.4	Sba. ^b	2001
Abruzzo (L'Aquila)	9.1	Sba. ^b	2000
Basilicata (Potenza)	8.2	58	1999
Bolzano ^c	4.9	175	1996
Valle d'Aosta (Aosta)	3.6	50	1997
Trento ^c	2.5	125	1996
Calabria (Catazanro)	1.0	20	2000
Molise (Campobasso)	Tbd ^d	Tbd ^d	2001
Puglia (Bari)	Tbd ^d	Tbd ^d	Tbd ^d
Sardinia (Cagliari)	Tbd ^d	Tbd ^d	Tbd ^d
Total	448.4	5 797	

a) The regional capital is in brackets.

b) Staff being appointed.

c) Autonomous provinces of the Trentino – Alto Adige region.

d) To be determined.

Source: ARPA Lombardy.

regional health funds and (for specific projects) from the state or regions. Budgetary allocation to ARPAs amounted to almost EUR 450 million in 2001. They currently have a staff of nearly 6 000.

While they have been granted increased fiscal autonomy, *the regional and local levels are not always endowed with adequate financial resources*. Italy's fiscal system remains highly centralised; regions and local authorities collect only 18% of total fiscal revenues (compared with 4% in the early 1990s). About 13% of fiscal revenues accrue to the regions, 1% to the provinces and 4% to municipalities.

2.3 Regulatory instruments

Legal framework

In recent years efforts have been made to update the legal environmental framework to speed up transposition of EU environmental legislation and ratify international conventions (Table 6.7). In particular, there have been significant changes in legislation on waste management (1997) and water management (1999). Nonetheless, *the legal framework has remained excessively fragmented*. The devolution process has generated a completely new corpus of regional environmental legislation, technical standards and administrative rules. Transposing EU legislation requires approval by the state and the regions, which can entail delays. Therefore, transposition has often been implemented through emergency procedures in emergency situations (subject to approval by the Parliament within 60 days) or through delegation of powers to the government (Legislative Decrees and Presidential Decrees).

Licensing of industrial installations

Permits are required for construction or operation of all *industrial activities* (Act 30/1994). They must be obtained where concerns about water, air, waste, soil, nature and cultural patrimony exist. Under Legislative Decree 334/1999 industrial activities that fall within the scope of the EU Seveso directive are required to notify MATT, the Ministry of Health and regional authorities when production or storage exceeds established thresholds. These activities mainly include refineries, LPG and chemical storage sites. The normal permitting procedure applies, but these installations must first obtain a fire prevention certificate (issued by provincial fire brigades), a permit by the Ministry of Productive Activity and a conformity certificate (issued by mayors). Permits are renewable every one to three years. There are specific permits for urban development activities that are subject to municipal and regional provisions. New or upgraded infrastructure requires a permit establishing the environmental impact assessment (EIA) procedure.

Table 6.7 Selected environmental legislation,^a 1966-2001

GENERAL ACTS	
349/1986	Act creating Ministry of the Environment and transposing EU's EIA directive (85/337)
305/1989	Act introducing three-year Environmental Protection Programmes
142/1990	Local Administration Reform Act
61/1994	Act creating National Environmental Protection Agency (ANPA)
640/1994	Act ratifying 1991 Espoo Convention on transboundary environmental impact assessment
39/1997	DLg transposing EU directive on freedom of access to environmental information (90/313)
59/1997	Public Administration Reform Act (Bassanini Act)
372/1999	DLg transposing EU directive on integrated pollution prevention and control (96/61)
108/2001	Act ratifying 1998 Aarhus Convention on access to environmental information
178/2001	PD creating Ministry of the Environment and Land Protection (MATT)
AIR	
615/1966	Clean Air Act, amended by PDs in 1970 and 1971
203/1988	PD transposing EU directives on industrial air pollution (84/360) and on ambient air quality (80/779, 82/884, 85/203)
277/1988	CFC Act
39/1992	Act ratifying 1988 Sofia Protocol to the Convention on long-range transboundary air pollution (NO _x emissions)
549/1993	Ozone Protection Act, amended in 1997
65/1994	Act ratifying UN Framework Convention on climate change
146/1995	Act ratifying 1991 Geneva Protocol to the Convention on long-range transboundary air pollution (VOC emissions)
447/1995	Noise Pollution Act
413/1997	Act on Benzene Pollution Prevention
207/1998	Act ratifying 1994 Oslo Protocol to the Convention on long-range transboundary air pollution (SO _x emissions)
351/1999	DLg transposing EU directive on ambient air quality (96/62)
35/2001	Act ratifying 1997 Amendment to the Montreal Protocol to the Convention on the protection of the ozone layer
36/2001	Act on Protection from Electromagnetic Radiation
WATER	
319/1976	Act on water pollution control (Merli Act), superseded by DLg 152/99
470/1982	PD transposing EU directive on bathing water quality (76/160), as amended
515/1982	PD transposing EU directive on surface water quality (75/440), as amended
24/1988	PD transposing EU directive on drinking water quality (80/778)
130/1992	PD transposing EU directive on water quality for fish life (78/659)
131/1992	PD transposing EU directive on water quality for shellfish life (79/923)
132/1992	DLg transposing EU directive on discharge of dangerous substances to groundwater (80/68)
133/1992	DLg transposing EU directive on discharge of dangerous substances to water (76/464)
36/1994	Water Resource Act (Galli Act)
172/1995	Act on Water Pollution Fines
171/1996	Act ratifying 1992 Helsinki Convention on protection of transboundary rivers and lakes
152/1999	DLg on water pollution control and transposing EU directives on urban waste water treatment (91/271) and on nitrates (91/676)
16/2000	Act ratifying 1996 European Agreement on inland waterways of international importance
31/2001	DLg transposing new EU directive on drinking water quality (98/83)

Table 6.7 Selected environmental legislation,^a 1966-2001 (cont.)

WASTE	
915/1982	PD transposing EU directives on waste management (75/442, 76/403, 78/319)
441/1987	Waste Management Act, repealed by DLg 22/97
475/1988	Industrial Waste Disposal Act
95/1992	DLg transposing EU directives on waste oil disposal (75/439, 87/101)
340/1993	Act ratifying 1989 Basel Convention on transboundary movements of hazardous waste
70/1994	Act on simplification of waste declarations
349/1995	Landfill Tax Act
575/1996	Waste Recycling Act
22/1997	DLg transposing EU directives on municipal (91/156), hazardous (91/689) and packaging (94/62) wastes (Ronchi Decree)
209/1999	DLg transposing EU directive on disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCBs/PCTs) (96/59)
SOIL	
183/1989	Soil Conservation Act
170/1997	Act ratifying 1994 UN Framework Convention on combating desertification
87/1998	Act ratifying 1991 Convention between Italy and Switzerland on natural and man-made risk prevention
267/1998	Act on Hydro-geological Risk Prevention and on Landslide-prone Areas in Campania
SEA	
979/1982	Marine Pollution Control Act
435/1991	PD on navigational safety
220/1992	Marine Protection Act
268/1997	PD transposing EU directives on shipping of hazardous substances (93/75, 96/39)
464/1998	Act ratifying 1990 London Convention on oil pollution preparedness, response and co-operation
498/1998	Act ratifying 1995 New York Agreement to the Convention-Law of the sea
175/1999	Act ratifying 1995 Amendment to the Barcelona Convention on protection of the Mediterranean Sea against pollution
177/1999	Act ratifying 1971 Brussels Convention on an international fund for oil pollution damage
193/1999	Act ratifying 1996 Syracuse Protocol to the Convention on protection of the Mediterranean Sea against pollution
51/2001	Act on Maritime Traffic Control and Oil Pollution Prevention from Ships
NATURE AND LANDSCAPE	
874/1975	Act ratifying 1973 Washington Convention on international trade in endangered species
812/1978	Act ratifying 1950 Paris Convention on bird protection
503/1981	Act ratifying 1979 Bern Convention on European wildlife and natural habitats conservation
42/1983	Act ratifying 1979 Bonn Convention on migratory species
431/1985	Landscape Protection Act (Galasso Act), superseded by DLg 490/99
448/1986	PD ratifying 1971 Ramsar Convention on wetlands
394/1991	Framework Act on Protected Areas
157/1992	Hunting Act transposing EU directive on wild birds (79/409)
778/1992	Natural and Cultural Heritage Act
124/1994	Act ratifying 1992 UN Convention on biological diversity
228/1997	Act on Forest Fire Prevention
357/1997	PD transposing EU directive on natural habitats conservation (92/43)
120/1998	Act ratifying 1994 New York Revised Agreement on tropical timber
174/1999	DLg on forest fire fines
490/1999	DLg on cultural and natural heritage conservation
353/2000	Framework Act on Forest Fire Prevention
391/2001	Act ratifying the 1999 trilateral Agreement creating a Mediterranean marine sanctuary for mammals

Table 6.7 Selected environmental legislation,^a 1966-2001 (cont.)

AGRICULTURE	
223/1988	PD transposing EU directives on pesticide registration (76/631, 81/187, 84/291), amended by DLg 52/1997
99/1992	DLg transposing EU directive on use of sewage sludge in agriculture (86/278)
194/1995	DLg transposing EU directive on pesticide sale (91/414)
574/1996	Act on Agronomic Use of Waste Water from Olive Mills
52/1997	DLg transposing EU directive on pesticide re-registration (92/32)
ENERGY	
9/1991	Act on Partial Deregulation of the Energy Market
10/1991	Act on Energy Savings and Development of Renewable Energy
280/1994	DLg transposing EU directive on reductions in crude oil consumption (87/441)
526/1994	PD on EIA for offshore oil extraction
481/1995	Act establishing the Regulatory Authority for Electricity and Gas
79/1999	DLg transposing EU directive on the internal market in electricity (96/92)
164/2000	DLg transposing EU directive on the internal market in gas (98/30)
INDUSTRY	
175/1988	PD transposing EU directive on major accident hazards (82/501 or Seveso I)
334/1999	DLg transposing EU directive on major accident hazards (96/82 or Seveso II)
TRANSPORT	
97/1992	DLg transposing EU directive on sulphur content in liquid fuels (93/12)
16/1997	Act ratifying the 1957 European Agreement on the transport of dangerous goods by road
403/1997	Act on Car Scrapping Incentives
41/1999	DLg transposing EU directives on transport of dangerous goods by rail (96/49, 96/87)
153/2000	Act ratifying the 1997 Geneva Amendment to the Customs Convention on international transport of goods by road (TIR)

a) Including Acts, Legislative Decrees (DLg) and Presidential Decrees (PD).

Source: MATT.

Sewage discharge *licences*, subject to the Merli Act (319/1976), are granted on a permanent basis when discharge quality complies with standards and on a provisional basis when it does not. Municipalities issue permits for pollutant discharges to public sewerage and for water abstraction. The validity of water abstraction permits ceases when river flow is below the (legally defined) environmental minimum. Abstraction for irrigation is subject to specific legal provisions (DLg 275/1993). Waste incineration requires an EIA and four permits (building, construction and operation, air pollutant emissions, discharges). Location of an incineration plant, which is subject to the Ronchi Decree (22/1997), must be authorised by the regional authority; since 1999

authorisation has been granted only for incineration with heat recovery. Landfills require a permit and an EIA; a national EIA is required in the case of industrial waste. Permits for atmospheric emissions are subject to Presidential Decree 203/1988.

Pursuant to Legislative Decree 372/1999, integrated pollution prevention and control (IPPC) permits will progressively apply to all types of industrial plant. Around 600 installations covered by the EU IPPC directive are under national competence (335 power plants, 169 hazardous waste storage facilities, 76 chemical factories, 17 refineries, four cast iron and steel factories); over 8 000 (mostly SMEs) are under regional competence. Italy has actively contributed to preparation at EU level of best available technology (BAT) reference documents, with technical support from the National Agency for New Technology, Energy and the Environment (ENEA). In 1999 ANPA determined BAT standards for the petrochemical sewage treatment plants at Porto Marghera (Venice). Most importantly, some regions have begun to introduce *integrated permitting*.

Involvement by many authorities makes the permitting process extremely lengthy. MATT and other ministries (Cultural and Natural Heritage, Productive Activity, Infrastructure and Transport) are responsible for projects of national interest. Projects of regional interest are under the shared competence of regions, provinces, municipalities, the regional inspectorates of ministries, fire brigades, health authorities and river basin authorities. ARPA's role is to provide technical guidance. *Streamlining of permitting procedures* is one of the key measures of the Bassanini Act. Legislative Decree 112/1998 introduced a simplified procedure giving municipalities that have established a special administrative unit ("one-stop shop") authority to grant permits in the administrative areas of environmental protection, urban development, health, and industrial risk. In smaller municipalities these functions can be carried out jointly with other permitting authorities. Since 1998, therefore, two permitting procedures have existed. Under the simplified procedure, construction of new plant or enlargement/restructuring of existing plant is simply notified to the municipality together with self-certification and following EIA (as appropriate). The normal procedure continues to apply to activities such as hazardous waste treatment that present greater risk.

Compliance and enforcement

Until recently there were many *environmental inspection and enforcement agencies*. Through their provincial agencies, the ARPAs are progressively becoming the main inspection bodies (except for nature conservation or marine protection). ARPAs should soon be in a position to provide necessary technical support to the Unit for Environmental Protection of the Carabinieri (NOE), which continues to function as the main environmental enforcement agency. Since its creation in 1986, NOE has been

placed at MATT's disposal. The judicial police powers of NOE staff, and the assistance they may obtain from the main Carabinieri Corps, greatly facilitate criminal prosecutions. Moreover, water pollution (in 1995) and forest fires (in 1999) have been included in the criminal code. In 1995 a Parliamentary Commission on illegal movements of waste was established; these, too, might soon be covered by the criminal code. Other inspection and enforcement bodies include the provincial health services (Aziende Sanitarie Locali, ASL) for drinking and bathing water quality. The provincial fire brigades (supervised by the Ministry of Civil Defence) are responsible for fighting forest fires. The State Forest Corps (under the Ministry of Agricultural and Forestry Policy) contributes to nature conservation and the Coast Guard (at the disposal of MATT since 1999) to marine protection.

Inspections are carried out systematically when complaints are lodged, and routinely in the case of industrial activities for which permits have been issued. However, illegal activities are not checked for. There is always administrative follow-up in the event of non-compliance; an adjustment period is generally allowed and a new inspection scheduled to verify corrective measures. The *number of violations of environmental legislation fell* during the 1990s, but they still account for one-third of the 30 000 inspections carried out annually by NOE (Table 6.8).

Table 6.8 **Activities of the Unit for Environmental Protection of the Carabinieri, 1992-2000**

	1992		2000		Change 1992-2000 (%)	
	Violations	Fines (EUR '000)	Violations	Fines (EUR '000)	Violations	Fines
Air	918	2	499	52	-46	2 400
Noise	400	0	97	4	-76	..
Electromagnetic radiation	..	..	0	41	..	..
Waste water	6 918	42	1 791	318	-74	654
Solid waste	18 433	154	6 313	3 767	-66	2 351
Radioactive waste	..	..	64	0	..	..
Nature	88	0	25	102	-72	..
Landscape	1 634	8	846	3	-48	-69
Areas and activities at risk	27	5	21	0	-22	..
Total	28 418	211	9 656	4 287	-66	1 925

Source: NOE.

Since 1997 NOE has monitored untreated sewage and dumping in major rivers and the sea (the Clean Sea Programme) during summer holidays. The number of violations has remained high (around 5 000 a year). A green telephone number is available to report illegal dumping. Illegal construction is an on-going concern; 15 to 20% of buildings continue to be constructed without a permit.

To *simplify inspection* of waste legislation implementation, since 1996 companies and municipalities must complete a uniform annual waste declaration (MUD) and submit a report to the Chamber of Commerce, including details of treatment (recycling, re-use, incineration, landfill). In 1996 about 500 000 companies and 7 000 municipalities completed these declarations (Chapter 4). Act 93/2001 provides for self-monitoring of EMAS companies at the time of permit renewal. Since the EU's Network for the Implementation and Enforcement of Environmental Law (IMPEL) was created in 1993, Italy has actively contributed to its activities with direct participation first by MATT and, from 1997, by ANPA. This has involved co-ordinating projects and hosting events to examine regulatory aspects and control.

2.4 Economic instruments

While compliance with environmental legislation still primarily relies on regulatory instruments, Acts 488/1992 and 598/1994 have led to *wider use of economic instruments* (Table 6.9). The 1997 Financial Act further introduced environmentally related fiscal instruments (Chapter 6, Section 1.3). The 2001 Financial Act provides for the creation of a sustainable development fund that would grant financial incentives for improvements to production processes.

Measures have been adopted to *curb air pollution*. With respect to fuels, excise taxes on unleaded petrol and LPG have been lowered and a ban on leaded petrol took effect on 1 January 2002. From 2000, tax concessions are granted to companies producing green fuels such as bioethanol, biodiesel and methane and "ecological" fuel additives. It is estimated that up to 14% of fossil fuel emissions could be reduced through use of green fuels. Excise taxes on most polluting oil products have been increased. Direct payments for disposal of old vehicles were introduced in 1997, with higher rates for more polluting vehicles and incentives for the purchase of cleaner ones. It is estimated that up to 40% of CO emissions from vehicles without catalytic converters could be eliminated through incentives to convert to cleaner vehicles. Act 344/1997 established additional measures: emission charges on SO₂ and NO_x from large combustion plants, a small regional tax on aircraft noise, and government incentives for construction of photo-voltaic plants. To promote energy saving, income tax concessions are now granted for renovation of old buildings.

Table 6.9 Economic instruments, 2000

Instrument	Rate	Remarks
WATER		
User charge for public water supply (PWS) and public waste water treatment (WWT)	From EUR 0.15/m ³ (Milan) to EUR 0.89/m ³ (Pistoia) (PWS) From EUR 0.23/m ³ (Turin) to EUR 0.54/m ³ (Bolzano) (WWT)	Municipalities (or, by delegation, water companies) set PWS charges at different rates for households and industry. WWT charges for households are based on the volume of public water supplied, as are charges for industrial sewage discharged to public sewerage. Industry is not charged for storm water discharged to public mixed sewerage.
Abstraction charge for direct water withdrawal		Revenue goes to MIT (main network) and to regions (secondary network). Charges apply to withdrawal of surface and groundwater. A uniform volumetric rate applies across the country. Rate varies according to type of use (agriculture, fisheries, industry, electrical cooling).
Non-compliance fines		Revenue goes to regions to finance water pollution control projects. Fines apply to water withdrawal and waste water discharges. Rate varies according to type of violation.
NATURE		
Entrance fee		Applies to entrance, transit and parking of motor vehicles in some protected areas.
Non-compliance fines		Revenue goes to local authorities. Rate varies according to type of violation.
AIR		
Air pollution charge		Revenue (EUR 58 million) goes to central budget. Applies to large combustion plants (above 50 MW). There are no charges on VOCs, solid particles, LPG, CO ₂ (or CO or total organic C).
SO _x	EUR 53.55/t	
NO _x	EUR 104.55/t	
Carbon tax		Revenue (EUR 1 144 million) used to reduce social contributions on labour, reduce excise tax on diesel fuel, finance projects on energy efficiency and develop renewable energy use. Rate varies according to type of fuel.
Direct payments for purchase of clean vehicles		Expenditure (EUR 8 million) from the central budget. Rome, Florence and Naples also have earmarked funds. Applies to purchase of electric, hybrid, methane and GPL vehicles by individuals.
NOISE		
Regional noise tax	Not yet defined	Revenue goes to MIT (40%), MATT (25%) and the central budget (35%). Used to compensate population living in vicinity of airports. Airline companies pay charges for each landing and take-off. Rates vary according to type of aircraft.

Table 6.9 Economic instruments, 2000 (cont.)

Instrument	Rate	Remarks
WASTE		
User charge for municipal waste collection and disposal (TARSU)		Municipalities set charges based on space for households and on type and size of activity for businesses. Allows only partial cost recovery.
New user charge for municipal waste collection and disposal (will gradually replace TARSU over the period 2000-08)	Fixed element Variable element	Municipalities (or by delegation, waste companies) set the fixed charge element (investment expenditure) and a variable element (based on the quantity of waste generated). Designed to allow full cost recovery. For households the quantity of waste is based on family size. For industry it is set according to type of activity and can be reduced if packaging waste is properly collected.
Provincial environmental charge	1-5% of TARSU	Revenue is used to finance some provincial environmental activities.
Product charge on packaging materials	EUR 72.66/t (plastic) EUR 25.82/t (aluminium) EUR 15.49/t (steel) EUR 15.49/t (paper) EUR 5.16/t (glass) EUR 2.58/t (wood)	Revenue goes to National Consortium of Packaging Material (CONAI), which transfers a portion to municipalities where packaging waste is properly collected. Charge based on quantity placed on the market by producers, importers and users, members of CONAI.
Product charge on lead-acid batteries	EUR 0.21-1.65/battery	Revenue goes to Obligatory Consortium for the Recovery of Used Lead-acid Batteries and other lead waste (COBAT). Charge based on battery amperage. Charge paid by producers and importers with right to transmit to distributors.
Product charge on lubricating oil	EUR 0.0454/kg	Revenue goes to Obligatory Consortium for Waste Oil (COOU). Charge based on quantity of lubricating oil put on the market by producers and importers. In 2000 over 90% of waste oil collected was regenerated.
Product charge on vegetable oil	Not yet defined	Revenue goes to Obligatory Consortium for Waste Vegetable Oil (CONOE). Charge based on quantity of oil put on the market by producers and importers.
Landfill tax	EUR 0.001-0.01/kg (municipal waste) EUR 0.005-0.01/kg (hazardous waste)	Revenue (90%) goes to regions. Charge paid by landfill operators with obligation to transmit to users. To be abolished for municipal waste when the new user charge will be fully in place.
Non-compliance fines		Revenue goes to local authorities (provinces, municipalities). Rate varies according to the type of violation.
MINERALS		
Regional charge for quarrying	EUR 0.052-3.10/m ³	Revenue goes to municipalities. Used to finance environmental projects.

Source: MATT.

A *carbon tax* (to be phased in over five years) was introduced in January 1999 to help reduce Italy's emissions as agreed under the Kyoto Protocol. The carbon tax relates to the quantity of CO₂ emitted from combustion of different energy products. As it is designed, by 2005 the tax rate for petrol will increase by 7% and that for diesel by 12%; the rate for coal will increase by 42% and that for natural gas by 2%. The heating oil rate will increase by 52% for residential users and by 61% for industry, while the LPG rate will fall. In November 1999 Italy temporarily suspended the carbon tax on petrol and diesel to keep inflation within acceptable limits. It was reintroduced in June 2000, following the decision of the Organisation of the Petroleum Exporting Countries (OPEC) to increase output. There are plans to extend the carbon tax to all sources of CO₂ emissions, rather than linking it to specific sources. The government also announced that the 2002 carbon tax rate would remain at the same level as that in 2000. This rate freeze is intended to prevent rising energy prices.

To rationalise use of water resources and finance sewage collection and treatment, the Galli Act (36/1994) introduced a system of *user charges related to water management*. The aim has been to delegate water pricing to the local level, and to provide for vertical and horizontal integration of water and waste water services. Following a period of controversy, the Galli scheme entered its early phase of implementation (Chapter 3). This has included some significant (but not yet adequate or universal) increases in user charges. The Galli Act also introduced abstraction charges, though with very low rates for farmers. In 1999 a tax on pesticides was introduced (2% of the retail price).

During the period 2000-08 user charges for municipal *waste collection, treatment and disposal* will gradually become proportionate to the quantity of waste generated. These charges will be set at a cost recovery level rather than being based on property value. A landfill tax introduced in 1995 (though at a modest level) will be abolished for urban waste when the new user charge is fully in place. A regional charge has been introduced for waste disposal at open air facilities; 10% of the revenue is transferred to provinces to support their environmental activities. Product charges have continued to be levied on producers and importers of packaging material, lead batteries and lubricating oil, leading to improved waste collection, recycling and recovery (Chapter 4). A similar scheme was recently introduced for vegetable oil.

Significant progress has been made in implementing water management reforms, including significant increases in user charges. New tariffs for waste collection and disposal are being implemented in many parts of Italy. They are intended to provide better incentives to separate waste streams and minimise households' overall waste production, as required by law. Often, however, the *level of charges and taxes is too modest* to produce significant environmental benefits. This is the case with charges on

SO₂ and NO_x emissions, as well as the landfill tax and water abstraction charges. There are no other specific charges on emissions to air (Chapter 2).

It would be useful to explore the *potential for trading between emission sources*. An overall emission limit could be imposed on large plants, a cluster of firms or an industry sector. Within that “bubble” firms could determine how to meet the overall target; this could potentially apply to air quality, water discharges and abstraction, or solid waste generation. Consideration should be given to developing arrangements for formal trading between regulated sources.

2.5 Environmental impact assessment of projects

The situation with respect to environmental impact assessment (EIA) in Italy is quite unusual. Directive 85/337 has not been transposed by the Parliament. EIA has been introduced in a provisional form through Act 349/1986, which created MATT and gave it power to regulate EIA. At the national level, EIAs of projects were first carried out in 1989 following issuance of Council of Ministers’ Decree 377/1988. *Implementation by regions has been delayed* pending progress towards reform of public administration. While awaiting a final settlement by Parliament, several regions have issued their own regional EIA laws. These include the projects in Annex II of Directive 85/337 and sometimes even introduce Strategic Environmental Assessment (SEA). The five special status regions and three of the 15 ordinary status regions were the first to issue EIA legislation. In 1996 a Presidential Decree extended application of EIA to Annex II projects and specified that regions should enact suitable legislation within nine months. While no region developed such legislation during this nine-month period, several (Piedmont, Lombardy, Emilia – Romagna) have initiated legislative changes or developments. These activities will take into account the requirements of EU directives 97/11 and 2001/42.

Since the extension of the EIA procedure to regions, the activities of MATT’s EIA Commission have increased. It has averaged 50 assessments per year since 1997, compared with 25 before. Since 1997, 224 national projects and 1 039 regional and provincial projects have been subject to EIA. The environmental quality of projects under EIA has improved, as shown by the decreasing share of opinions indicating that elements were lacking in a study (7% in the period 1997-2000 compared with 13% earlier). The *types of projects subject to EIA* have evolved: the shares of waste treatment facilities and hydropower-producing dam projects have fallen, while those of oil research and exploitation, roads and highways have increased (Table 6.10). This partly reflects the extension of EIA procedures to projects in Annex II of directive 97/11. In particular, Presidential Decree 526/1994 included specific provisions on EIA for oil research and exploitation (e.g. in the Po basin, Basilicata and the Adriatic). The Parliament is considering a new EIA framework law prepared pursuant to the EU directive.

Table 6.10 **Activities of the Environmental Impact Assessment Commission**
(number of projects)

Projects	Recommendations 1989-96 ^a				Recommendations 1997-2002 ^b			
	Favourable	Unfavourable	Pending	Total	Favourable	Unfavourable	Pending	Total
Hazardous waste disposal	54	17	5	76	30	4	0	34
Hydropower-producing dams	18	4	9	31	14	8	0	22
Railways	10	0	5	15	9	1	0	10
Motorways	12	2	0	14	53	2	3	58
Ports	5	4	5	14	13	0	2	15
Thermoelectric power plants	12	0	1	13	12	0	0	12
Oil research and exploitation	0	0	0	0	31	8	0	39
Miscellaneous	28	3	1	32	39	4	1	44
Total	139	30	26	195	201	27	6	234

a) EIA of projects began in 1989.

b) Until end of February 2002.

Source: MATT.

2.6 Voluntary initiatives

Negotiated agreements between industry and government

In the 1990s there were an increasing number of *negotiated agreements* concerned with environmental protection (Chapter 6, Section 3.6). These agreements fall into the categories of “participatory administration” (Act 241/1990) or “negotiated planning” (Act 662/1996 and 1997 CIPE decision). The former are targeted agreements elaborated through active participation by stakeholders; the latter are framework contract agreements covering programme or territorial impacts. In both cases environmental objectives can be global or local. In May 2002 MATT and Confindustria signed a voluntary agreement to improve the efficiency of industrial processes through the development of environmental certification schemes. Greater accountability to the general public (disclosure) would give these agreements more credibility.

Unilateral commitments by industry

There has been *very low uptake of environmental management schemes by industry* in absolute terms (number of firms) or relative to total number of companies (Table 6.11). As in most EU countries, ISO 14001 certification has occurred more

rapidly than registration for the EU's Eco-Management and Audit Scheme (EMAS). The voluntary EMAS scheme was activated in 1998, following entry into force of EU Regulation 1836/93. The number of registered EMAS industrial sites increased from three in 1998 to 83 by January 2002. Eight more sites are in the process of registering. Italian companies are still far from considering EMAS registration a key element of production, partly due to high costs to SMEs. About 65% of registered firms are large, 19% are of medium size and 16% are small; 86% of EMAS registrations are in northern Italy (particularly Lombardy and Emilia – Romagna, where industrial activity is concentrated). Registration has taken place mainly in chemical and energy production companies and, more recently, the waste sector. Once transposed, the EU's new EMAS legislation (761/2001) will require registered companies to report annually on their environmental efficiency at branch, regional and national levels. The national accreditation scheme for certification bodies (SINCERT) reports on ISO 14001 certification. Around 1 400 ISO 14001 certificates had been issued by January 2002; 60% were in northern Italy, mostly in chemical and energy production companies. Close attention should be paid to accreditation of ISO certifying firms.

Pursuant to EU Regulation 880/92, Italy has developed a voluntary *eco-labelling scheme* for products. Since this scheme was activated in 1997, interest has grown on the part of Italian companies and consumers. Ten Italian firms use eco-labelling for a total of 99 products, mainly tissue paper, textiles, dishwashing detergent and shoes. ANPA provides technical support to verify respect for ecological criteria, thus ensuring proper use of eco-labels. EU Regulation 1980/2000 provides for extension

Table 6.11 **Environmental management schemes uptake by industry, 2001**
(number of companies)

ISO 14001		EMAS	
Japan	7 155	Germany	2 676
United Kingdom	2 500	Austria	407
Germany	2 400	Sweden	212
Sweden	1 926	Denmark	175
United States	1 580	Spain	151
Spain	1 449	United Kingdom	131
Australia	1 131	Italy	74
France	1 092	Norway	66
Italy	1 077	France	40

Source: ISO; EMAS.

of eco-labelling to the service sector. A recent feasibility study carried out at the European level resulted in guidelines for the introduction of an environmental quality label in the tourism sector, focused on tourist accommodation. Parallel to this study, ANPA realised a national study on the introduction of an eco-label in the Italian tourism sector that would define a group of products fulfilling both national environmental and sectoral requirements and indicate key criteria for widespread application.

A life cycle assessment database (I-LCA) is being developed as a collaborative effort of government, industry, universities and NGOs. It is intended to lead to a voluntary system of *Environmental Product Declaration* (EPD), providing consumers (professional or individual) with environmental guidance in choosing products. EPD has a purely informative character. It does not assess compliance with environmental standards. The EPD is to be certified (according to ISO 14025) by a third party (independent accredited body) that guarantees its credibility. Comparability among products or services is made possible through Product Specific Requirements (PSRs). Following an open consultation concluded in May 2001, PSR guidelines are being finalised.

Risk insurance

Few *insurance companies* cover civil liability or clean-up costs resulting from an industrial accident. Even companies that do so recognise a right to (full or contract) compensation only for soil pollution (if the insured company owns the land) and damage to areas in the immediate vicinity. They exclude harm to civil society and loss of amenities. Natural disasters (earthquakes, landslides, flooding) are totally excluded from home and industrial insurance coverage. Following severe hydro-geological incidents in 1998, the policy of state compensation in recent years has involved transfers from the central budget to the regions (EUR 612 000 in 1998-2000). Measures to reduce such transfers in the future should be explored, including reform of insurance policy and tighter land use policy to discourage building in disaster-prone areas.

2.7 Spatial planning

The most important law on land use planning remains Act 1150/1942, which defines three levels of planning (regional, local and project). This Act introduced the *city master plan*, which addresses both strategic development and land use. In this context each municipality defines its own implementation procedures. Ministerial Decree 1444/1968 makes it compulsory to preserve at least 9 m² of urban green space and 15 m² of rural protected area per inhabitant. Illegal construction (50 000 buildings per year, of which 75% in the South and on the islands) is often correlated with lack of city master plans.

There is no national land use plan, but *territorial plans* exist for provinces and regions. In 1972 primary competence for planning was assigned to the regions. Subsequently a number of laws have been enacted that impact on land use planning, such as the Galasso Act on landscape protection (431/1985), the Soil Conservation Act (183/1989) and the Framework Act on Protected Areas (394/1991). In 1996 MATT completed a national land use map (scale 1/100 000). The Ministry of Cultural and Natural Heritage will soon publish a list of areas suitable for landscape protection. The need for cultural and natural heritage conservation must result in the adoption of territorial plans (Legislative Decree 490/1999). Data being prepared on hydro-geological risk areas will be made available to central and local authorities responsible for soil protection. The 1989 Soil Conservation Act (included in Legislative Decree 180/1998) institutes river basin management. Ten years after the Act came into effect, almost all basin authorities have been established but little has happened in this area pending approval of river basin plans (Chapter 3, Section 2.3).

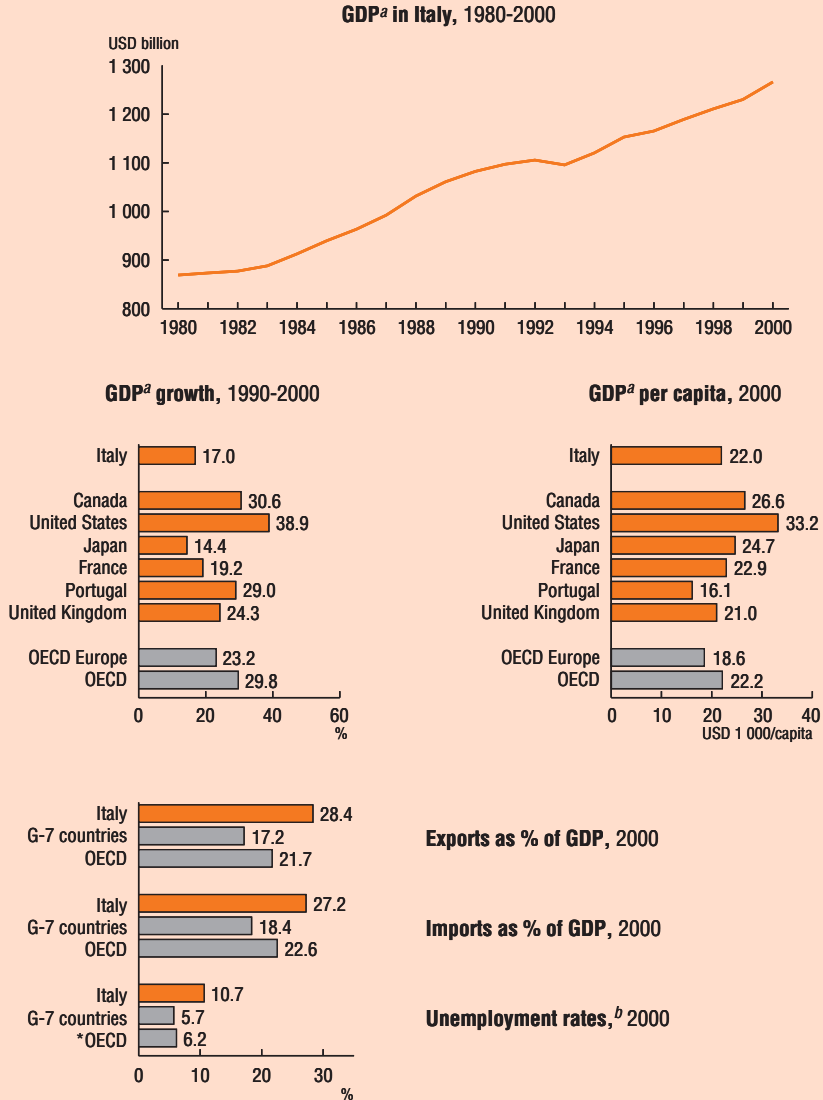
There is *no integrated legal approach to coastal zone management*. The Marine Pollution Control Act (979/1982) states that a coastal management plan must be elaborated and periodically revised to protect the marine environment. This plan is to address different activities in the coastal zone. The Galasso Act establishes a minimum distance from shore for any construction and forbids landscape alteration, including of dunes. River basin management must take account of the maritime littoral. The Ronchi Decree (22/1997) includes provisions for waste disposal in coastal and insular areas. The Marine Environment Act (426/1998) seeks to protect the undersea prairies of *Posidonia oceanica*, the basis of much of the Mediterranean's coastal ecosystem. Legislative Decree 152/99 sets out conditions for industrial and municipal waste water discharges in sensitive coastal waters and for nitrogen use in vulnerable coastal areas. Various authorities share competence for coastal zone management at the national, regional and local levels, and co-ordination has proved difficult. Many different authorities are responsible for monitoring the marine environment and for law enforcement, with the result that it is often impossible for them to do the job properly. Consequently, there has been an increase in unlicensed coastal construction. A firmer attitude on the part of competent authorities has been noted since 1999.

3. Focus on Selected Topics

3.1 Economic context

Italy has *one of the largest economies in the world*. It is a member of the G7. In 2000 per capita GDP was USD 22 000 (close to the OECD average) (Figure 6.1).

Figure 6.1 Economic structure and trends



a) GDP at 1995 prices and purchasing power parities.

b) % of total labour force.

Source: OECD.

GDP grew by 17% between 1990 and 2000, below the OECD average of nearly 30%. It grew by 1.8% in 2001, compared with 2.9% in 2000 and 1.6% in 1999.

During the first half of the 1990s Italy experienced economic difficulties: there was relatively high unemployment, along with high inflation and large budget deficits. Economic activity since mid-1999 has been driven by growing external demand, including that associated with the Stability and Growth Pact for South Eastern Europe. These factors, combined with *increasing labour market flexibility* resulting from new labour contract laws, have led to significant growth in employment. The unemployment rate fell from an average 11.4% in 1999 to 9.5% in 2001. Short-term interest rates are low; consumer price inflation is at 2.5%.

During the last decade the share of industry in GDP fell by 2.9%, reaching 30.5%. High added value industries and highly technological sectors such as machinery and electronics represent the largest share of manufacturing industries. Small and medium-sized industries have a relatively important economic role in view of their share of total industrial activity. The *share of services in GDP* increased by 3.5% to 66.9%. Tourism accounted for 12% of GDP and agriculture for 2.6%. Italy is highly dependent on imported energy (e.g. oil, gas, coal and electricity), which accounts for 8% of all imports.

Historically and until the early 1990s, much of industry was state-owned in Italy compared with other OECD countries. Since then, various initiatives have been taken to liberalise product markets and there are now only a few publicly owned enterprises. The pace of privatisation gained momentum in 1999 with the sale of one-third of the national electric power utility (ENEL). *Reform of the energy sector* (liberalisation and privatisation) was preceded by the establishment in 1995 of a regulatory authority for the electricity and gas sectors, which became operative in 1997. But there is still lack of competition in many sectors. The pace of liberalisation is slow in areas such as municipal public services, including water distribution, public transport and waste management. The most recent financial law, however, has opened to competition the management of these services.

Concerning *public finance*, meeting the Maastricht deficit target in 1997 (when the deficit was 2.7% of GDP) resulted from the most rigorous budget consolidations in the OECD area during the past decade. Italy reduced the general government deficit by eight percentage points in five years, mainly through tax increases but also by reducing transfers, subsidies and investment spending. In 1998 and 1999 the main objective was securing the gains made in 1997. Debt to GDP ratio has fallen since 1994, having reached a maximum 124% of GDP in 1994 (it was 109% in 2001 and remains the highest among OECD countries). Privatisation receipts (more than EUR 120 billion over the decade) have been devoted to public debt reduction.

In 1992 Italian macroeconomic policies shifted towards tighter fiscal discipline, privatisation and liberalisation, reflecting the transformations occurring in the European institutional framework and limiting the flow of public funds to the South. *Government revenue* in 2001 amounted to 46.1% of GDP. Local government collected only 8% of all taxes in 1992; in 2000 19.4% of revenue was raised locally. This change has led to a significantly higher share of fiscal autonomy for the regions and local governments, which are now less dependent on state transfers.

Besides responding to general on-going trends such as privatisation and regional development, the Italian economy is likely to be profoundly affected by *ageing of the population*. In 1996 only 16% of the population was 65 or older; in 2050 that figure is expected to be about 31%. This shift is likely to mean increases in the tax and social security burden. During the 1990s several reforms of the Italian pension system were initiated to address the increasing fiscal imbalance. The 1995 Dini reform introduced a contribution-based calculation method. The 1997 Prodi reform initiated harmonisation of public and private sector pension regimes.

3.2 Energy pricing

In Italy there is a pattern of *high taxation of energy sources* (particularly automotive fuels) and high prices for electricity use (boosted by taxes, but also driven by inefficiency and the market power of monopoly suppliers). One consequence of its taxation and pricing policies is that Italy's energy intensity is the lowest in the OECD. However, the overall relative contribution of taxes on energy products has been falling; in 1997 and 1998 they represented only 7% of revenue, significantly below levels reached during the late 1970s and early 1980s.

Encouraged by the fifth Community Action Programme, in 1998 Italy adopted a number of *new or revised environmentally related taxes*. These taxes were applied to a wide range of fuels, vehicles and air and road transport activity. A phased-in CO₂ tax on mineral fuels has been proposed. In view of the need to provide environmental incentives, there are some obvious anomalies in Italy's energy tax structures (as in those of other countries). Taxes on electricity use by industry are regressive; incentives to reduce use are therefore less effective. Many exemptions are granted (e.g. on heavy oil for heating purposes). There is a tendency to offer fuel duty rebates to the commercial transport sector and to support measures aiding "disadvantaged" regions. However, through favourable treatment of liquid fuels (especially those derived from natural gas) Italy's tax policies have had an important environmental bias. Natural gas used for electricity generation is not taxed.

Consequently, *Italy's energy tax system* (including the proposed carbon tax) has influenced the fuel mix, leading to relatively high use of natural gas, and has created a

general disincentive to energy use through raising prices. It also produces a relatively large share of overall tax revenues (compared with other OECD countries). Energy taxation should be reviewed with the aim of eliminating negative environmental externalities while identifying impacts on competitiveness of high energy prices, allowing for reductions in other taxes and any implications for disadvantaged groups.

3.3 *Development of national environmental institutions*

The *National Environmental Protection Agency (ANPA)* was established in 1994 to serve as the scientific arm of the Ministry of the Environment, taking over pollution prevention and control functions from the Local Health Units (ASL). Presidential Decree 335/97 structured the agency into five departments: state of the environment; pollution prevention and environmental clean-up; natural and technological risks; nuclear and radiological risks; and integrated strategies, promotion and communication. A 1998 Ministerial Decree extended ANPA's activities to include ex ante economic analysis of environmental projects, promotion of clean technologies and sustainable urban development. ANPA has recently been given new responsibilities for mapping hydro-geological risk, excluding that of earthquakes. It is expected that ANPA will take over responsibilities from the Department for National Technical Services (DSTN), formerly under the Presidency of the Council of Ministers. The DSTN's four services (geology, earthquakes, hydrography and oceanography, dams) carry out activities related to land protection, including studies and mapping of the physical environment and risk conditions, as well as impact assessment of plans and projects.

The *National Agency for New Technology, Energy and the Environment (ENEA)*, a public research centre, superseded the earlier agency for nuclear energy in 1991. In 1994 ENEA nuclear safety experts were transferred to the newly created ANPA. ENEA promotes renewable energy use through technological innovation, in close co-operation with SMEs. It also publishes environmental indicators and develops methods for territorial planning. Its environmental staff of 600 (out of 3 200) provides services to national, regional and local administrations.

Following liberalisation of electricity markets, the *Electricity and Gas Authority* was created by Act 481/1995 to monitor the correct functioning of markets and set price caps for gas and electricity. By law, tariffs must reconcile the economic objectives of bodies providing services with wider social and environmental objectives. From 2001, any import or production of electricity from non-renewable sources requires, in the following year, import or production of a quota from renewable sources (currently 2%). Renewable sources are given precedence by the separate entity managing the national distribution network (GRTN). Another entity, GME, manages the electricity market and power plant dispatching. The Electricity and Gas

Authority regulates technological innovation and the establishment of installations using renewable energy sources, energy demand and its compatibility with market principles, and permissible exposure to electromagnetic fields.

The *Central Institute for Scientific and Technological Research Applied to the Sea* (ICRAM) is a non-profit government agency that gives technical support to central and local authorities with respect to sustainable use of marine biological resources, including fishing and aquaculture activities. It also monitors and controls the quality of the marine environment, and draws up instructions for cleaning up marine and coastal waters in case of accidental marine pollution. The National Research Council (CNR), which dates to 1923, has a broad scientific and technological research mandate. Since 1991, CNR and ICRAM have jointly participated in the Research and Experiment Programme for the Adriatic Sea (PRISMA).

The *National Wildlife Institute* (INFS), created in 1933, received its current name in 1992. The task of INFS is to conduct a census of wild fauna, monitor changes and migrations, and propose measures to protect and restore threatened populations. Under supervision of the Ministry of Agricultural and Forestry Policy, the State Forest Corps (CFS) is a technical body entrusted with police powers for environmental protection. With its staff of 8 000, CFS can undertake other more general police functions on request from a Prefect. CFS activities cover civil protection, soil protection, management of protected areas, control of international trade in endangered species (CITES), control of hunting and fishing in fresh water, and control of smuggling in the areas of agri-food and forestry.

Over 60% of the Italian population lives in areas exposed to risks of earthquakes and volcano eruptions. The *National Institute for Geophysics and Volcanology* (INGV) carries out research and provides scientific advice in these areas, as well as taking part in civil protection activities in emergency situations. INGV results from the fusion in 1999 of various scientific institutes; it is under the competence of the Ministry of Education, Universities and Research. The National Institute of Health (ISS), supervised by the Ministry of Health, carries out research, control and training related to public health; it has a staff of around 1 400.

3.4 Devolution process

Since Italian unification in 1861, devolution has been a long process. Regional competence was embodied in the 1948 Constitution (Article 1171). *Five special status regions* were created between 1946 and 1963 (Friuli-Venezia Giulia, Trentino-Alto Adige, Valle d'Aosta, Sardinia, Sicily); Act 62/1953 granted ordinary statutory autonomy to the other 15 regions. Regional authorities were originally nominated by the Parliament. The first elections to regional councils in the 15 ordinary status

regions took place in 1970. Between 1972 and 1977, a number of administrative and state powers were progressively transferred to these regions and to local authorities. The Local Administration Reform Act (142/1990) confirmed the principle of local authorities' statutory autonomy, transferred new powers, and created metropolitan areas and mountain communities. Act 81/1993 introduced direct election of mayors and of provincial presidents.

Act 59/1997 (the *Bassanini Act*) accelerated the transfer of powers to ordinary status regions, communes and provinces and defined state powers. Act 127/1997 abolished a priori control over measures taken by local authorities. DLg 112/1998 implements administrative decentralisation. Constitutional Act 1/1999 provided for direct election of presidents of ordinary status regions and for their statutory autonomy. DLg 267/2000 unified legislation concerning local authorities. Constitutional Act 2/2001 extended direct election of regional presidents by direct universal suffrage (with the exception of Trentino-Alto Adige and Valle d' Aosta, which have kept the previous electoral system). Following a referendum on 7 October 2001, full legislative powers were given to regional governments, except in the areas of foreign policy, defence, immigration, justice and environment. The national government retains the power to regulate protection of the environment, the ecosystem and cultural heritage, but an amendment to Article 117 of the Constitution empowers regions to issue specific legislation to protect health and to manage land, in line with the national framework legislation. Moreover, regions have the exclusive power to issue legislation in any sector concerning the environment that is not explicitly mentioned in the Constitution. It appears that the division of legislative power is not yet clear.

The recent modification of the Constitution towards federation has expanded *regional competencies for environmental policy implementation*, taxation (the possibility to levy new taxes), education and enforcement (nomination of judges). Regions are directly responsible for regional land use planning and for establishing guidelines with respect to provincial plans and city master plans ("piano regolatore generale"). A region can establish more stringent environmental standards and requirements than those in effect at the national level. According to its own laws, together with the general principles of national legislation, it can define the role of local bodies in providing environmental services and prescribe rules for rational natural resource use. Provinces administer provincial and vast inter-municipal areas and host health services. Since 1990, the Local Administration Reform Act (142/1990) assigns general functions to provinces in the areas of soil protection, disaster prevention, water and energy resource use and protection, nature conservation, and waste management at provincial level. This Act gives provinces responsibility for permitting, inspection and analyses. They must also carry out monitoring of waste water discharges and of rational water use, waste management and air pollutant emissions.

Municipalities are responsible for providing the following environmental services: sewage treatment, drinking water supply, waste collection and disposal, and monitoring of air pollution. They regulate public sewage connections and discharges, industrial risks and noisy activities. Municipalities also authorise water abstraction and sewage discharges (permitting function). Mayors may adopt urgent measures to protect human health and ecosystem integrity. Mountain communities co-ordinate activities of the 3 025 municipalities in mountainous areas (65% of the territory, 32% of the population, 51% of municipalities, 50% of natural parks) through pluri-annual economic and social development planning. Provinces must approve such plans, which also establish environmental priorities. Funding comes from state and regional sources. Since 1994 the National Mountain Fund (financed from the central budget) is shared among regions and provinces; in turn, the regions and provinces finance regional mountain funds. Around 25% of total expenditure by the 368 mountain communities is on environmental protection and territorial planning, while most expenses are related to agriculture and state forest management. The Bassanini Act includes mountain communities among the entities to which the central government may transfer competence for territorial and environmental management.

3.5 *Towards more negotiated agreements*

A survey carried out between 1996 and 1998 indicated that there were 40 negotiated agreements in Italy: 16 national and 24 regional and local. Agreements have been signed between industry and MATT on *electricity production, refrigerators, motor vehicles and motorcycles*. To reduce CO₂ and NO_x emissions and increase energy efficiency, Edison has agreed to replace its three power plants with combined heat and power plants. Ausimont sponsors research on improving refrigerator insulation (following the ban on CFCs and progressive removal of HCFCs). Fiat signed two agreements in 1998 and 1999 to reduce CO₂ emissions from new vehicles by 20% (by 2005) and 25% (by 2010) based on 1990 values. Montedison has agreed to develop zero-emission transport technology and apply this technology to its own urban fleet. MATT will provide incentives for using electric motor vehicles. An agreement between MATT, MIT, the National Association of Italian Municipalities (ANCI) and the National Cycle, Motorcycle and Accessories Association (ANCMA) seeks to promote use of electric motorcycles and to anticipate production of motorcycles conforming to Euro1 emission standards.

Other agreements have been signed for *detergents, cameras, varnishes and hazardous substances*. More specifically, Ausimont is developing detergents with low environmental impact and low energy consumption for both industrial and household use. FederChimica-Assochimica, Soofotolabo and Ascofoto will set up a collection

and re-use system for single-use cameras, involving a deposit-refund scheme in which photo shops participate; in parallel, MATT will not include these cameras on the list of hazardous waste types. Ausimont will develop environmentally friendly varnishes (most solvents currently used are dispersed to air). Edison has agreed to develop new fire extinguishing systems in which halons will be replaced.

3.6 Achievements in the Friuli – Venezia Giulia region

Physical context

The 7 855 km² Friuli – Venezia Giulia (FVG) region is located in the extreme north-eastern corner of Italy, bordering Slovenia and Austria. The Livenza river which marks the boundary with the Veneto region, the Alps and the Adriatic. The *region's geography* is highly diverse, with mountainous areas and hills in the north (Carnia) and plains and coastal areas in the south. Coglians (2 780 m) and Jôf di Montasio (2 754 m) are the highest peaks. There are considerable climatic differences between the coastline inland mountainous areas. Average temperatures fall progressively from the sea towards the north. Annual precipitation increases to over 3 000 mm in the pre-alpine zone, decreasing to 1 500-1 600 mm annually in the Alps. With 3 346 mm per year, Mount Musi (635 m) in the Julian pre-Alps is considered the wettest place in Italy.

The FVG region has a *wide variety of ecosystems*, reflecting variations in climate. Indigenous species of mountain flora, such as *Lilium carniolicum* and *Wulfenia carinthiaca*, can be found. The Karst area also hosts many indigenous fauna and flora species. Another typical and almost unpolluted environment is that of the lagoons. The Marano and Grado lagoons, though separate from each other, form a fairly homogeneous stretch of water covering 16 000 hectares between the Isonzo and Tagliamento rivers. They attract large flocks of aquatic birds such as the mallard, garganey and coot. A 30 hectares marine park has been created at Miramare in the harbour of Trieste. On the high Friuli plain some “magredi” (poor untilled areas covered with thin grass) have been preserved from irrigation. Approximately 22% of the land is woodland, mainly in Carnia. There are large pine plantations along the coast.

Socio-economic context

Its ecological diversity is reflected in the region's socio-economic characteristics. The *population* (1.18 million) is unevenly distributed. Mountainous areas of the Friuli have a very low population density (106 inhabitants per km² in Udine), while density in the hilly areas and high plains of Venezia Giulia is above the national average (1 211 inhabitants per km² in Trieste, 296 in Gorizia). After World War II

precarious economic and social conditions in the mountain areas led to considerable migration abroad and, to a lesser extent, to more industrialised Italian regions. Migration ceased in the 1970s, when socio-economic conditions improved.

Income levels, measured as GDP per capita, are today above the national average though with regional variations (Chapter 7, Table 7.4). Venezia Giulia remains the richest part of the region, though the economy in the Friuli made a good recovery following an earthquake in 1976. Services are concentrated in the main urban centres, particularly Trieste (transport, insurance, shipping, banking and finance). Major investments have been made in connecting the region with Austria by rail and with Turin by road. Tourism has developed at a few well-known beach resorts. Industry is based on a network of small and medium-sized firms that are the backbone of the production system, while some large firms are leaders in their sectors. However, the major industries in Trieste area (naval shipyards and steel-making) have been affected by the crises in both sectors. Agriculture does not play an important role in the regional economy. Fishing is of some importance.

Environmental policy implementation

In 1963 the FVG region was given special status. This status was due to historical events on the eastern border (at the end of World War II the province of Pula, part of the provinces of Gorizia and Trieste, and part of the city of Gorizia itself were transferred to what was then Yugoslavia) as well as to the region's complex ethnic composition. A *regional environmental administration* was created in 1988; it currently has a staff of 90. The Regional Environmental Protection Agency (ARPA), created ten years later, now has four provincial departments. The general regional urban plan (PURG) of 1978 is still in force. It has not yet been replaced by a general regional territorial plan. Urban planning is subject to reservations by the regional government.

Environmental policy implementation developed during the 1990s. *Regional EIA legislation* was issued in 1990 and updated in 1996; it does not yet have provisions concerning SEA. A regional bill is being examined to transpose the Water Resource Act (Galli Act, 36/1994) and the Soil Conservation Act (183/1989). Four optimal management areas have been identified. DLg 265/2001 gave the region competence over waters previously in the public domain, with the exception of a few strategic stretches of river (e.g. on the border with the Veneto region). Pollutant emissions to air are controlled at about 3 000 plants licensed according to Presidential Decree 203/1988. The region has an integrated transport plan (PRTI). Regional Act 13/1998 transposed the Ronchi Decree on municipal, hazardous and packaging wastes (22/1997). A regional management plan was approved in 2001 through a Regional Presidential Decree. Concerning nature and landscape, the 1991 Framework Act on Protected Areas was put into effect through Regional Act 42/1996. Most public pasture and woodland is

regulated under landscape plans; almost 100 such plans are in force in the region, most with a 12-year horizon.

Support from the European Union

The European Union has taken an active part in developing the FVG region through co-financing the economic and social conversion of *industrial areas in decline* (objective 2 areas). These include 22 municipalities in Trieste, Gorizia and Udine provinces as well as sections of the cities of Trieste and Gorizia, representing 20% of the region's population. The Single Programming Document (SPD) for the FVG region set aside Structural Funds assistance of EUR 24 million in 1994-96 and EUR 39 million in 1997-99. The main objective was increasing competitiveness and attractiveness, particularly by improving inter-modal and road infrastructure and creating favourable conditions for industrial development. Some 14% of EU support has been for environmental protection.

As regards *rural areas* (objective 5b areas), the SPD for the FVG region co-financed EUR 44 million in 1994-99. Some 104 municipalities were eligible, representing 18% of the region's population. The aim was to diversify, redevelop and improve agricultural infrastructure and forestry resources, to make the region's ecological heritage a source of development for the population (soil conservation, reducing the environmental impact of stockbreeding), to support productive non-agricultural activities, and to develop tourism, including agri-tourism.

For the period 2000-06, Friuli – Venezia Giulia was included in the new objective 2 regions together with the 13 other northern and central Italian regions. The *regional programme* will mobilise EU funding of EUR 97 million, 13% of which is allocated to protection of environmental, natural and cultural resources. Eligible areas cover 60% of the region's territory and contain 24% of its population.

International environmental initiatives

Numerous *international environmental initiatives* have been taken in the FVG region. Co-operative monitoring of the Adriatic has reinforced relations with Croatia, Slovenia and the Veneto region. The region has developed inter-modal transport opportunities for goods moving in international trade. The port of Trieste has become a privileged point of access to the Central European market, along traffic routes to and from the Middle and Far East (via the Suez Canal). The Alpe-Adria highway and the Udine-Tarvisio-Vienna high-speed railway, both inaugurated in 2001, facilitate connections with Austria. In March 2001 Trieste hosted the G8 Environment Ministerial Meeting.

Bilateral environmental co-operation is well established with neighbouring Austria and Slovenia. Under INTERREG II, the European Commission approved a

programme to develop the *cross-border co-operation between Italy and Slovenia*, involving three provinces in the FVG region (Udine, Gorizia and Trieste) and the Veneto region. A key objective was improving the FVG region's local resources and environmental protection. This has involved promoting local products and tourism, expanding natural parks located on the border, creating a pilot centre for viticulture, and preserving water quality. Other objectives were to strengthen institutional and industrial co-operation and to develop communication networks. The EU contribution (nearly half of total expenditure) is financed mostly under the European Regional Development Fund (ERDF). EU assistance in 1997-99 was EUR 16 million, 46% of which was allocated to environmental protection. Under INTERREG III (2000-06), the total EU contribution rose to EUR 56 million.

Another INTERREG II programme seeks to develop *cross-border co-operation between Italy and Austria*, involving the FVG and Veneto regions and the autonomous province of Bolzano. Eligible areas are mainly mountainous (in the ecologically sensitive Alps) and include an Italian population of 1.3 million. The main objectives have been to develop the economy on both sides of the border and to promote bilateral co-operation. The programme has sought to exploit the common historical and cultural heritage of the border regions in order to enhance co-operation on environmental protection, develop co-operation in agriculture and forestry, promote tourism and create favourable conditions for development of SMEs. EU assistance was EUR 12 million in 1997-99, of which 18% for environmental protection. Under INTERREG III, the EU contribution rose to EUR 34 million. One-third of this amount will be used to finance environmental protection through developing protected areas, managing energy efficiently and setting up institutional networks.

The FVG region is participating in *Central, Adriatic, Danubian and South-East European Space* (CADSES) programmes. In 1997-99, as part of an INTERREG II initiative to develop joint actions by Italy, Austria, Germany and Greece, the EU contributed EUR 21 million to create urban networks, develop transport networks that respect the environment, improve access to information, and co-operate in managing the cultural and natural heritage. Under INTERREG III, the EU contribution rose to EUR 132 million. Joint actions have also been developed between Italy, Austria, France and Germany as part of the Alpine Space programme. This has involved the mountain communities of Carnia. Under INTERREG III, the EU allocated EUR 59 million to this programme.

Transport-environment integration

Transport is a *crucial sector* for the region's socio-economic development, and effective integration of environmental and transport decisions is one of the main challenges for the years ahead. The region is developing its role as a platform for

international freight movement, taking advantage of its position at the intersection of north-south and east-west transport routes. It benefits from a relatively good transport network, and has an international airport and one of the country's largest ports in terms of total freight movement. As it has little direct influence on decisions concerning long-distance traffic and networks, the region works closely with national authorities and has established co-operation with Slovenia to improve its connection to the Slovenian transport network and beyond to Hungary.

Transport planning follows the objectives of the national PGT. The region's *plan for integrated transport* (PRTI), which serves as a framework document for urban mobility plans and urban traffic plans (PUT), is complemented by more detailed second-tier plans. Co-ordination with other regional plans, such as the regional air quality plan currently under development, is ensured. FVG is among the first regions in Italy to have implemented the reform of local public transport. Environmentally friendly public transport modes are promoted through the regional plan for local public transport (LPT), adopted in 1997, and through urban initiatives. The city of Udine, among the first in Italy to experiment with the use of methane-powered buses in the 1980s, today ranks first in this area with 68% of its urban transport fleet so equipped. EIAs are systematically carried out for all infrastructure projects of regional importance, and the region co-operates with national authorities on other projects. Additional measures include development of urban sustainable mobility systems, co-funded by MATT, and promotion of inter-modal freight transport. The port of Trieste has established an agreement with the national railway company (FS); directly connected to the national rail network, it is Italy's first rail port. Trieste also co-operates with the ports of Monfalcone, Fiume and Capodistria on creation of a hub for freight movements in the upper Adriatic that can compete with northern European ports, including integrated logistics platforms and interportual hubs handling road and rail transit.

Road fuel prices are among the lowest in Italy. Since 1997, residents of the FVG region have been granted price reductions on petrol to minimise their purchases across the border in Slovenia, where fuel prices are much lower. These reductions, ranging from EUR 0.222 to EUR 0.124 per litre, vary according to distance from the border. This affects the impact of measures concerned with public transport and the modal split in passenger transport. In Udine car ownership is among the highest in Italy (81 cars per hundred persons) and use of public transport remains low. Road transport also remains prevalent in the case of land-based freight movements; the region faces increasing road traffic flows, with related effects on traffic congestion and on urban air quality (PM₁₀, benzene, PAHs). Further development of transport infrastructure raises questions about implications for the region's natural areas and protected sites, and will require careful consideration of both socio-economic and environmental objectives.

7

ENVIRONMENTAL-SOCIAL INTERFACE*

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the Environmental Performance Review of Italy:

- reinforce efforts to reduce *regional disparities in access to environmental services* through development programmes (e.g. environmental infrastructure) in the South;
- further promote *capacity building* (e.g. EU Structural Funds task-force) in project and financial management, and in implementation of the Environmental Strategy for Sustainable Development, at both regional and local levels;
- promote the creation of *environmentally related jobs* (e.g. at local level, in organic farming, in small enterprises);
- review the lessons to be learned from *urban development programmes* carried out so far, and build on positive experiences in future urban revival and Local Agenda 21 projects;
- improve land use planning and building permitting through full use of information concerning exposure to *natural disasters and industrial risks*;
- strengthen *environmental information systems* through extended and improved monitoring, economic coverage (e.g. concerning environmental expenditure) and integration of information from various sources;
- further inform the public about its rights to environmental information, facilitate public *access to environmental information*, and encourage *public participation in decision-making*.

* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental Performance Review of 1994. It also reviews progress with respect to the objective “social and environmental interface” of the 2001 OECD Environmental Strategy.

Conclusions

Italy has made progress on *environmental information*, access to this information and public participation. Environmental reporting is well established at the national level (e.g. state of the environment *reports*, environmental *statistics*) and a *National Environmental Information and Monitoring System* (SINAnet) has been established. Italy proceeded with early ratification of the *Aarhus Convention*. The right of access to environmental information is laid down by law and is enforceable in the courts. Financial and technical support by MATT has had positive effects on *Local Agenda 21* implementation: over 500 local bodies are now involved, enhancing public participation. Capacity building of regional environmental administration has received support from EU Structural Funds, especially in the South (e.g. task-force of 150 experts to support regional environmental authorities and ARPAs). *Environmental education* has benefited from devolution of powers to the regions, as well as from technical and financial support provided by the national government (INFEA) and EU Structural Funds, especially in the South. Following several *natural disasters*, efforts have been made to assess the risk of such events (e.g. flooding, landslides, seismic and volcanic activity) occurring throughout Italy. *Urban revival* programmes have been implemented (Urban-Italy and national initiatives), leading to better quality of life in the urban environment. Rural development, including organic farming and farm tourism, provides a range of social and environmental benefits. Public awareness of the potential health effects of *electromagnetic radiation* (e.g. from powerful radio transmissions and high-voltage electric transmission lines) has attracted increased attention from scientists and other decision-makers; precautionary measures (e.g. more stringent standards) have been introduced.

Strong disparities still exist, however, especially between the North and South, in terms of access to environmental services (especially water). Despite successful urban revival programmes, the capacity to draw up, carry out and account for development programmes at the regional and local levels has generally been limited, especially in the South. Concerning *environmental information*, monitoring systems should be reviewed for relevance and consistency: availability of environmentally relevant economic information is weak; integration of regional data at national level suffers from insufficient harmonisation and problems with data flows; citizens are often unaware of their *right to environmental information*. Efforts to develop environmental awareness and public participation are uneven across the country. These efforts are particularly limited in less developed regions. Too little has been done to explore local creation of *environmentally related jobs*.

1. Evaluation of Performance

According to the *2002 national report on sustainable development* prepared for the Johannesburg summit on sustainable development, Italy's main social challenges are:

- the high *unemployment* level (constantly over 10% during the last decade);
- *female employment* and integration (into the working life);
- increased *foreign immigration* (from non-EU countries);
- the declining birth rate and *ageing population*;
- reviewing the main issues related to social security, pensions and other *social programmes* through the use of market-based instruments.

The proposed *Environmental Strategy for Sustainable Development*, published by the Ministry of the Environment and Land Protection (MATT), touches on several key issues concerning environmental-social integration. These include integration of environmental concerns in sectoral policies and public participation. However, the Strategy's main emphasis is on environmental quality and the quality of life in urban environments.

To strengthen the environmental and social interface, the *1994 OECD Environmental Performance Review* (EPR) recommended that Italy:

- continue to develop a complete and reliable system of information on the state of the environment and on related economic issues (expenditures, employment, sustainable development, consumption and production patterns);
- develop public participation and public access to environmental information and data; in particular, public enquiries should be extended to all projects submitted to environmental impact assessment.

1.1 Environmental employment

While the *unemployment rate* has fallen in recent years, it is still relatively high (9.5% in 2001) and remains a major economic and social issue (Chapter 7, Section 2.1). Official figures tend to underestimate the economic effects of the shadow economy and illegal workers, often untrained or immigrants from non-EU countries. Youth unemployment also remains high (32% of young women and 25% of young men) and there are significant regional disparities (51% in southern Italy, compared with 15% in the North).

Positive direct *employment effects of environmental policies* have been generated in the public and private sectors. The number of people employed by Italian eco-industries in 1994 was estimated at 101 600 (i.e. 9.7% of total employment in EU

eco-industries). Trade unions see great potential for new job creation in environmental services. No analysis has been made of the skills required for environmentally related jobs. During the 1990s there was a 46% increase in the number of enterprises registered in the eco-industry sector; in the late 1990s this increase largely concerned solar and other alternative energy sources water purification and treatment, waste disposal and treatment, monitoring and control, advice and environmental services. Recent growth in the number and size of enterprises in the eco-industry sector is mainly owing to development of environmental investment; about 30 000 new jobs were created in 1999.

Local initiatives to create environmentally related jobs began only recently in Italy. Such initiatives, encouraged by the EU and Local Agenda 21 implementation efforts, involve a wide range of stakeholders. As part of local sustainable development strategies, these partnerships attempt to integrate the economic, environmental and social aspects of sustainability.

To implement the *Framework Act on Protected Areas* (394/1991), integrated management measures have been taken to ensure ecosystem protection and management and sustainable socio-economic development with positive environmental impacts. Especially in Sardinia and Sicily, and in the mountain regions, the revival of traditional farming, organic farming and farm tourism have created jobs and contributed to keeping these rural areas viable. There are almost 50 000 organic farms; over 1 million hectares (7% of agricultural land) is cultivated organically. Local populations have been involved in creating workplaces for artisans, in farm tourism, and in surveying and managing protected areas (where traditional or organic farming may be encouraged). At least 2 300 people have benefited more or less permanently from this type of employment and entrepreneurship.

The fishery industry is in difficulty for a number of reasons: depletion of fish resources, poor fisheries management, an outdated fishing fleet, and EU policies concerning reduction of fishing and limitations on the use of fishing equipment such as drift nets (Chapter 9). Italy needs to reinforce its efforts to address the *social implications of policies for fisheries management*. Unemployment in this industry calls for cost-efficient solutions (e.g. re-education, pension schemes for older people who have lost their jobs or risk losing them). Two programmes have been established to tackle these problems in 2000-06. They are co-financed by national funding and the EU Structural Funds, for a total of EUR 327 million.

1.2 Environment and health

The 1993 *environment and health programme* focuses on populations exposed to pollution exceeding legal or recommended levels. It also reviews relevant national

legislation and includes an epidemiological study of areas “at high risk of environmental crisis”. A subsequent programme deals with air pollution and public health in the eight largest cities (Bologna, Florence, Genoa, Milan, Naples, Palermo, Rome and Turin), with assessments of related economic impacts. It also addresses public health in areas at high risk of environmental crisis, including analysis of relevant environmental and socio-economic factors, as well as urban environmental/health indicators. Partly in response to the high level of public concern, considerable attention has been given to the potential health risks of electromagnetic radiation (Chapter 7, Section 2.2).

In Italy cancer and cardiovascular disease are the *most frequent human health problems*. Breast cancer is the most common cause of death among women and lung cancer the most common among men. Incidence of lung cancer in both sexes is higher in urban areas than in rural ones, showing a rising gradient from South to North. Italian studies (like those in other countries) indicate that smoking, indoor risk factors (e.g. radon and asbestos) and atmospheric pollution are the main causes of respiratory disease. Urban traffic has multiple impacts, including respiratory disease, noise related stress, and death and injuries from accidents (Chapter 8). About 90% of people in large cities live in areas exposed to noise above the acceptable threshold level (55dBA in daytime). In 2002 WHO published a report on environment and health in industrialised and densely populated areas of Italy; serious risks were detected.

In the 1990s *occupational health accidents and disease* decreased markedly (e.g. by one-half for occupational diseases). The National Institute for Occupational Health (INAIL) has conducted risk assessments and improved awareness of environmentally related health risks among workers. According to INAIL, dust, free silica and asbestos present important health risks at factories and workplaces where there is heavy traffic. INAIL classifies occupational health charges according to health risks: the higher the risk, the higher the charge. INAIL may give financial support to enterprises to establish or improve occupational health monitoring, replace obsolete technologies with more environment- and worker- friendly ones, or improve environmental safety and health management systems.

1.3 Environmental disparities: poverty and access to environmental services

Poverty

In Italy over 12% of families are poor. Poverty is mostly concentrated in the southern regions (61% of all poor families), particularly in the main urban areas. The number of families that live in relative poverty has been increasing, to

2.6 million (or 7.5 million people) (Tables 7.1 and 7.2). In the late 1990s poverty incidence appears to have been reduced in the southern regions and to have grown in the central ones. Direct support to households is limited and unevenly allocated compared with that in most other European OECD countries. Italy (with Greece) is the only EU country that does not have a national protection system for the poor. According to the 2001 OECD Territorial Review of Italy, the poorest one-fifth of the population receives the lowest social programme transfers (compared with the other four-fifths).

Table 7.1 Poverty incidence^a
(%)

	1997	1998	1999
North	6.0	5.7	5.0
Centre	6.0	7.5	8.8
South	24.2	23.1	23.9
Italy (total)	12.0	11.8	11.9

a) Ratio between poor families and total number of families.
Source: ISTAT.

Table 7.2 Poverty intensity^a
(%)

	1997	1998	1999
North	18.6	18.9	19.2
Centre	18.5	19.1	19.5
South	22.9	24.2	24.7
Italy (total)	21.5	22.4	22.9

a) Average difference between the consumption expenditure of poor families and the national consumption expenditure (poverty threshold) expressed as a percentage.
Source: ISTAT.

The two major categories of *social security* administered at the central level by the National Social Insurance Institute (INPS) are unemployment benefits and old age pensions. Unemployment benefits provide restricted coverage over a limited period. Nearly half of social security expenditure goes to pension payments. Over 60% of retirement pension payments go to people living in the North, where higher employment rates have made it easier to reach a level entitling them to these payments. Only 17% of payments go to people living in the South. Disability pension payments are highly concentrated in the Mezzogiorno, where they tend to support older shadow economy workers who are not entitled to a retirement pension.

Access to environmental services and environmental quality

The 1990 Framework Law (142/90) reforming local administration reaffirmed the constitutional requirement that a standard level of service should be guaranteed to all citizens. A decade later there are *still major differences in access to environmental services and housing*. There are considerable disparities in most municipal environmental services between the North and South, including adequate safe drinking water supply (Table 7.3), sewage collection and treatment, waste management, and acceptable and affordable housing (Table 7.4). In north-eastern Italy 6.7% of households report problems with tap water supply, while this figure is much higher in the

Table 7.3 **Drinking water availability, 1996**
(% of population)

	Sufficient water	Insufficient water	
		3 months/year	6 months or more/year
North-west	91.0	6.6	2.4
North-east	92.0	4.8	3.0
Centre	79.9	12.0	8.1
South	22.2	25.3	52.5
Islands	45.2	11.8	43.0
Italy (total)	66.5	12.5	21.0

Source: WHO.

Table 7.4 Regional data, late 1990s

Region	Land area (% of total)	Population density		Regional GDP/inh. (% of national GDP/inh.)	Surface of protected areas (state & regional) (% of total)	Urban waste (000 t/year)	Separate urban waste collection (%)	Hazardous waste (000 t/year)	Municipal waste water treatment pers./eq. (%)	Families exposed to water supply irregularities (%)	Population/ car
		(% of total)	(inh./km ²)								
		1998	1998								
Piedmont	8.5	7.4	169	116.1	7.7	2 007	15.0	388	6 800	9.4	1.63
Valle d'Aosta	1.1	0.2	37	136.3	12.6	63	12.3	7	100	8.1	0.94
Lombardy	7.9	15.7	378	132.2	21.3	4 280	33.3	1 237	9 500	8.2	1.72
Trentino – Alto Adige	4.5	1.6	68	134.4	20.9	508	19.1	36	1 500	3.9	1.88
Veneto	6.1	7.8	244	117.3	5.1	2 113	23.9	384	11 300	7.5	1.73
Friuli – Venezia Giulia	2.6	2.1	151	113.8	6.8	572	16.1	108	2 400	3.4	1.69
Liguria	1.8	2.8	301	106.2	11.0	899	9.5	168	2 400	7.4	1.98
Emilia – Romagna	7.4	6.9	179	128.0	5.7	2 414	19.1	430	3 800	7.6	1.63
North	39.9	44.5	213	123.8	11.3	12 855	23.1	2 757	37 800		1.70
Tuscany	7.6	6.1	153	109.3	6.5	2 106	16.8	223	6 800	14.0	1.66
Umbria	2.8	1.4	98	95.3	7.0	422	10.1	18	700	14.6	1.58
Marche	3.2	2.5	150	100.3	8.9	761	7.4	34	1 200	12.5	1.66
Lazio	5.7	9.1	118	109.8	10.5	2 780	3.4	153	5 100	12.3	1.58
Centre	19.3	19.1	189	107.3	8.2	6 068	9.0	428	13 800		1.62
Abruzzo	3.6	2.2	118	84.0	28.0	609	4.3	40	1 900	20.2	1.81
Molise	1.5	0.6	74	63.4	1.4	114	2.0	23	300	24.2	2.06
Campania	4.5	10.1	426	63.5	24.9	2 562	1.1	65	3 500	18.7	1.93
Puglia	6.4	7.1	211	65.2	6.7	1 803	3.7	66	4 700	14.7	2.12
Basilicata	3.3	1.1	61	70.8	12.2	219	2.3	8	500	17.3	2.14
Calabria	5.0	3.6	137	60.8	13.1	821	0.7	160	1 900	45.2	2.10
Sicily	8.5	8.8	198	66.0	8.8	2 553	1.9	100	2 600	29.7	1.90
Sardinia	8.0	2.9	69	75.9	0.5	760	1.3	411	3 000	21.8	1.96
South	40.8	36.4	170	66.6	10.8	9 440	2.0	872	18 400		1.97
Italy (total)	100.0	100.0	191	100.0	10.5	47 288	13.1	4 058	121 600	14.0	1.77

Source: ISTAT; MEF; ACI; OECD.

Mezzogiorno (21.6% in the South and 27.8% on the islands). In the North roughly 70% of households have separate collection of paper and cardboard waste, compared with 18% in the South and 11% on the islands. Local air pollution is a major environmental concern in over 50% of households in northern and central Italy and by a somewhat smaller percentage in the Mezzogiorno (Table 7.5).

While the ratio of dwellings to families has been above 1.2 since the end of the 1980s, hardship related to housing persists (especially in urban areas). Italy's *housing policy* favours private ownership. Nearly 80% of families own their homes. However, the conditions in which tenants belonging to low income groups live remain critical: housing expenditure reaches 25% or more of their revenue, and dwellings are often located in degraded urban areas with poor environmental quality. The poor generally occupy illegal housing on old and polluted industrial sites or sites exposed to hydro-geological risks (e.g. from flooding, landslides and earthquakes).

Achieving *social and environmental equity* with respect to access to environmental services and safe products will be a challenge for Italy.

Table 7.5 **Main environmental concerns of the population, 1998^a**
(% of population over 14 years of age)

	North-west	North-east	Centre	South	Islands	Italy (total)
GHG emissions	55.2	57.4	59.1	59.6	60.0	57.9
Air pollution	54.3	50.9	52.8	47.4	46.4	50.8
Water pollution	43.9	42.5	41.9	35.3	34.4	40.1
Waste	43.3	39.3	38.3	38.8	33.6	39.4
Climate change	32.6	38.4	35.6	36.4	40.0	36.0
Hydro-geological disasters	33.5	33.5	35.2	35.3	30.9	34.0
Forest destruction	25.3	27.1	26.0	21.8	28.1	25.2
Soil pollution	20.0	20.9	22.6	18.8	19.4	20.3
Extinction of fauna/flora species	17.6	15.0	16.4	15.3	14.5	16.0
Landscape protection	19.1	17.7	14.4	12.8	13.3	15.8
Natural resource depletion	15.5	15.9	14.9	12.8	16.7	15.0
Noise	16.7	11.2	13.2	15.2	14.4	14.4
Electromagnetic radiation	9.9	11.1	10.8	9.0	7.9	9.9

a) The public opinion survey was carried out before electromagnetic radiation or food safety (e.g. BSE) had become real issues for public debate.

Source: ISTAT.

1.4 Environmental disparities: hydro-geological risks and urban revival

Hydro-geological risks and soil degradation

Following several tragedies (particularly the 1998 Sarno/Campania landslide), *high priority has been given to natural hazards* (flooding, landslides, earthquakes, volcanic eruptions). The first national map of hydro-geological risk areas has been drawn up, classifying 2 200 municipalities (27% of all Italian municipalities) as having areas of very high hydro-geological risk. Some 9 200 areas are at high risk of flooding and landslides. Over 15% of the territory and 26% of the population are subject to very high hydro-geological risk. Since a majority of the population lives in areas where earthquakes and volcanic eruptions may occur, the risk survey has been extended to cover exposure to these types of emergencies as well as major industrial accidents. The Porto Marghera industrial complex (Venice lagoon) remains the single most high-risk industrial area. As land use planning and permitting by local authorities do not always integrate such concerns and information, new housing and infrastructure continue to be planned and built in vulnerable areas without proper risk assessment.

Case studies have demonstrated a connection between flooding and landslides and *soil degradation* resulting from human activity. Destruction of vegetation, clear-cutting of forests and hydraulic engineering may be responsible for soil degradation, soil erosion or increased risks of flooding and landslides. Recent studies suggest an increase in very heavy rain due to climate change, adding to the risks of flooding, landslides and erosion. Fires, which frequently occur in Mediterranean forests during droughts, are also related to soil erosion. A 1999 National Action Programme to prevent soil degradation was approved by the government. In 2000 a National Action Plan to combat desertification was launched. A National Observatory on Desertification has been established in Sardinia. A Study Centre for traditional knowledge that could be used to combat desertification was established in 1998.

Urban revival

Italy has a very important *historical patrimony*. Countless churches, palaces and piazzas in urban areas are part of the national and world cultural heritage. An inventory of urban green space indicates great variations among cities (Table 7.6).

Local authorities have responded well to the European Urban Programme aimed at reviving disadvantaged urban areas. The first *Urban-Italy programme* (1994-99) was co-financed by EU Structural Funds (EUR 890 million) and state, regional and municipal sources (EUR 1 285 million). In Italy 16 cities with degraded urban areas, including inadequate services and infrastructure, participate in this programme.

Contratti di Quartiere, an urban revival programme promoted by the Ministry of Infrastructure and Transport (MIT), corresponds to the Urban-Italy programme. Areas “in a state of crisis” must address a number of social problems such as lack of infrastructure and public services, housing in disrepair, unemployment and crime (including juvenile crime). Efforts to revive these areas may involve support to existing local small and medium-sized enterprises (SMEs) and promotion of new ones, efforts to increase local employment, adjustment and optimisation of social services, improvement of infrastructure and the environment, and greater public involvement and participation at the local level. In particular, urban projects have been initiated in historic city centres, neighbourhoods in declining industrial areas (e.g. at Genoa and Venice) and isolated, under-equipped peripheral suburbs (e.g. at

Table 7.6 **Urban green space, 1998**
(m² per inhabitant)

	Equipped green	Urban Parks	Historical green	Street furniture areas	Special areas	Total	Green space in the commune (%)
Turin	3.3	5.4	0.5	0.8	3.3	13.3	10.1
Aosta	1.3	3.3	0	3.4	0	7.9	1.3
Milan	1.8	3.1	0.8	2.0	1.4	9.1	6.7
Bolzano	7.7	0	0	1.2	8.4	17.3	3.5
Trento	6.8	3.0	0.8	4.0	5.7	20.4	1.4
Venice	6.4	1.6	0.1	0.5	2.9	11.5	0.8
Trieste	0.5	7.8	0.5	0.2	1.2	10.3	3.0
Genoa	0.8	18.7	1.4	0.5	0.2	21.5	5.9
Bologna	9.3	9.7	0	3.4	6.5	28.9	8.1
Florence	4.3	1.6	2.3	0.3	4.8	13.2	5.0
Perugia	5.5	18.8	0.4	8.8	2.9	36.4	1.3
Ancona	8.3	13.6	3.3	..	0	25.3	2.3
Rome	2.2	6.2	2.1	1.3	0.3	12.1	2.7
L'Aquila	3.8	1.4	0	1.1	0.3	6.7	0.1
Campobasso	0.6	3.1	0.5	0.3	0.6	5.1	0.5
Naples	0.2	0.5	0.1	0.4	0.8	2.1	1.8
Bari	1.3	0	0.4	0.8	0.4	2.8	0.8
Potenza	0.3	6.6	0.3	0.2	2.8	10.2	0.4
Catanzaro	0.1	41.8	0.3	0	8.8	51.0	4.5
Palermo	0.6	14.6	0.4	0.3	0.9	16.8	7.3
Catania	0.1	1.8	0.2	1.2	0.5	3.8	0.7
Cagliari	3.1	2.3	1.2	3.3	11.7	21.5	4.3

Source: ISTAT.

Rome, Cagliari and Reggio Calabria). Urban revival programmes would benefit from comprehensive assessment of lessons learned and from efficient use (and control of use) of public funds. Overall, 13% of the population (some 7.5 million people) has benefited from urban revival programmes. The second *European Urban Programme* (2000-06) covers not more than eight critical urban environments in Italy, with a contribution from EU Structural Funds of EUR 108 million.

1.5 Environmental awareness and education

Environmental NGOs

The *range and influence of environmental NGOs* in Italy is impressive. They have an important role in promoting environmental awareness, education, training and public participation. Environmental authorities often consult NGOs as civil society representatives. They provide expertise on a number of environmental issues (e.g. drafting strategies, programmes and new legislation). The most important environmental NGO, Legambiente, produces an annual state of the environment report and an environmental indicators report commissioned by MATT. Other environmental NGOs include Amici della Terra (the Italian branch of Friends of the Earth), Federazione Nazionale pro Natura, Greenpeace Italia and WWF Italia. Many scientific societies, including the Società Geografica Italiana, are also influential NGOs. Environmental NGOs fulfilling certain criteria may be recognised by MATT and receive financial support for specified activities.

Public opinion and the environment

According to a *countrywide survey on Citizens and the Environment* by the National Statistical Institute (ISTAT) in 1998, environmental concerns in general were ranked seventh after unemployment, crime/violence, immigration, the health care system, tax evasion and poverty. Environmental protection was the priority national concern of 16.8% of respondents.

According to a 1999 *EU survey* (Eurobarometer), the number of Italians who felt they knew enough about what to do in their daily lives to contribute to environmental protection was below the European average. Respondents ranked local environmental problems mentioned by the survey in the following (descending) order of importance: air pollution, traffic, waste disposal, bathing water quality, civil defence preparedness to respond to disasters, damage to the landscape, tap water quality, lack of green space, noise, and quality of food products. To improve public awareness, codes of good environmental practice could be developed and disseminated to the general public.

Environmental education

The current *environmental information, training and education programme* (INFEA) succeeds two earlier programmes (1989-91 and 1994-96) with similar objectives. Its purpose is to integrate actors in the environmental field, local and global initiatives, and commitments by citizens and administrations. This programme is maintained by MATT, which may also give financial support to related initiatives, private or public, at any level from primary schools to universities and workplaces. INFEA funds have encouraged regional governments to create some 100 centres and laboratories concerned with environmental information, training and education. In southern Italy (including the islands) additional financial support for environmental information, training and education has been provided by EU Structural Funds (the Multi-regional Environment Operative Programme, POMA), resulting in the creation of an additional 30 regional environmental education centres. As part of INFEA, the national archive of documentation and research for environmental education (ANDREA) gathers information on activities carried out by different actors (e.g. local administrations, NGOs, schools, universities, research institutions) to improve environmental information. ANDREA is one of the concrete results of a co-operative agreement between MATT and the Ministry of Education, Universities and Research.

In addition to specific environmental actions in schools and environmental courses in universities, efforts have been made to integrate environmental education in the curricula of several of the superior studies. Environmental issues are also included in the training curricula at many workplaces. The *national database on environmental education and training* (ANFORA) collects information about environmental education initiatives taken by the regional government, other public administrations, schools, universities and private entities. ANFORA offers an updated list of courses on environmental information, training and education. In recent years some 2 000 educational and training activities have been registered in its database. In 1999 almost 57% of environmental courses at the intermediate level took place in northern Italy and only 16% in the Mezzogiorno. Popular courses included sustainable agriculture and tourism, management of public green space, environmental safety, environmental certification of products and processes, bio-architecture, ecological construction, and restoration of historical urban environments.

1.6 Environmental democracy: information and public participation

Environmental reporting

During the last ten years institutional progress has been made on environmental information and monitoring with the establishment of the National Environmental

Protection Agency (ANPA) and the *National Environmental Information and Monitoring System* (SINANet). SINANet manages and co-ordinates environmental information and monitoring activities at national and sub-national levels through a network of national topic centres, regional focal points and national reference institutions, including Regional Environmental Protection Agencies (ARPAs), Provincial Environmental Protection Agencies (APPAs) and ISTAT. Information flow among the main national administrations that deal with environmental information (MATT, ANPA and ISTAT) is well organised.

Reporting activities are well established at national level. Since 1986 *state of the environment reports* have been required by law and are presented to the Parliament. They have been published regularly by MATT; the 2001 report is available free of charge on the Ministry's web site. The Junior Report on the State of the Environment (for children) was published recently (in 2002). Environmental statistics are published regularly by ISTAT. A report on environmental data is available (ANPA), but a report on environmental indicators has not yet been published. There are plans to publish this report annually as an annex to the government's budget bill. MATT produces a monthly information bulletin, "L'ambiente informa". Legambiente's annual report on the state of the environment is well documented. Progress has been made on waste management reporting (2001 report by ANPA, the National Observatory on Waste) and greenhouse gas and air emission inventories (reports to the UN Framework Convention on Climate Change and the Convention on Long-range Transboundary Air Pollution). Much progress has also been made at sub-national level; many regions, provinces and municipalities (e.g. the Veneto and Friuli – Venezia Giulia regions, the city of Rome) disseminate state of the environment reports. MATT funds support for implementation of Local Agenda 21s and will further stimulate local reporting.

Despite these achievements, there are *a number of inefficiencies*. Environmental monitoring is not consistent and up to date in all areas. There are weaknesses in data quality and availability, as well as a lack of data on particulate emissions (to air), waste water discharges and the state of coastal waters. Information is unavailable on environmental expenditure data and other environmentally related economic information (e.g. environmentally related taxes, subsidies, prices). This gap was highlighted in the 1994 OECD Environmental Performance Review. A first set of environmental expenditure data was produced by ISTAT for 1996. Current efforts focus on harmonising Italian data with OECD and Eurostat definitions. Integration of regional data into meaningful national level statistics is problematic since there is inadequate co-ordination of collection methods, data characteristics and data flows at local, regional and national levels. Similar difficulties are encountered when data from various national sources, including non-environmental administrations, need to be integrated; there are long delays in producing data and the data released lack timeliness.

Access to environmental information

The right of access to environmental information is embodied in national law and recognised as enforceable in the courts. The legal framework is provided by DLg 39/97, the 1990 EU directive on public access to environmental information, and the *Aarhus Convention* on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters. Italy was the second OECD country (after Denmark) to ratify the Aarhus Convention. All public authorities and semi-public bodies holding environmentally related information must provide this information to MATT and to the public on request; the response delay is 30 days. Information will be made available without an interest having to be stated at the time of request. The only cost to requesters is that of the materials.

Access can be denied for reasons of commercial or industrial confidentiality, national security, and the confidentiality of certain public decisions. Examples of information that cannot be accessed at company level include raw data on pollutant emission measurements and natural resource use (which must be aggregated before release) and reports of public enquiries held as part of licensing procedures for hazardous installations. Some environmental information (e.g. environmental impact assessment of power stations) is available to the public during a limited time period.

Very little information is available on the *actual implementation of these legal provisions*, the type and origin of requests received, difficulties encountered, or the number of complaints regarding refusal to comply with requests. While Italy is pursuing an active policy with respect to publication and dissemination of major environmental reports, its policy on access to information is not fully operational. At national level public access to environmental information held by environmental administrations is relatively well organised. A guide is available outlining applicable procedures and ways and means of obtaining environmental information; an environmental information office is being opened on MATT's premises. At the regional and local levels access to information is uneven, reflecting a lack of co-ordinated procedures. Access often depends on the local community's level of environmental awareness, its commitment to providing information to the public, and the sensitivity of the issues involved. Even information on urban air quality is not systematically made available. Some cities have on-line displays; others provide information within one or two days. There is a general lack of knowledge about the type of information available and where to find it. Citizens and consumers are often not aware of their rights to information.

Public participation

Public participation in decision making remains relatively low, though participation has increased as a result of Local Agenda 21 initiatives. Projects undertaken by

municipalities are discussed in a consultative forum where a variety of stakeholders are usually represented. A Local Agenda 21 association has existed since 1999. It aims at facilitating exchange of best practices among the over 330 local bodies taking part in the Local Agenda 21 process. Many Local Agenda 21 projects are concerned with reviving the urban environment. Preparation of the draft National Strategy on Sustainable Development is under way, involving all interested stakeholders.

2. Focus on Selected Topics

2.1 Social context

Italy is one of the most *densely populated* OECD countries, with 187 inhabitants per km². Its population of 58 million occupies 301 000 km² (including Sicily and Sardinia). Some 36 million people live in northern and central Italy (15.7 million in the Po river basin alone). It is estimated that the population will increase to 58.4 million by 2020. Ageing is an important social concern; 18% of the population is 65 or older. Among OECD countries, Italy now has the largest share of population over 65. Financing public pension schemes or retirement income systems, and care for senior citizens, presents a great challenge (Figure 7.1).

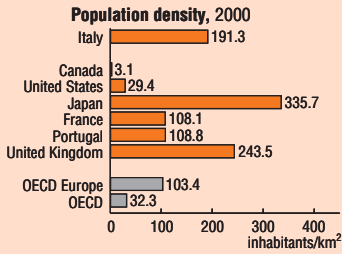
In 2001 over 67% of the population lived in communes with over 10 000' population. Rome, Milan and Naples have populations of about 2.6 million 1.3 million and 1 million, respectively. Some *16.7 million people live in the heavily exploited coastal zones*. Formerly a net population exporter, Italy is now a net population importer. In recent years there has been extensive illegal immigration from south-east Europe.

Italy's northernmost and southernmost points are 1 200 km apart. Climatic and geographical differences are considerable. Socially and economically, Italy is divided into three parts: the prosperous First Italy, the poor Second Italy in the South (the *Mezzogiorno*) and the intermediate Third Italy in the north-east and centre. *Disparities among regions* are especially pronounced between the North and South. The Third Italy has a number of SMEs and is approaching the First Italy socially and economically. Statistics show a wide gap in socio-economic conditions between the two extremes of North and South, despite longstanding efforts to achieve a better balance between the regions. Regional differences are reflected in GDP per capita, education, housing conditions, services and infrastructure, social unrest, and a number of environmental problems (especially water shortage) (Tables 7.3 and 7.4).

Despite a new territorial development strategy in 1998, and positive signs of economic revival in the South, regional disparities remain. The 2000-06 *Mezzogiorno Development Plan* (PSM), the main application of the new territorial strategy, makes

Figure 7.1 Social indicators

Population and ageing

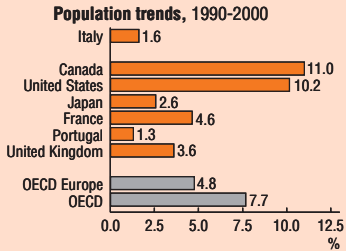


Population change		1993	2000
Natural increase	%	-0.1	-0.3
Net migration	%	3.2	3.1

Foreign population		1990	1999
	%	1.4	2.2

Ageing		1993	2000
Over 64/under 15	rates	0.98	1.23

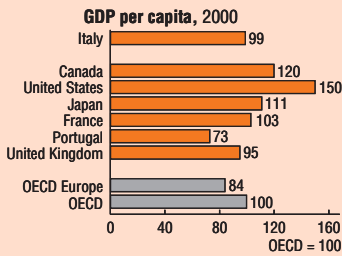
Settlement and mobility



Population by type of region		1999	1999	1999
	% population	% area	density	
Urban	49.4	22.3	424	
Intermediate	41.0	50.4	155	
Rural	9.6	27.4	67	

Mobility		1990	1999
Car ownership	veh./100 inh.	48	56
Rail traffic	billion pass.-km	48	46

Income and employment

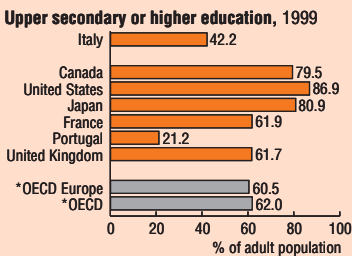


Regional disparities		1990	1997
GDP/inh.	variation coefficient	27.1	26.6

Labour force participation		1993	2000
Total rate	%	59.3	61.2
Female rate	%	42.5	46.8

Unemployment		1993	2000
Total rate	%	10.2	10.7
Female rate	%	14.6	14.5

Health and education



Educational attainment		1990	1999
Upper secondary or higher	%	..	42.2

Life expectancy		1990	1997
At birth: total	years	76.8	78.5
	female	years	80.0	81.6
At age 65: male	years	14.9	15.8
	female	years	18.6	20.2

Source: OECD.

use of EU Structural Funds and co-financing. The EU budget for Structural Funds allocates EUR 29.5 billion to Italy for the period 2000-06, of which 74% for the Mezzogiorno. Measured by some quantitative social indicators, such as hospital beds per 1 000 inhabitants, share of houses with bathrooms and heating, average number of inhabitants per room and family size, disparities between North and the South appear less extreme. However, converging levels of physical infrastructure do not necessarily imply that services are of the same quality. User satisfaction surveys indicate a lower approval level for health services in the South, irrespective of the quantity of services offered.

The agricultural sector provides 5.3% of employment; industry accounts for 32.1% and the service sector for 62.6%. Italy's service sector share is smaller than in other OECD countries, where services have generated the most new jobs. *Unemployment* has been and still is a major problem. The unemployment rate fell from almost 12% in 1995 to 9.5% in 2001, but most new jobs are temporary or part-time. In the medium term, Italy's extremely low birth rate could lead to labour shortage.

2.2 Health and electromagnetic radiation

The possible *health risks of long-term exposure to elevated levels of non-ionising electromagnetic radiation*, or "elettrosmog", has been debated more widely in Italy than in most other OECD countries. The risks of ionising electromagnetic radiation (e.g. X-rays, radioisotopes) have been well documented for decades. At the end of the 1990s, concerns arose about non-ionising electromagnetic radiation with a frequency of 0-300 GHz (i.e. low frequency, medium frequency or radio waves, and high frequency or microwaves) emitted from a range of sources. These sources include high-voltage power lines, transforming stations, personal computers, radio and television transmitters, cellular phones and related infrastructure, radar stations and radar equipment in general, and microwave ovens. Potential human health effects include leukaemia, brain tumours and congenital malformation. The activities of some NGOs and public authorities have been directed in particular at the Vatican's radio station, whose high-powered long-distance transmission towers are located in residential areas of Rome. In 2001 the Holy See agreed to reduce the power of Radio Vaticana's medium wave transmissions by 50%. Research has not yet provided clear scientific evidence linking use of radio frequency equipment and long-term health effects. A recent World Health Organisation (WHO) report points out that there is scientific uncertainty and suggests taking precautionary measures.

Intensive research on possible health risks of long-term exposure is being carried out in Italy and elsewhere. Ministerial Decree 381/1998 concerns *precautionary measures* that restrict and lessen human exposure to this type of radiation. Repeated

daily exposure to an electromagnetic field should not exceed four hours; the precautionary limits are 6 V/m for an electric field, 0.016 A/m for a magnetic field and 0.1 W/m² for radiation intensity at the point of impact. These limits, stricter than those in the 1999 recommendations of the Council of Europe, are among the strictest in the world for electromagnetic radiation. Some city councils and regional authorities have established stringent restrictions regarding minimum distances between installed equipment in urban areas, as well as lower exposure levels than those in national legislation. According to the Italian Environmental Strategy for Sustainable Development, a national register of all installations emitting electromagnetic radiation will be established. Citizens will be able to consult it to obtain information on the type and geographical location of such equipment.

8

SECTORAL INTEGRATION: TRANSPORT*

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the Environmental Performance Review of Italy:

- improve co-ordination of economic and environmental *planning of transport* among the state, regions, provinces and municipalities, and among national administrations;
- further develop *market-based integration* through implementing a mix of supply and demand measures (concerning infrastructure, vehicles, fuels and traffic, transport market reform, taxes and charges);
- strengthen *exhaust emission controls* and vehicle inspection, particularly for trucks and two-wheeled vehicles;
- further develop and implement a long term strategy and medium term action plan to create *alternatives to road transport* in long distance freight movements and in urban mobility, and to ensure an appropriate focus on transport infrastructure development;
- review and revise *transport taxes and charges*, so as to better internalise environmental externalities and eliminate distortions among transport modes (e.g. progressively reducing exemptions and/or incentives to road freight transport);
- ensure the effectiveness of *environmental impact assessment* (e.g. public participation, large infrastructure projects) and further implement strategic environmental assessment, in line with EU legislation;
- further strengthen international co-operation to reduce the share of road transport in *cross-Alpine freight movements*, with a view to minimising negative environmental impacts.

* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental Performance Review of 1994. It also reviews progress with respect to the objective “decoupling environmental pressures from economic growth” of the 2001 OECD Environmental Strategy.

Conclusions

Italy has made significant progress in integrating environmental concerns in transport policies and practices. The new General Transport Plan (PGT) has benefited from close co-operation between MATT and the Ministry of Infrastructure and Transport, as well as from strategic environmental assessment. Its objectives aim at *environmentally sustainable transport* and achieving international environmental commitments. Steps have been taken to promote coastal shipping and combined sea-land transport, and more recently to develop transport infrastructure and reform the transport sector. Concerning transport *infrastructure*, environmental impact assessments have often helped mitigate negative impacts on habitats and landscapes. Concerning the *economic and regulatory context*, financial assistance has been made available to promote clean public transport and sustainable mobility in urban areas; economic and fiscal incentives have encouraged use of environmentally friendly fuels and vehicles; road fuel taxes and prices are among the highest among OECD countries. Concerning *traffic*, many cities are innovative, increasingly including reduction of air pollution in comprehensive mobility plans along with public transport measures. Italy has long used road pricing on its motorway network. Concerning *vehicles*, improvements in technology and fuel quality, incentives promoting alternative fuels, low emission vehicles, vehicle scrapping schemes and exhaust emission controls have had environmentally positive effects. Despite increased traffic volumes, most air emissions from road transport have not increased.

Nevertheless, Italy's rate of motorisation is among the highest in OECD countries. Road transport (both passenger and freight) has continued to grow and dominates the modal split; alternative modes tend to lack competitiveness (e.g. public transport, combined road-rail freight transport). The transport sector remains by far the largest contributor to air emissions of NO_x and NMVOCs; transport related CO₂ emissions continue to grow, as do emissions from two-wheeled *vehicles*. There is widespread *urban traffic* congestion, leading to continuing exceedance of air quality standards in many cities. Progress in developing and implementing regional and urban air quality plans has been slow. The effectiveness of EIA procedures should be further improved. The benefits of renewing the private vehicle fleet with less polluting vehicles have been offset by increased and high ownership (of four-wheeled and two-wheeled vehicles) and larger average engine size; the share of old vehicles remains high in the case of *trucks, buses and two-wheeled vehicles*. Taxes and charges are not fully in accordance with the polluter pays principle or the user pays principle; in particular, *exemptions* are granted to commercial and road freight transport. Many of the recommendations of the 1994 OECD Environmental Performance Review remain valid. Further *co-ordination* is needed among national administrations, among

administrative levels (state, regions, provinces and municipalities), and with neighbouring countries. Further *sharing of positive experiences* at local level, greater use of *demand side management* tools, reform of transport related *taxes and subsidies*, and effective application of *EIA and SEA* procedures are also necessary.

Levels of motorisation in Italy are among the highest in any OECD country. The modal split is dominated by road transport, while alternative modes tend to lack competitiveness (Chapter 8, Section 2.1). Italy's performance integrating environmental and sustainability concerns in transport policies can be assessed against *three interrelated objectives* derived from its policy objectives and international commitments of the 1990s, the recommendations of the 1994 OECD Environmental Performance Review and the 2001 OECD Environmental Strategy. These objectives are: to reduce the environmental effects of transport through direct environmental measures; to foster the integration of environmental concerns in transport policies and practices; and to develop a sustainable balance between transport modes.

1. Evaluation of Performance

1.1 Policy objectives

Transport objectives

The *General Transport Plan* (PGT), revised every three years, sets out national transport objectives. In accordance with these objectives, Regional Transport Plans are to be developed by regional authorities, Urban Traffic Plans (PUTs) and Urban Mobility Plans (PUMs) by municipal authorities, and mobility plans by enterprises with over 300 employees.

A revision of the PGT proposed in 1993 considered reduction of environmental impacts and other externalities, along with additional transport objectives, but was never adopted. For 2000 estimated external costs of transport reached 10.3% of GDP (9.8% of GDP for road transport only) (Table 8.1). The 2001 PGT incorporates many of the 1993 objectives, with the *overarching goals of bridging the gap between transport supply and demand and improving economic efficiency and environmental effectiveness*. Placing transport objectives in a sustainable development context, it moves away from objectives by mode towards objectives by purpose. One objective is environmental sustainability of transport supply, including meeting international environmental agreements such as the UN Framework Convention on Climate Change (UNFCCC), the Convention on Long-range Transboundary Air Pollution (LRTAP) and the Convention on Biological Diversity (CBD). The 2001 PGT, which benefited from a Strategic Environmental Assessment (SEA), promotes the

establishment of sustainability objectives and indicators to assess progress. An annual progress report will be presented to the Inter-Ministerial Committee for Economic Planning (CIPE) and will subsequently be published.

These objectives are expected to be attained through a *combination of actions* ranging from infrastructure development, transport market reforms and improved logistics to promotion of environmentally friendly vehicles and transport modes, management of transport demand, and application of SEA to the definition of priorities, plans and infrastructure programmes. Measures responding to the specific needs of southern Italy are foreseen.

Table 8.1 **Estimated external costs of transport, ^a 2000**

	Total		GHGs (%)	Air pollution (%)	Noise (%)	Accidents (%)	Congestion (%)
	(EUR million)	(% GDP)					
Road transport	113 704	9.8	7.9	41.5	11.0	26.5	13.0
<i>of which:</i>							
Passenger	71 128	6.1	8.0	31.1	8.3	39.4	13.1
Freight	42 576	3.7	7.6	59.0	15.5	5.0	12.9
Rail transport	3 250	0.3	7.8	20.8	66.3	3.8	1.3
Air transport	2 637	0.2	26.8	23.6	45.6	3.7	0.3
Total	119 591	10.3	8.3	40.6	13.3	25.4	12.4

a) Indicative estimates based on calculations by *Amici della Terra*.
Source: Conto Nazionale dei Trasporti 2000.

Environmental objectives

Environmental objectives related to transport derive from Italy's international commitments (e.g. UNFCCC, LRTAP, CBD), EU directives, and national and sub-national policy plans and strategies (e.g. air quality, noise abatement, landscape protection). They include reduction of GHG and other air emissions, air pollution and noise abatement in urban areas, and biodiversity conservation. *Most of these objectives are in the 2001 PGT, along with measures and actions.*

Actions to meet Italy's *Kyoto Protocol* commitments have been given high priority. The 1998 CIPE Guidelines for the Reduction of GHG Emissions estimate that the transport sector will provide nearly 20% of needed CO₂ emission reductions: 4-6 million

tonnes by 2002, 9-11 million tonnes by 2006 and 18-21 million tonnes by 2008. Concerning urban air pollution, particular attention is given to reducing levels of benzene, PM₁₀ and PAHs.

The 1994 OECD *Environmental Performance Review* recommended in particular that Italy:

- re-establish an intergovernmental committee to ensure integrated economic and environmental planning of transport;
- draw lessons from those policies and actions which have already shown positive results, especially at city level, and encourage the sharing of these experiences;
- strengthen the enforcement of regulations concerning emission standards and vehicle maintenance;
- promote the implementation of a mix of concerted measures (measures concerning transport infrastructure, land use policies and planning, vehicles, traffic management, taxes and rates, public transport services, air quality plans, etc.) at national, regional and local levels;
- balance the modal split in transport supply through actively promoting and making competitive alternatives to road transport including combined freight transport and local public transport services; in particular, develop a long term strategy and medium term action plan to reduce significantly the share of road transport in long distance freight movements;
- strengthen international co-operation concerning cross-border transport.

1.2 Environmental measures concerning vehicles, fuels and infrastructure

Environmental measures concerning vehicles: cars and trucks

Government incentives were introduced in 1996 to progressively *eliminate old cars* and reduce the share of vehicles bought after 1990 to 75% by 2000. Combined with incentives for low-emission vehicles, they have resulted in renewal of the car fleet and reductions in air emissions. The proportion of old passenger cars has fallen to 37.2%; the share of cars equipped with catalytic converters increased from 8.5% in 1992 to almost 50% in 2000. However, the number of cars in use and average engine size have increased. The share of vehicles over ten years old remains important as regards trucks (50.8%), buses (60.9%), and two-wheelers (56.6%). In the period 2001-03, MATT will support purchases by citizens of new electric, methane or LPG powered vehicles and conversion of cars to run on LPG/methane with a further EUR 7.7 million per year.

Since 1998, public administrations and local authorities must maintain a *quota of low emission vehicles* in their fleet (5% in 1998, 40% in 2002, 50% in 2003). Financial assistance from MATT to buy such vehicles reaches 65% of the purchase price. A new fund (EUR 20.6 million) supporting municipalities' conversion of old vehicles to LPG or methane was established in 2001. MATT has also co-funded projects on construction of environmentally friendly motor vehicles (e.g. electric cars equipped with zinc-air batteries, prototype fuel cell cars); voluntary agreements have been signed with industry, transport operators and public transport companies.

Emissions are checked by means of compulsory *periodic inspections* of all vehicles including trucks. New vehicles are controlled after four years and every two years thereafter. Some municipalities have limited technical capacity to control private garages that perform vehicle checks, or to carry out on-street compliance control of vehicles, particularly trucks. In municipalities where city centre access is restricted to low-emission vehicles (*Bollino Blu* system), annual emission inspections are used to check emission standard compliance; with MATT support these inspections are being extended to two-wheeled vehicles.

Environmental measures concerning vehicles: two-wheeled motor vehicles

Given the large share of two-wheelers in Italian cities, the government has taken measures to tackle their air emissions. A voluntary agreement between MATT, the Ministry of Infrastructure and Transport (MIT), municipalities and the motorcycle industry (November 1999) is intended to promote electric two-wheeled vehicles and speed up *renewal of the fleet*: 50% of models for sale will comply with Euro2 standards as of July 2002; all vehicles produced will comply with these standards as of July 2003, anticipating compliance dates for the 1997 EU directive. Owners of old two-wheeled vehicles can use catalytic converter kits (sold at EUR 150-200) to retrofit their vehicles in compliance with Euro1 limits.

Old vehicle *scrapping incentives* between September 1997 and August 1998, applicable to new vehicle purchases, resulted in the scrapping of 250 000 mopeds (i.e. 36% of overall sales). Government support (EUR 38.7 million) was combined with significant VAT revenues (EUR 93 million). A subsequent initiative, launched in 1999 and financed equally by the government and manufacturers, links a scrapping incentive with purchase of electric and low-emission two-wheelers; as of 2001 this initiative is complemented by fiscal incentives promoting electric two-wheelers. Municipalities may add to these incentives.

Environmental measures concerning fuels

Italy has actively promoted *clean fuels* by offering tax breaks to companies that produce these fuels and ecological fuel additives, and by anticipating several EU

directives. Measures have been adopted to improve the environmental quality of fuels, including limitations on petrol's PAH content (implemented as of 1997 in anticipation of the 1998 EU directive) and further reduction of the benzene content from 2.5 to 1% and of aromatics content from 47 to 40%. Doubling the number of methane filling stations and expanding the number of LPG filling stations is foreseen, along with promotion of methane and LPG powered vehicles. Since Italy did not succeed in phasing out leaded petrol by January 2000, as required in the related EU directive, it was granted a two-year further delay.

Measures concerning infrastructure: environmental impact assessment

Since 1988 *large-scale infrastructure projects* are subject to environmental impact assessment (EIA). EIA procedures have been extended to smaller projects since 1996, mainly under the responsibility of regional or provincial authorities. EIA is mandatory for all motorways and four-lane roads of national importance, as well as all roads crossing protected areas; it is optional for roads of regional importance, depending on a first evaluation of the project proposal by the competent regional environmental service. Some regions have expanded application of mandatory EIAs to transport infrastructure projects crossing areas with special landscape features, in line with their regional plan for landscape protection. The National EIA Commission, which is very active, carries out an increasing number of procedures that often lead to the improvement of projects. Of 53 EIAs for transport infrastructure (roads, railways, airports) carried out between 1997 and 2000, five resulted in a negative assessment and eight were rejected because there was insufficient information.

The assessments carried out so far on the Italian *high-speed rail network* have benefited from very close co-operation between MATT, MIT, the Ministry of Cultural and Natural Heritage, the regions and local authorities. Commitments made under the EIA procedure are monitored by environmental observatories during the implementation phase and the first year of operation, benefiting from an agreement between MATT, other relevant administrations and the companies involved. Environmental mitigation measures account for about 10% of total investment for each rail section. They may exceed 18% in particularly sensitive areas.

Difficulties remain regarding i) distribution of responsibilities between national and regional authorities; and ii) variability among regions with respect to the procedures applied. Difficulties integrating the EIA procedure in planning and authorisation processes have sometimes led to longer procedures and hampered EIAs. Local opposition to new infrastructure projects is high, sometimes challenging decisions even after project completion. More needs to be done to encourage public participation during planning phases (Chapter 6).

Air pollution

As a result of national actions concerning vehicles and fuels, Italy has had some success in *reducing most emissions from road transport* though there has been an increase in total vehicle–kilometres travelled. NO_x, CO and NMVOC emissions have decreased by 16%, 25% and 17% respectively since 1990. Around 4% of reductions in NO_x emissions are estimated to be due to the government's vehicle scrapping incentives. Despite these real successes, the impacts of transport related emissions on urban air quality and their relation to climate change raise concern (Tables 8.2 and 8.3). CO₂ emissions from transport (particularly road transport) increased by 16% during the 1990s, reaching 31% of total emissions. Transport (particularly road transport) remains the *largest contributor* to NO_x, NMVOC, CO and small particulate emissions. Maritime and air transport emissions are increasing steadily. Emissions from mopeds and motorcycles have also steadily increased; their share in road transport emissions has doubled since 1990 for CO and NMVOCs, reaching 22% and 34% respectively in 1999. Two-wheelers also contribute a significant share of particulate emissions. The high density of urban road traffic leads to exceedances of air quality standards in many cities (mainly for ozone, benzene and small particulates, but also for CO and NO₂).

In view of expected continued growth in transport demand, doubts remain about Italy's capacity to *further reduce transport related GHG emissions* as planned. Progress will depend on demand management, modal transfers from road transport to other modes, and further improvements in energy efficiency and the age structure of vehicle fleets. In particular, it will require implementation of regional and urban air quality plans and their effective integration with traffic and mobility management. Greater attention needs to be given to measures related to trucks and two-wheelers (vehicle inspection, exhaust emission controls, further modernisation of the fleet) and to implementation of Euro4 exhaust emission standards.

1.3 Fostering the integration of environmental concerns in transport policies and practices

Overall, Italy faces the challenge of implementing integrated environmental and transport policies more effectively and efficiently. This problem is *largely addressed by the 2001 PGT* and by integrated approaches to transport and mobility management. Implementation will be the determining factor in improving the Italian transport sector's environmental effectiveness and economic efficiency. Appropriate mechanisms are needed to monitor the results obtained. Greater and more efficient co-ordination among governmental levels (state, regional, provincial, municipal) is also needed, as well as more effective co-operation among relevant national administrations.

Table 8.2 Air emissions from transport,^a 1980-1999

	Emissions from transport					Emissions from road transport				
	(000 tonnes)		Change (%)		Share in total emissions (%)	(000 tonnes)		Change (%)		Share in transport emissions (%)
	1999	1980-90	1990-99	1990		1999	1980-90	1990-99	1990		1999
CO ₂	131 545	45	16	26	29	109 574	48	17	83	83
NO _x	1 034	37	-11	60	70	748	38	-16	77	72
CO	4 637	5	-24	84	77	4 141	5	-25	90	89
NMVOCs	999	-4	-15	57	60	803	-7	-17	82	80

a) Includes emissions from all mobile sources.

Source: ANPA.

Table 8.3 Air emissions from road transport by type of vehicle, 1990-1999

(%)

	Passenger cars			Goods vehicles and buses			Motorcycles and mopeds		
	Share in road emissions		Change	Share in road emissions		Change	Share in road emissions		Change
	1990	1999		1990	1999		1990	1999	
CO ₂	60	62	22	37	34	7	3	4	55
NO _x	58	54	-22	41	45	-9	0	1	47
CO	84	73	-35	5	5	-22	11	22	51
NMVOCs ^a	49	38	-35	7	7	-14	17	34	64

a) Shares in road emissions do not include petrol evaporation from vehicles.

Source: ANPA.

Institutional integration

Since 1990 many steps have been taken at the national and local levels to foster policy integration: integration of environmental objectives in national transport planning; SEA of the 2001 PGT and of transport projects financed by 2000-2006

European Structural Funds; EIA of transport infrastructure projects; and integrated mobility management in urban areas. Integration of regional and local air quality and traffic planning has progressed in large metropolitan areas. This has been done in the context of restructuring and the decentralisation process.

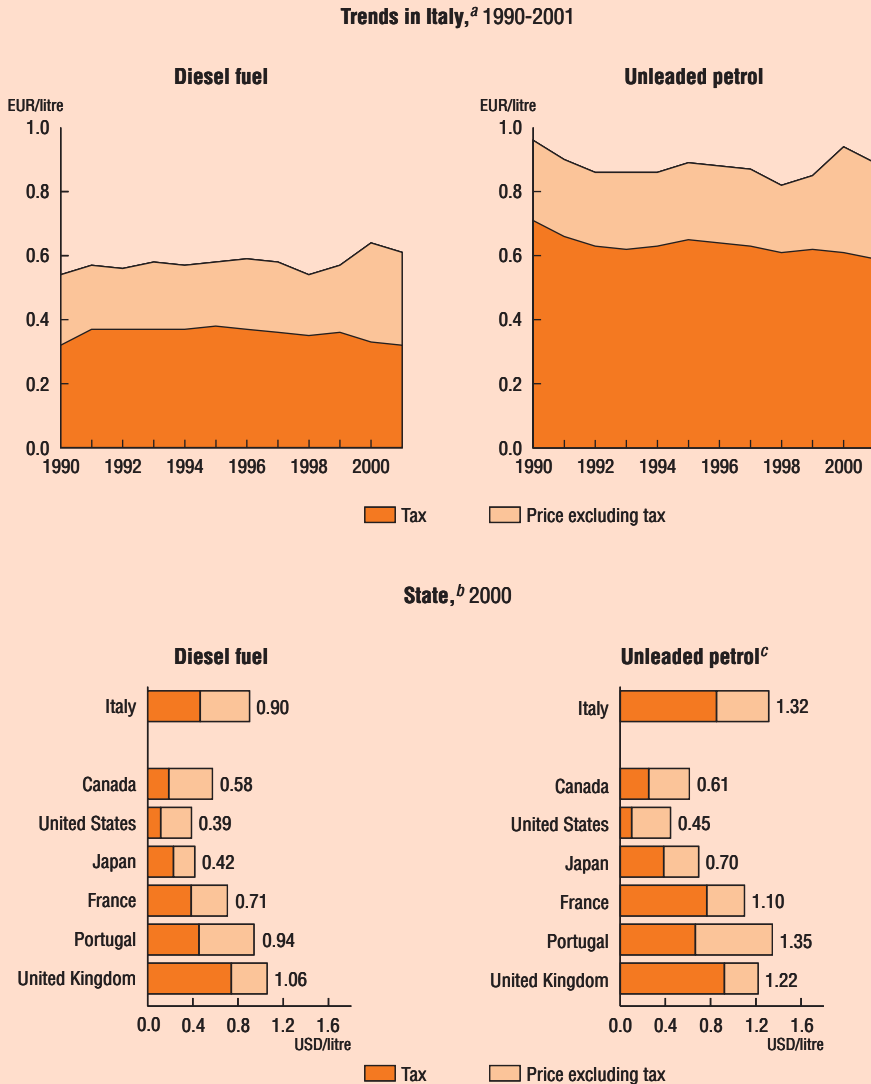
At national level, responsibilities for transport policy were revised in 2001 and grouped in a new *Ministry of Infrastructure and Transport* (MIT). Fuels, EIA and territorial protection are now partly or fully under the Ministry of Productive Activity and MATT, respectively. The Ministry of Health has responsibility for pollution standards and the Ministry of Finance for fiscal measures. Since 1994, inter-ministerial consultation and co-ordination on economic and environmental planning of transport have been carried out through CIPE. The Service Conference, created in 1997 to speed up public decision making processes, facilitates involvement of all competent administrations in the approval of projects put forward by MIT. The Commission on Sustainable Development, established within CIPE in 1998, also plays a role, as do the three Conferences that foster co-operation among government levels and the network of national and regional public authorities set up to manage use of EU Structural Funds and monitor compliance with environmental requirements.

At *sub-national level*, the regions have long had a limited role in budgetary decisions and in national planning. A number of state responsibilities have been transferred to the regions during the decentralisation process, including those for road and rail networks of regional importance that can further be delegated to provinces. This has been accompanied by a transfer of resources and revenue raising powers, allowing regions and local authorities to perform related administrative functions. The capacity of local authorities to use these resources and cope with their new responsibilities varies considerably, especially in the case of small and very small municipalities (58% of the total) and municipalities in the South. Infrastructure of national importance remains in the hands of the government. Traffic management and urban mobility policies are the responsibility of municipal authorities.

Market based integration: fiscal measures

Road *fuel prices and taxes* are among the highest in any OECD country. Taxes on road fuels in 2001 were as follows: EUR 0.382/litre for diesel (52.6 % of full price), EUR 0.739/litre for leaded petrol (67.5% of full price) and EUR 0.695/litre for unleaded petrol (66.1% of full price). Environmentally friendly fuels such as methane and LPG are subject to lower prices and taxes. Public transport benefits from a reduced VAT on motor fuels (10% instead of 20%). The tax differential between diesel and petrol has been reduced, though not enough to fully address the pollution burden of diesel (Figure 8.1). Since 1998 taxes on vehicle sales and annual

Figure 8.1 Road fuel prices and taxes



a) At constant 1995 prices.
 b) In USD at current prices and purchasing power parities.
 c) Unleaded premium (RON 95). For Japan and Canada: unleaded regular.
 Source: OECD; IEA.

registration have been based on engine power and vehicle size. Electric, methane and LPG powered vehicles are exempt from the annual vehicle tax for a period of five years, after which the tax to be paid equals one-quarter of that on petrol powered vehicles of similar size. For methane and LPG powered vehicles the reduced charge is subject to compliance with EU legislation on exhaust emission standards. Road pricing has long been used; all vehicles pay tolls on motorways. Pricing of urban parking is well established and city centre access charges are increasingly being used. Aircraft are subject to a regional noise tax, based on type and weight, which is earmarked for compensation of municipalities and citizens near airports (Chapter 6).

Fuel tax exemptions and refunds are granted to commercial transport, civil and military aviation, agriculture and the fishing industry. Commercial diesel fuel is exempt from VAT; heavy goods vehicles are granted an additional reduction on the price of diesel of about EUR 0.088/litre. Residents of the autonomous region of Friuli – Venezia Giulia are granted price reductions on petrol to minimise purchases across the border in Slovenia, where fuel prices are much lower. Reductions, which vary according to the distance from Slovenian border, range from EUR 0.222/litre to EUR 0.124/litre. Heavy vehicles are granted reduced motorway tolls to encourage a shift in freight transport from normal roads to motorways. Reductions are also granted for freight movements between northern and southern Italy in order to support economic development of the South. Hence the environmental costs of transport are not equally shared, the burden lying primarily on operators of private cars.

The economic and environmental effectiveness of *transport related taxes and charges* needs to be reviewed. Taxes and charges should be set in accordance with the polluter pays and user pays principles, possibly reducing the tax differential between diesel fuel and unleaded petrol, strengthening fiscal incentives to promote cleaner fuels (including low sulphur fuels), and progressively reducing exemptions granted to commercial transport.

1.4 Developing a sustainable balance between transport modes

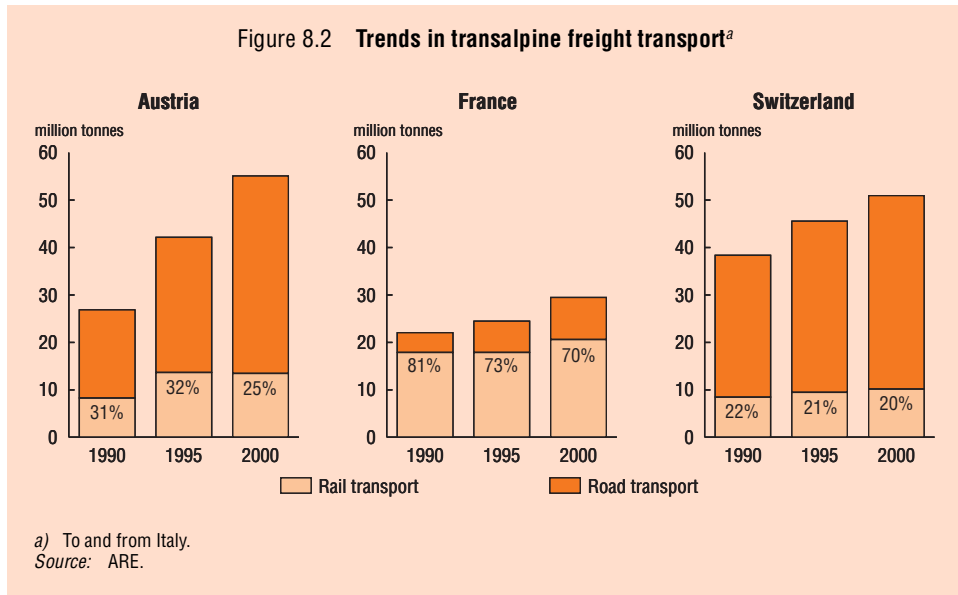
Italy has promoted coastal shipping and combined freight transport. It has also taken measures to develop urban public transport and a wealth of traffic management measures have been adopted in many urban areas (Chapter 8, Section 2.2) including Rome (Chapter 8, Section 2.3). However, *competitive alternatives to road transport are lacking* due to infrastructure deficits, management inefficiencies, inadequate use of market based mechanisms, and problems with the quality of service in several transport segments (this applies to both freight and passenger transport, and to both urban and interurban transport).

Cross-border freight transport

Inter-modal transport (i.e. combined sea-land and rail-road transport) has progressed with the growth of trans-shipment terminals at several Italian ports, inter-portual hubs, and connections with rail and road networks. Container movements at Italian ports have increased by 219% since 1990. The port of Gioia Tauro in southern Calabria has become the largest container trans-shipment terminal for the Mediterranean area and the fifth port in Europe. The ports of Trieste, Monfalcone, Fiume and Capodistria have co-operated on the establishment of a hub for freight movements in the Adriatic Sea. Road transport remains prevalent in transalpine and combined sea-land freight transport.

Italy has signed but not yet ratified the Transport Protocol of the *Alpine Convention*. co-operation has also been established between Italian border regions and neighbouring countries: with Switzerland, as part of the EU INTERREG programme, and between the Friuli – Venezia Giulia region and Slovenia (Slovenia has received financial assistance to upgrade its transport networks). There are some differences among the Alpine countries regarding management of traffic flows, minimisation of related environmental impacts, and investment in transport infrastructure (Figure 8.2). Progress will require greater co-operation and co-ordination

Figure 8.2 Trends in transalpine freight transport^a



among these countries, with a view to a long-term strategy and a medium-term action plan to reduce the share of road transport in transalpine freight movements and minimise negative environmental impacts.

Local public transport

Financial assistance to regions and municipalities by government (MATT, MIT) supports *environmentally friendly public transport* and the modernisation of local public transport services and vehicles. Purchase of new buses is part of a ten-year plan (1998-2008) and of the 2001 PGT. Programme agreements have been signed with municipal transport companies. Measures include dedicated bus lanes, expansion of local rail networks, fuel cell powered public transport buses, and low-emission shuttle buses travelling to and from park-and-ride areas equipped with appropriate filling stations.

Local public transport is not yet as cost-effective as it could be. It suffers from a *need for more rail infrastructure*, relatively low levels of equipment and service, and heavy reliance on congested road transport (67%). Public transport is a real alternative to use of cars and two-wheeled motor vehicles. However, urban bus use fell by 6% between 1990 and 2000, whereas private car use for urban trips increased by 37%. While efforts to expand urban railways are showing initial results, the overall supply remains low; underground lines in Milan, Naples, Rome and Genoa total some 122 km; tram lines in Turin, Milan, Rome, Naples, Genoa and Trieste total some 407 km.

Transport market reform

Reform of the Italian transport market, aimed at introducing greater competition and removing distortions due to state interventions, has gained momentum in recent years. It is expected to provide new opportunities for re-balancing transport supply and therefore generate environmental benefits. Reform focuses on *privatisation, liberalisation and decentralisation*. Concerning the road sector, the motorway operator Autostrade has been privatised (with a 20-year extension of its concession). In the rail sector a first set of measures was taken, beginning in 1997, to improve organisational efficiency through changes in the relationship between the state and the national railway (Ferrovie dello Stato, FS). A second set of measures followed in 2000, involving third-party non-discriminatory access to infrastructure, legal separation of the trade network from services, liberalisation of all passenger and freight segments, and tighter budget constraints on the incumbent firm. The reform of local public transport has led to full decentralisation of responsibilities and, as of January 2002, separation of the planning and control functions of local authorities from management of transport services, which are contracted out to transport firms.

Co-ordination and monitoring are ensured by the central government, which also provides financial support to address urban mobility problems.

Whether and to what extent ongoing market reform produces concrete environmental benefits will depend on its capacity to provide incentives to *improve the quality of transport services* (e.g. public transport, long distance rail freight transport, multi-modal services) and to provide alternatives to road transport. It will also depend on the extent to which the external costs of transport are integrated into transport prices and how they are shared among modes.

Infrastructure development

Investments in infrastructure during the first half of the 1990s were modest (consistent with a decrease in overall public investment) and concentrated on motorways. A high-speed rail network began to connect major Italian cities with the European network in the second half of the decade (using new lines and upgraded existing ones). Rail and road networks have been improved in the South, with partial financing by the European Regional Development Fund. Infrastructure development overall has been slow, leaving Italy with uncompleted construction projects and urgent maintenance needs in several transport segments. The *backlog is particularly pronounced in the South*. Bottlenecks also exist in the Alpine region and at the Slovenian border. This affects quality of service and competitiveness, particularly in the case of freight transport, and has implications for the modal split. Intensity of use of road infrastructure, which increased by 29% over the last ten years, remains high compared to that in other European countries.

A *national programme for strategic infrastructure projects*, identified in co-operation with the regions and included in the 2001 PGT, was adopted in December 2001. It foresees an investment of EUR 126 billion over ten years, of which 45% would be dedicated to development in the Mezzogiorno. The programme encompasses north–south and east–west road and rail connections, including completion of the high-speed rail network; transalpine crossings (Fréjus, Sempione, Brenner); integrated transport nodes around Rome, Naples and Bari; and a bridge over the Strait of Messina. Other projects include further development of the national network of multi-modal terminals and corridors for freight transport, including interportual hubs, sea motorways, and connections between Italian transshipment terminals and European networks. To accelerate projects completion, the government is reforming authorisation procedures for strategic infrastructure projects in accordance with EU legislation. Completion of these projects will require consideration of their environmental implications and a balance between socio-economic and environmental objectives. This will call for effective EIA procedures, as well as appropriate public information and participation (Chapter 6).

2. Focus on Selected Topics

2.1 Current transport trends: high motorisation and domination of road transport

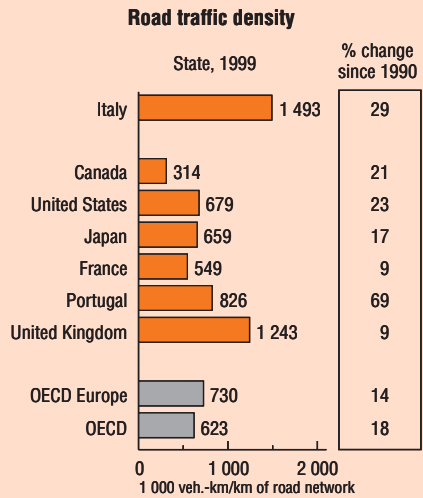
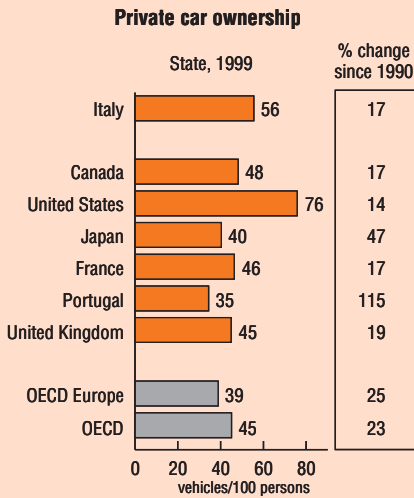
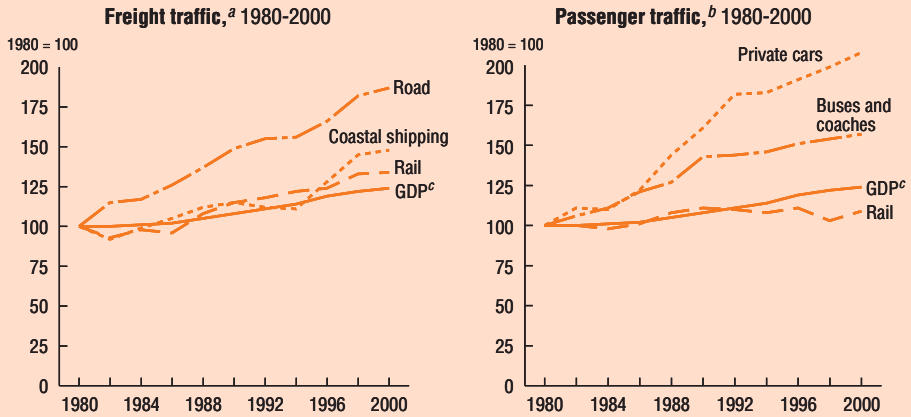
Private car ownership rose by 16% during the 1990s, reaching 32 million passenger cars and 56 cars per 100 persons in 2000, one of the highest ratios among OECD countries (Figure 8.3). The increase in the number of goods vehicles (+37%) is above the OECD average. Italy is characterised by an extremely high number of two-wheeled motorised vehicles. There are around 10 million of these, including 7 million mopeds and scooters.

Freight and passenger transport growth rates since 1990 have exceeded growth in GDP. In particular, road traffic (+31%) dominates the modal split with a 72% share of freight transport and a 93% share of passenger transport in 1999 (Figure 8.3). These shares, among the highest in any OECD country, are not consistent with the objectives of the 1994 PGT. Over the next ten to 15 years, demand for road transport is expected to increase by an additional 14-33% for passengers and 12-28% for goods.

In 1999, 417 million tonnes of freight was transported to and from Italy, mainly by sea (60%) but also by road (25%) and rail (15%). Over one-half of these movements resulted from European trade within the EU (35%) and with other European countries (19%); road transport represented 62% and 19% of this European trade, respectively. *Transalpine transport* is estimated to have increased by 35% during the last decade. Transport by road, which has grown by 42%, represents two-thirds of the total; more than one-half of transalpine freight transport crosses the borders with Austria and Switzerland, where increases have reached 53% and 55% respectively and restrictions have been imposed on heavy goods vehicles (Figure 8.2).

Total *energy use for transport* has increased by 20%, reaching 32% of total final energy consumption. Most of this growth has come from road transport, whose share has stabilised at 89%. The 19% growth in transport energy use is roughly in line with GDP and slightly lower than growth in traffic volumes (+25%), reflecting a decrease in the energy intensity of road traffic over the past decade. Road fuel consumption has included a 36% increase in petrol consumption and a more moderate increase in consumption of diesel (6%) and other fuels such as LPG and natural gas (6%). The share of LPG and natural gas in total road fuel consumption (5%) is among the highest in OECD Europe; this share has not increased since the mid 1990s, mainly due to an inadequate number of filling stations. Energy use for air transport has shown the most rapid growth (+54%), representing 9% of total transport energy use.

Figure 8.3 Trends in the transport sector



a) Index based on values expressed in tonne-kilometres. 2000 data: Secretariat estimates.
 b) Domestic transport; index based on values expressed in passenger-kilometres. 2000 data: Secretariat estimates.
 c) GDP expressed in 1995 prices and purchasing power parities.
 Source: MIT; ECMT; AAMA; IRF; OECD.

2.2 Traffic management in urban areas: a wealth of innovative measures

Urban Traffic Plans (PUTs) were introduced in 1992 for municipalities with over 30 000 inhabitants. *Urban Mobility Plans* (PUMs), introduced in 2000, are five-year planning instruments that apply an integrated approach to mobility and are financed according to objective; co-funding by the government is subject to compliance with objectives defined at national level.

Many innovative measures have been taken by Italian cities. These measures fall into a number of categories. *Traffic restriction* applies to central areas, permitting access only to public transport and low-emission vehicles (*Bollino Blu* system). Following pilot projects in the 1980s and early 1990s, these measures are now being implemented in many cities on a permanent basis to protect historic centres or highly polluted areas, or on a temporary basis when pollution thresholds are exceeded. Some cities (e.g. Rome, Bologna, Florence) have begun implementing automated electronic access controls to limited traffic zones, sometimes in combination with road pricing. Use of pedestrian zones, cycling lanes and park-and-ride (P&R) areas has grown, and parking pricing policies have gained in importance. Measures are often part of comprehensive plans tackling overall urban mobility problems that recognise pollution control as an important objective. Pilot projects on integrated planning of urban traffic and air pollution control, combined with the use of telecommunication technologies and development of environmentally friendly public transport, have been implemented in several cities: Turin (5T project), Florence (JUPITER and SLAM projects), Bologna (ENTIRE project) and Rome (HEAVEN project). As part of national measures to reduce GHG emissions and mitigate air pollution, MATT has co-funded innovative sustainable mobility systems in 30 municipalities.

In 1999, to reduce the *health impacts of traffic in urban areas*, the government adopted a set of threshold levels for benzene, PM₁₀ and PAH above which traffic restriction measures for motor vehicles including two-wheelers would apply in cities of over 150 000 population, cities identified by regions as having high air pollution risks (and already subject to compulsory air quality plans) and cities with an important risk of exposure to air pollution and traffic congestion. As of 31 January 2000, these cities were required to prepare an annual air quality assessment report describing major emission sources and pollution levels and presenting measures taken to reduce transport emissions. Vehicles complying with the most recent EU emission standards and public transport vehicles may be exempted from the restrictions. In January 2002 Milan and other cities in Lombardy temporarily banned use of private cars due to high particulate concentrations.

Since 1998 companies with over 300 employees must nominate a mobility manager responsible for developing, in collaboration with municipalities, a *mobility plan* to reduce home-work trips by car though promoting public transport,

car-sharing, electric cars and taxi-bus systems. A national programme for local car-sharing services has been created in co-ordination with interested municipalities. An electric car-sharing programme was launched in Rome, Milan, Turin, Modena, Brescia, Udine, Florence, Bologna and Venice in 1999. Each city has 500-600 electric cars, which customers may use upon payment of a membership fee. Similar systems have been put in place to promote two-wheeled electric transport.

Other initiatives include the “*car-free Sundays*” implemented in 200 municipalities. On these days public transport is free and often many museums are free as well. Information materials for schools (comic books and other publications, CD-ROMs) are available. Actions are also planned to reorganise freight transport in urban areas by promoting combined transport pick-up and delivery operations and “freight booking” systems, using low emission vehicles and limiting the time periods during which goods may be delivered in city centres.

2.3 *Tackling environment and mobility problems in Rome*

Mobility in Rome is characterised by expanding traffic flows and a *historical gap between supply and demand for public transport*. Passenger transport is dominated by private cars and two-wheeled vehicles. At 0.66 cars per inhabitant, car ownership is 10% above the high national average. Only 37% of the car fleet is equipped with catalytic converters; out of 500 000 two-wheelers in use, 337 000 are two-stroke mopeds. Traffic related air pollution damages buildings and leads to high renovation costs.

Since 1994, Rome has taken many measures to address air pollution and traffic problems. These measures, whose implementation was accelerated during preparations for the city’s 2000 Jubilee celebrations, combine short- and long-term planning instruments, organisational measures, and economic and social instruments. The 1999 *General Urban Traffic Plan* (PGTU) is co-ordinated with the new City Master Plan, to be approved in June 2002, and is being complemented by an Urban Mobility Plan.

Concerning *traffic restrictions*, the PGTU divides the metropolitan area into four areas. In the historic centre or “blue area” (5.5 km²) traffic has been restricted on a permanent basis since 1996; since January 2000 access has been limited to low or zero emission vehicles; since October 2001 access has been controlled via 22 electronic access gates using Telepass technology. In the “Railway Ring” (48.4 km²) traffic restrictions are applied to vehicles that do not comply with EU standards; the restrictions apply to non-residents (as of January 2002 for diesel vehicles, as of 30 June 2002 for petrol cars) and residents (as of January 2003). In the “green area” (154 km²) traffic restrictions are applied on a temporary basis when pollution thresholds are exceeded.

The size of pedestrian areas has increased, on-road pay parking has been introduced to prevent traffic transfers to neighbouring areas, and the number of P&R parking places grew from 1 500 in 1996 to 12 000 in 2001. P&R parking is free to holders of a one-year public transport pass. Access to the green area by tourist buses is controlled; they are directed to parking areas with connections to public transport. Since 1999 non-resident private cars are banned along “green axes” in the city’s most polluted areas. These streets, dedicated to public transport, are subject to special rules for goods loading/unloading. Since 1996 cars circulating in the city centre (blue area) have been required to undergo annual exhaust emission controls. Inspections have been mandatory for all cars since January 2000 and for two-wheelers since January 2002 (*Bollino Blu* system).

Traffic is monitored and controlled using an *integrated telematic system* that manages blue area access and the parking and traffic light systems. Rome’s Traffic Management Agency (STA) operates the system. Established in 1996, STA is also responsible for the city’s mobility plan, the network of firms’ mobility managers and the promotion of electric vehicles; it has been given relevant land use competencies. A traffic control and information centre, established in 1999, collects real time geo-referenced traffic data and combines them with air emission and dispersion models to calculate pollution levels. This system, in operation since 2000, is part of the HEAVEN project also implemented in other European cities. Traffic information is available to the public via the teletext pages of the local TV channel RaiTre, e-mail alert messages, Internet and on-street electronic information panels. Real-time information on air pollution is planned but not yet available.

Municipal incentives exist for *scrapping of old cars* and purchases of low or zero emission cars and two-wheelers. These are in addition to the government’s scrapping incentives and cover 45% of purchase costs (30% by the municipality and 15% by manufacturers). They are accompanied by public information campaigns (e.g. “Become a Green Rider” and “Send Your Moped to the Wreckers, Don’t Wreck the Environment”). In 2000-01 the municipality spent EUR 31.4 million on sustainable mobility measures (32% from its own budget and 68% from MATT funds). Funds are allocated to services such as car pooling and car-sharing, a collective taxi system and the mobility manager system. An electric scooter rental service was launched in 1999. Car-free Sundays are organised regularly.

Measures concerning public transport supply include *expansion of the metro and tram networks* through construction of new lines and extension of existing ones, and renovation of the bus fleet with environmentally friendly vehicles including hybrid petrol-electric buses and electric minibuses. In 1995 an integrated ticket system (Metrebus) was introduced for all public transport modes in the region (metro, tram, bus). An annual pass is available (EUR 186 for the city area); reductions are granted

to commuters whose companies have a mobility manager. In addition, dedicated bus lanes have been created, the traffic light system has been modified to give priority to public transport, and minibuses are being used in the narrow streets of the city centre.

Some of these measures were implemented only recently and cannot be fully assessed. Judging from *initial results*, there has been an increase in the number of trips using public transport and in the average speed of public transport buses, a renewal of the private car fleet, and increased sales of electric two-wheelers. Air quality has improved since 1993, with a decrease in annual average CO and NO₂ concentrations of 32% and 7% respectively and, since 1997, a decrease in annual average benzene concentrations. Annual average ozone concentrations have increased by 59%; the number of exceedances of air quality standards for CO, O₃, PM₁₀ and benzene remains high.

Part III

INTERNATIONAL COMMITMENTS

9

INTERNATIONAL CO-OPERATION*

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the Environmental Performance Review of Italy:

- increase the amount of *official development assistance* towards the Rio commitment of 0.7% of GNP;
- increase bilateral environmental ODA, as well as *environmental co-operation* with south-eastern European and other Mediterranean countries (e.g. Mediterranean Action Programme hotspots);
- implement, monitor and develop the national programme of *greenhouse gas emissions reductions* to meet the Kyoto target;
- continue effective implementation of the Montreal protocol and relevant EU regulations on *ozone depleting substances*; in particular, continue to enforce the ban on trade of CFCs;
- strengthen protection of the marine environment from *land-based pollution* (from agriculture, industry, traffic and municipal waste water);
- ratify and implement the few remaining recent *international environmental agreements* awaiting ratification (Annex II).

* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental Performance Review of 1994. It also reviews progress with respect to the objective “global environmental interdependence” of the 2001 OECD Environmental Strategy. A number of other international issues are treated in other chapters, such as hazardous waste (Chapter 4), nature protection and biodiversity (Chapter 5), sustainable development (Chapter 6) and transport (Chapter 8).

Conclusions

As a G7 member, a founder of the EU and a Mediterranean country, Italy has continued to support international environmental co-operation very actively, ratifying most agreements and enacting most EU directives, including for *climate change and air pollution* commitments. It is to be commended for its *low energy intensity*, its clear GHG emission reduction *targets*, and its precise estimates of the environmental impacts of the national climate programme. In the 1990s Italy's performance in meeting international commitments to reduce *air emissions* was most satisfactory, with major reductions of SO_x and certain heavy metals as well as dioxins and furans. This progress will serve as encouragement in view of the further ambitious commitments being made (e.g. under the Gothenburg Protocol, to be ratified). With respect to *marine issues*, developments in the late 1990s have been positive for oil spill prevention, emergency response and ship safety, with quite significant equipment improvements, enforcement and commitments. Environmental co-operation with neighbouring countries has developed: Italy, France and Monaco have created a 100 000 km² *sanctuary* for protection of marine mammals, especially cetaceans, whose international status should be strengthened by UN recognition. Italy has also been very active in promoting international co-operation, particularly in the area of drought and *desertification*. It has ratified all relevant international conventions concerning nature protection and biodiversity.

Under a business as usual scenario, GHG emissions in 2010 would reach a level 13% above the Kyoto target. Italy would therefore have difficulty achieving its *Kyoto target* (i.e. reducing GHG emissions by 6.5% relative to 1990) without fully implementing its recent national GHG emissions reduction programme (set out in the national Kyoto Protocol ratification law passed in May 2002). According to recent projections, strongly reinforced policies and measures as well as improved monitoring and enforcement are needed, along with appropriate public and private sector involvement. Concerning protection of the Mediterranean from *land-based pollution*, most importantly from agriculture, industry and untreated municipal effluents, too little progress has been made and much remains to be done; monitoring and reporting on the state of the surrounding seas should be reinforced. There is concern about the effect of *overfishing* on some fish stocks, which translates into significant reductions in Italian catches and consequent difficulty adjusting Italian fishing capacities to new circumstances. Italy's *official development assistance* has fallen to a very modest 0.13% of GNP. This ODA level does not seem commensurate with Italy's international role or with the size of its economy. However, the Italian government, which is committed to the EU goal of 0.33% of GNP by 2006, has indicated its intention to further increase its ODA to 1.0% of GNP at a later date.

1. Evaluation of Performance

Italy's international co-operation activities are carried out at bilateral and subregional levels, as well as at the EU, regional and global levels. Italy shares frontiers with France, Switzerland, Austria and Slovenia. Its marine areas adjoin those of France, the Balkan countries with Adriatic coastlines, Greece, Libya, Tunisia and Algeria. Because of its geographical location, Italy plays a special role in fostering environmental co-operation between more developed European countries and the Mediterranean region's less developed countries. As a founding member of the EU, it has been in a position to influence the negotiation of EU environmental directives. Its national environmental policies have been greatly influenced by the body of European environmental legislation. As a G7 country, it has special responsibilities for global issues such as sustainable development. Italy is a party to a wide range of international environmental agreements (Chapter 9, Section 2.1 and Annexes II.A and II.B). Its performance with respect to these agreements is assessed in this chapter.

Evaluation of Italy's performance regarding international environmental co-operation is also assessed in view of the relevant *recommendations of the 1994 OECD Environmental Performance Review*, which included:

- ratifying and implementing a number of recent international agreements;
- improving co-ordination on the protection of the marine environment;
- improving inter-ministerial consultation on international environmental issues;
- ensuring a better protection of the coastline by reinforcing the means available to prevent marine disasters and to cope with their consequences;
- giving a higher priority to the protection of natural areas of international significance;
- strengthening co-operation with southern Mediterranean countries and with developing countries by increasing environmental aid in regional and in multilateral institutions.

1.1 Climate change

Greenhouse gas (GHG) emissions increased by 4.4% in the period 1990-99 (Tables 9.1 and 9.2). Per capita carbon emissions are roughly 2.1 tonnes, compared with an EU average of 2.4 tonnes, an OECD average of 2.8 tonnes and an average in the United States of 5.6 tonnes. Despite a decrease in CO₂ emissions from manufacturing industries, increases in those from energy production and transport have

Table 9.1 CO₂ emissions by activity
(Mt)

	1990	1995	1999	Change 1990-99 (%)
Energy ^a	409.5	418.6	431.3	5.3
Energy industries	142.9	140.3	146.6	2.6
Manufacturing, construction	86.9	89.4	80.5	-7.4
Transport	101.8	112.1	121.2	19.1
Other	77.9	76.5	83.0	6.5
Industrial processes	24.7	20.4	21.5	-13.0
Solvents, etc.	1.7	1.4	1.3	-23.5
Agriculture	1.0	1.0	1.0	0.0
Waste	1.5	1.6	1.7	13.3
Other activities	1.4	1.5	1.8	28.6
Total (without LUCF)^{a, b}	437.7	442.5	456.5	4.3

a) Numbers may not add because of rounding.

b) LUCF = land use change and forestry (i.e. sinks).

Source: ANPA; UNFCCC.

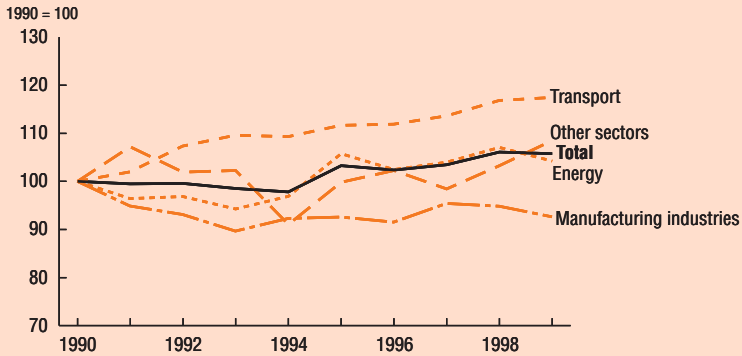
Table 9.2 GHG emissions
(kt CO₂ equivalents)

	1990	1999	Change 1990-99 (%)	2010	Change 1990-2010 (%)
CO ₂	437 750	456 533	+4 ^a	..	..
CH ₄	40 206	41 256	+3	..	..
N ₂ O	39 719	39 896	+0.4	..	..
HFCs	351	2 885	+722	..	..
PFCs	238	172	-28	..	..
SF ₆	198	386	+95	..	..
Total GHG	518 461	541 128	+4.4	624 000^b	+20.3

a) Estimated at +6% in the period 1990-2000.

b) Projected estimate.

Source: ANPA; UNFCCC.

Figure 9.1 CO₂ emissions by major sources, 1990-99

Source: OECD; IEA.

resulted in an overall increase in total CO₂ emissions (Figure 9.1). Noting the increase in GHG emissions, the National Programme for the Containment of Carbon Dioxide Emissions by 2000 at 1990 levels, approved by the Inter-Ministerial Committee for Economic Planning (CIPE) in 1994, was updated and published as the Guidelines for National Policies and Measures for Reduction of GHG emissions in 1998.

Italy has *one of the lowest energy intensities among OECD countries* in terms of energy use per unit of GDP. The economy is about 80% dependent on imported energy (imported oil, natural gas, coal and electricity). In 1999 Italy imported 95% of its oil. It bought 40% of its gas from Algeria and 28% from Russia, while 26% was of domestic origin; 15% of its electricity was imported from France and Switzerland. A moratorium on nuclear energy production (based on a 1987 referendum) triggered the dismantling of Italy's nuclear industry. Domestic energy sources consist of natural gas, some oil, hydropower, and geothermal energy. In 1999 renewables contributed 4.1% of total energy supply (Annex I.B).

Plans to combat climate change

The Inter-Ministerial Committee for Economic Planning (CIPE), chaired by the Ministry of Economy and Finance (MEF), takes all key decisions on Italy's climate change policy and approves all associated initiatives. An *Inter-Ministerial Working Group*, chaired by the Ministry of the Environment and Land Protection (MATT), was established in 1997 to co-ordinate climate change policies.

Italy's current climate change policy is based on a programme of measures to mitigate climate change approved by CIPE in 1997 and adopted by the government at the end of 1998. This 1997 programme addresses all six major GHGs. It is aimed at further strengthening the first programme and extends the time frame to 2010. According to the 1998 EU burden sharing agreement (the "EU bubble"), Italy agreed to *reduce its GHG emissions by 6.5% by 2008-12 compared with 1990 levels*. In absolute terms, it must reduce GHG emissions by 35.3 Mt CO₂ equivalents by 2010 relative to 1990 emissions. This is based on four main criteria: compliance with the EU environmental directives and regulations, identification of cost-efficient measures (taking into account secondary environmental benefits), reduction of environmentally harmful fossil fuel subsidies and taxes, and promotion of international economic and technological co-operation. The 1997 programme also outlined six domestic actions for reduction of domestic GHG emissions:

- increase energy efficiency of thermoelectric power generation;
- reduce fuel consumption for transport (Chapter 8);
- reduce energy consumption in industry, services and households;
- increase use of renewable energy sources;
- reduce emissions in the non-energy sector;
- increase forest cover (CO₂ absorption by forests).

These actions were to be implemented gradually, according to more specific policies and measures. *Reduction targets* have been designated for each action (expressed in Mt CO₂ equivalents), to be met by 2002, 2006 and 2008-12. Total GHG emission reductions achieved by the programme have been expected to be 20-25 Mt CO₂ equivalents in 2002, 45-55 Mt CO₂ equivalents in 2006, and (when fully implemented in 2008-12) 95-112 Mt CO₂ equivalents. Estimated total investment costs range between EUR 45 and 53 billion. Savings produced by implementing the programme have been estimated at between EUR 37.5 and 44.5 billion.

Scientific research and public reporting on the impacts of climate change got off to a late start. This is somewhat surprising in view of the potential impacts of climate change on Italian agriculture, tourism, water resources, biodiversity and the economy in general.

Implementation of climate change policy

It was anticipated that *implementation of the 1997 mitigation programme* would be mainly voluntary and accompanied by economic incentives, rather than focusing on regulatory measures. The intention was to identify and adopt "no regrets" and "low regrets" options, and to integrate them partly with the EU's Common and Co-ordinated Policies and Measures.

In 1999 and 2000, however, the government introduced policies and measures making use of a broader *spectrum of instruments*. Published in the form of a number of government white papers or programmes, they included regulatory measures, market-oriented actions and fiscal incentives (e.g. a carbon tax) (Chapter 6). The government has announced that it plans to expand use of the carbon tax in 2002 to CO₂ emissions from all sources. However, there are no plans to eliminate the numerous tax exemptions. The government wants to achieve a considerable share of Italy's Kyoto target through using forest sinks and flexible mechanisms (i.e. emission trading, joint implementation and clean development mechanisms). High expectations regarding use of flexible mechanisms should not hamper use of domestic policies and measures.

MATT, the Ministry of Productive Activity and some major industrial groups and companies signed *voluntary agreements on GHG reductions* in the period 1998-2000. This involved the mining and oil industries association, the national electric power utility ENEL, Fiat, Pirelli and the chemical company Montedison. Despite these efforts, the government has done relatively little to support and implement actions that would enable Italy to meet its GHG reduction target, either through implementing specific policies and measures or promoting use of the Kyoto mechanisms.

There are plans to increase energy efficiency at thermoelectric power plants to cover 20% of GHG reduction target. Switching to natural gas supports diversification of fuel impacts in electricity production, as well as increased energy and carbon efficiency. However, it does not improve Italy's low self-sufficiency with respect to energy sources. The potential of domestic *renewable energy* sources has not been fully explored, though they should cover another 20% of Italy's Kyoto target. Public R&D funding on renewables has decreased. Beginning in 2002, large electricity providers will be required to generate or purchase "green certificates" to prove that at least 2% of their supply is produced from renewable sources (wind, biomass, mini-hydropower or geothermal). These certificates are intended to be in effect for eight years. The goal is to increase reliance on renewables by 2012 by 100%; other domestic and EU efforts could stimulate a greater increase.

The government recently took steps to improve *energy efficiency measures* in the end-use sector, which is to provide 26% of GHG reductions according to the 1997 climate change mitigation programme. In early 2001 implementation decrees were issued specifying quantitative national objectives for energy savings by 2006, split roughly equally between the electricity distribution and natural gas sectors. Tightening the efficiency provisions of building codes and incorporating the EU directives on labelling for highly efficient appliances into domestic legislation have not yet been completed. Notably insufficient (or missing) are policies and measures to address energy efficiency and pollutant emission reduction (not just reduction of GHG

emissions) in the transport sector. Integrated environmental and transport policies that discourage use of private vehicles and road transport of goods should be designed and put in place: both the global climate and the health of Italian citizens would greatly benefit.

Outlooks for meeting the Kyoto target

Italy submitted *two national communications* under the UNFCCC in 1995 and 1999. The 1997 Programme of Measures to Implement a National Programme for Mitigation of Climate Change was included in Italy's second National Communication. The Kyoto Protocol was ratified by Italy in May 2002.

According to a recent study commissioned by the National Environmental Protection Agency (ANPA) on GHG emission projections, Italy could have serious problems reaching its Kyoto target by 2010. The gap between various alternative scenarios (taking into account currently implemented policies and measures) and the Kyoto target ranges between 66 Mt and 96 Mt CO₂ equivalents, or between 11.5 and 17.5% of 1990 emissions as reported in the second National Communication. The "best estimate" scenario, representing the most likely developments, indicates emissions of 624 Mt CO₂ equivalents by 2010, meaning the *Kyoto target would be exceeded by 13.2%*. The "best estimate" scenario takes into account increases in electricity consumption and transport, but also use of more effective policies and measures. ANPA recently updated the figures on Italian GHG emissions, concluding that 1990 emissions were 5% less than those reported in the second National Communication.

Further progress towards Italy's Kyoto target between now and 2010 may require, inter alia:

- curbing increases in CO₂ emissions from *transport* (Figure 9.1);
- rapid and specific government decisions, programmes and funding to promote use of *flexible mechanisms*;
- development and implementation of policies on GHGs other than CO₂, especially the "*new*" gases (HFCs, PFCs and SF₆).

1.2 Protecting the ozone layer

Italy ratified the 1985 Vienna Convention on the Protection of the Ozone Layer and the 1987 Montreal Protocol. It contributes to the *Multilateral Fund for the Implementation of the Montreal Protocol*.

Italy is implementing the Montreal Protocol through the 2000 EU regulation, which stipulates progressive stages for reducing sales and use of *ODS* in general; it also prohibits placing *chlorofluorocarbons* (CFCs) on the market or using them after 1 October 2000. Italy is still producing CFCs for the exempted uses mentioned in the Protocol.

Italy has established a relatively well functioning halon recovery and banking system based on voluntary agreements with industry. According to the 2000 EU regulation, using *methyl bromide* or placing it on the market after 2004 are prohibited (production and import are prohibited by the end of 2005). This is a challenge for Italy, which used about 13% of the world's methyl bromide in 1996. It is the second largest user (together with Japan) after the United States. Methyl bromide is a fumigant used to treat fruits, vegetables and flowers, soil intended for their cultivation, and storerooms. Italy has made great efforts to develop alternative soil fumigation technologies that are less harmful to human health and the environment. These technologies have also been successfully exported or transferred to China and India, as well as a number of Balkan and North African countries.

1.3 Transboundary air pollution

Italy is a party to the 1979 Geneva *Convention on Long-Range Transboundary Air Pollution* (LRTAP) and has ratified most of the subsequent LRTAP Protocols. Transboundary air pollution is of particular concern in Italy. In 1997 acidifying sulphur and nitrogen depositions amounted to 389 000 and 459 000 tonnes, respectively. Compared with 1990, nitrogen depositions increased by 20% and sulphur depositions decreased by 1%. Emissions of SO_x (74%), NO_x (69%) and NH₃ (44%) are exported; 48% of SO_x, 44% of NO_x and 10% of NH₃ deposited in Italy are of foreign origin.

Sulphur oxides

Under the *Helsinki and Oslo Protocols*, Italy committed to reducing national SO_x emissions by 30% between 1980 and 1993 and by 65% between 1980 and 2000. Both targets have largely been met; there has been an overall 76% reduction since 1980. Under the 1999 Gothenburg Protocol, which it has signed but not yet ratified, Italy committed to additional SO_x emission reductions of 70% between 1990 and 2010. Given the 46% decrease already achieved during the 1990s (Table 9.3), Italy is on its way to reaching this ambitious target (Chapter 2).

Nitrogen oxides

Under the *Sofia Protocol*, Italy committed to reducing national emissions of NO_x to 1987 levels by 1994. There was a strong increase in NO_x emissions up to 1992, and Italy did not meet the 30% reduction target under the Sofia Declaration (Table 9.3). Since 1992 Italy's performance in reducing NO_x has improved considerably, but meeting its commitment (48% between 1990 and 2010) under the Gothenburg Protocol remains a challenge (Chapter 2).

Volatile organic compounds

Italy was unable to fully meet its VOC emission reduction target under the 1991 *Geneva Protocol*. There was a 24% decrease in emissions between 1990 and 1999, mainly due to reduced use of solvents and other products. However, the 30% target was not met (Table 9.3). Italy's envisaged target under the Gothenburg Protocol is quite ambitious, requiring a reduction of 48% between 1990 and 2010 (a doubling of previous reductions) (Chapter 2).

Table 9.3 **Italy's performance under the Convention on Long-range Transboundary Air Pollution^a**

	Protocol		Commitments		Results	
			Target period	Target (%)	Observed period	Observed change (%)
Sulphur dioxide (SO ₂)	Helsinki	(1985)	1980-93	-30	1980-93	-64
	Oslo	(1994)	1980-2000	-65	1980-99	-76
	Gothenburg ^b	(1999)	1990-2010	-70	1990-99	-46
Nitrogen oxides (NO _x)	Sofia	(1988)	1987-94	0 ^c	1987-94	+1
	Sofia Declaration	(1988)	1986-98	-30	1986-98	-7
	Gothenburg ^b	(1999)	1990-2010	-48	1990-99	24
Volatile organic compounds (NMVOCs)	Geneva	(1991)	1990-99	-30	1990-99	-10
	Gothenburg ^b	(1999)	1990-2010	-48	1990-99	-10
Ammonia (NH ₃)	Gothenburg ^b	(1999)	1990-2010	-10	1990-99	+2
Heavy metals	Aarhus ^b	(1998)				
Cadmium			1990 cap ^d	0 ^c	1990-94	-44
Lead			1990 cap ^d	0 ^c	1990-99	-68
Mercury			1990 cap ^d	0 ^c	1990-94	-34
POPs	Aarhus ^b	(1998)				
PAHs			1990 cap ^d	0 ^c	1990-99	..
Dioxins/furans			1990 cap ^d	0 ^c	1990-99	-50
Hexachlorobenzene			1990 cap ^d	0 ^c	1990-99	..

a) 1979 Geneva Convention.

b) Signed but not yet ratified.

c) The target is to stabilise emissions at the reference year level.

d) Reference year is not definitive.

Source: ANPA.

POPs and heavy metals

Italy has signed but not yet ratified the two 1998 *Aarhus Protocols* on persistent organic pollutants (POPs) and heavy metals. Between 1990 and 1999 it made exceptional progress, reducing dioxin and furan emissions by 50%. Significant reductions have also been achieved for emissions of several heavy metals such as lead, cadmium and mercury (Table 9.3). Pertinent data are still incomplete.

1.4 Marine pollution

Italy has a 7 500 km coastline. Its marine environment is subject to *environmental pressures* from land-based sources, maritime transport and offshore fishing. One-third of the Italian population lives in coastal areas where population density is twice as high as the national average.

Pollution from land-based sources

Although bathing water quality has remained high, coastal waters continue to be affected by *agricultural effluents (eutrophication), industrial effluents (hot spots) and untreated urban waste water* from rivers or coastal cities (Chapter 3). In these three areas too little progress has been made.

Eutrophication in coastal waters caused by anthropogenic nitrogen inputs (mainly from agriculture) remains a problem, particularly in the Emilia-Romana, Veneto and Lazio regions. Eutrophication leads to excessive algae production and damage to coastal ecosystems. This is mainly due to the nutrient loads carried by the Po and Adige rivers to the Adriatic, and by the Tiber to the upper Tyrrhenian Sea. In the mid 1990s total nitrogen discharges from Italy to the northern Adriatic amounted to some 270 000 tonnes per year. Nutrients from extensive and increasing aquaculture in coastal lagoons along the northern Adriatic coast contribute to eutrophication.

In 1976 Italy signed the *Barcelona Convention*, ratifying it in 1979. It is also a member of the *Mediterranean Action Programme* (MAP), which is made up of 21 countries that co-ordinate their efforts to protect the Mediterranean Sea. The Barcelona Convention, with its six Protocols, constitutes the MAP's legal framework. In 1999 Italy ratified the amended LBS Protocol, aimed at protecting the marine environment from pollution from land-based sources. The Programme for the Assessment and Control of Pollution in the Mediterranean region (MEDPOL) was established to implement the LBS Protocol. A Strategic Action Programme (SAP) has recently been set up to tackle and eliminate pollution from land-based sources. This programme is aimed at phasing out inputs of toxic, persistent or bioaccumulating substances in the Mediterranean, e.g. by designating hot spots and sensitive areas. Italy has 15 hot spots and seven areas especially sensitive to pollution, mostly related to industry, port or

refinery infrastructure; estimated remediation costs are EUR 1 billion for investment in waste water treatment infrastructure, port infrastructure and monitoring. The SAP also includes commitment to “safe disposal” of sewage from cities with over 100 000 population by 2005. By 1999 only six of the 22 relevant Italian cities met this requirement, and some 7 million m³ of untreated waste water per day was being discharged to the sea. Major investment will be necessary for remediation of polluted sites and construction of waste water treatment facilities.

Monitoring of coastal and marine water quality in 14 Italian regions is carried out on the local, regional and national levels; MATT co-ordinates the work of ANPA, the Regional Environmental Protection Agencies (ARPAs) and the Central Institute for Applied Marine Research (ICRAM). In addition, 19 000 controls on coastal water quality are carried out every year during the bathing season (the “Mare Pulito” programme) by the Operational Unit for Environmental Protection of the Carabinieri (NOE). Monitoring and reporting on the state of the Mediterranean needs to be further strengthened to better prioritise actions and support cost-effective decisions on pollution prevention and control.

Pollution from offshore sources

During the 1990s the amount of cargo treated in Italian ports increased significantly. It now totals some 320 million tonnes per year, including 5 million tonnes of chemical products. In the same period the Italian *merchant fleet* grew by 16% (number of vessels); Italy currently ranks fifth among OECD countries in number of merchant vessels.

Italy is a party to the *London Dumping Convention*, but it has not yet ratified its much stricter 1996 Protocol. Dumping of waste at sea has been illegal in Italy since 1980. No major violations were reported during the 1990s.

Having ratified the *Barcelona Convention* and most of its Protocols, Italy is committed to protect the marine environment from both dumping and incineration at sea. It has not yet ratified the Offshore Protocol or the Hazardous Waste Protocol.

Oil spill prevention, emergency response and compensation

Some 41% of oil transport in the Mediterranean makes use of Italian harbours. The most important (Trieste, Augusta and Genoa) represent around 50% of total shipping. Oil tankers account for 20% of the Italian fleet above 100 tonnes (gross tonnage). No major oil spills have been recorded along the Italian coast since a 1991 spill, due to an accident involving the tanker Haven, and the Agip Abruzzo fire. However, as Italy is heavily dependent on oil imports and has a number of refineries along its coast, there is a *continual risk of oil spills and maritime accidents*. Progress has been made on oil spill prevention and response preparedness, but further reinforcement is needed.

Italy has implemented recent EU directives concerning minimum requirements for *vessels carrying dangerous or polluting goods* and the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78), with the exception of Annex VI (1997) and the 1999 and 2000 amendments. To limit oil pollution, discharges of any hydrocarbons at sea by ships under the Italian flag are prohibited (a stricter requirement than that of MARPOL). In 1993 France and Italy agreed to close the Strait of Bonifacio (between Corsica and Sardinia) to ships carrying dangerous substances, but some 5 000 per year still enter it under other national flags. Most of these ships are serving Italian industries.

In 1998 Italy ratified the 1990 *Convention on Oil Pollution Preparedness, Response and co-operation (OPRC)*. It subsequently improved its capacity to deal with pollution incidents, either nationally or in co-operation with other countries. This delay in ratification can be explained by the significant upgrading of a previously insufficient national emergency and response system in 1998. MATT now has responsibility for combating oil spills. Since 1999 the Central Service of Sea Defence co-ordinates response; through its contract with a private company (Castalia Ecolmar), 61 anti-pollution vessels patrol the Italian coastline and ten offshore vessels operate on the high seas, a scheme costing EUR 27.5 million per year. The 48 harbour master offices, which are part of the Coast Guard, control and co-ordinate operations in their particular area. The Italian Navy also operates four patrol boats of 1 500 tonnes which are able to undertake clean-up operations offshore.

Between 1993 and 2000 MATT carried out 440 interventions related to *marine pollution* (Table 9.4); 88% were responses to spills of hydrocarbons, petrochemical products and hazardous substances. Since 1999 MATT has been the only authority responsible for oil spill response. The number of pollution events handled by MATT has increased, but the rate of identification of those responsible for the pollution has significantly decreased. In most cases the authorities have not been able to apply the polluter-pays principle and to charge polluters for reclamation operations.

Ratification of the two 1992 protocols on *international liability and compensation* for oil spill damage, as recommended by OECD in 1994, was an important step towards better implementation of the polluter-pays principle. These protocols ensure better compensation through higher and uniform ceilings applicable to all parties to the Convention. Furthermore, Italy has recently signed the Bunker Oil Convention ensuring compensation to persons who suffer damage caused by oil spills when the oil is carried as fuel in ships' bunkers. The government plans to ratify and implement this Convention as rapidly as possible.

In 1995 Italy ratified the 1989 *International Convention on Salvage*, which entered into force in 1996. It replaced the 1910 Convention on the Law of Salvage. The 1989

Convention provides for a greater salvage reward, taking into account the salvors' skills and efforts to prevent or minimise environmental damage. The Convention allows special compensation to be paid to salvors who do not earn a reward for salvaging the ship and the cargo, but have taken measures to protect the environment.

Table 9.4 **Emergency anti-pollution operations in territorial waters, 1993-2000**

	Events			Causes		Operations
	Oil-related ^a (number)	Other ^b (number)	Origin known (%)	Non-navigational ^c (number)	Navigational ^d (number)	(number)
1993	69	2	43	63	8	71
1994	58	8	64	53	13	66
1996	8	–	50	5	2	8
1997	40	8	40	5	43	48
1998	27	3	59	4	30	30
1999	55	17	6	2	70	72
2000	130	15	5	2	143	145
Total	387	53		134	309	440

a) Spills at sea of mixtures of hydrocarbons, petrochemicals and hazardous substances.

b) Spills at sea of other substances than those indicated in a).

c) Principal cause not strictly linked to navigation (e.g. engine failure or errors in use of on-board equipment, oil terminals or land-based plants).

d) Principal cause related to navigation (e.g. collisions, fires, vessels aground).

Source: MATT.

Accidental maritime pollution and ship safety

Italy intends to follow the new MARPOL *phase-out timetable for single-hulled tankers*. Members of Confindustria (the Italian confederation of industries) have agreed not to own, operate or charter pre-MARPOL (i.e. pre-1982) crude oil tankers after 2003 or pre-MARPOL petroleum product carriers after 2005 (instead of 2006 and 2015, respectively, as in the previous MARPOL timetable). As 29% of all vessels (including fishing vessels with metallic hulls) are over 30 years old, this will require substantial conversion of the Italian fleet.

In June 2001 MATT, the Ministry of Infrastructure and Transport (MIT), Confindustria, the association of ports (Assoporti), environmental organisations and trade unions signed a *voluntary agreement* to achieve higher environmental safety standards for transport of hazardous substances. The agreement includes several measures:

anticipation of the phase-out of pre-MARPOL tankers; closure of the Strait of Bonifacio to MARPOL I and II ships; an increase in the number of conformity checks; increased security measures for the Venice lagoon; and prevention of discharges to the sea from cleaning of tanks. Implementation of this agreement would represent an important contribution to pollution prevention.

Under the authority of MATT, the Coast Guard (Capitanerie di Porto) is responsible for controls on ship safety, as well as for marine water quality, waste management and nature conservation issues. Before 1999 these were under MIT. The Coast Guard also implements the 1980 Paris *Memorandum of Understanding on Port State Control* requiring that at least 25% of vessels be checked for compliance with MARPOL standards. Italy was not meeting this target at the beginning of the 1990s, but the rate of inspections increased over the decade. In 2000 it reached 36%; deficiencies were detected during 52.7% of inspections and 13.5% of inspected vessels were detained.

1.5 Living marine resources

Protection of the Mediterranean Sea under the Barcelona Convention

Italy strongly supports the *Barcelona Convention*. It takes part in the Mediterranean Action Programme (MAP II) as well as of the Mediterranean Commission on Sustainable development (MCSD). In 1999 Italy ratified the amendments to the Barcelona Convention, which became the Convention for the Protection of the Marine Environment and the Coastal Regions of the Mediterranean. The Convention now focuses not only on marine pollution but also on living marine resources.

The *Specially Protected Areas and Biodiversity Protocol* to the Barcelona Convention calls notably for the establishment of a list of Specially Protected Areas of Mediterranean Importance (SPAMI) in order to conserve biodiversity and specific Mediterranean ecosystems. Related measures include protection and conservation of species, regulation of the introduction of non-indigenous or genetically modified species, and the improvement of scientific, technical and management research relevant to Specially Protected Areas. This Protocol includes a provisional list of 104 species protected in the Mediterranean. In 1999 ICRAM launched a three-year research programme on conservation of marine species in Italy; four animal groups (cetaceans, the monk seal, marine tortoises and cartilaginous fish species) were selected during the first year.

Within the *MEDPOL III programme* Italy has actively promoted culture and technology aimed at prevention, monitoring and control of pollution from land-based sources. This programme deals particularly with the Balkan area and southern Mediterranean basin.

Italy has also joined the *Short and Medium-term Priority Environmental Action Programme* (SMAP) adopted in 1997 by the Euro-Mediterranean Ministerial Conference within the framework of the Euro-Mediterranean Partnership. SMAP focuses on integrated management of waters, waste management, integrated coastal zone management, desertification and environmental hot spots.

The marine sanctuary

Since 1976 Italy, France and Monaco have co-operated to improve *protection of coastal waters in the area between St. Raphael and Genoa* (RAMOGE Agreement). In 1993 this co-operation was extended to cover the area between Fos and La Spezia, and a joint pollution emergency plan (RAMOGEPOL) was adopted. Extension of the RAMOGE Agreement to cover shipping security issues is envisaged.

In 1993 *Italy, France and Monaco* also agreed to work towards creating a marine sanctuary between Corsica, Sardinia, Liguria and Provence within the framework of the RAMOGE agreement. Italy ratified in 2001 the agreement that had been signed in Rome in November 1999. It establishes a sanctuary extending to 100 000 km², surrounding all of Corsica and including the Strait of Bonifacio. Around 25 000 dolphins and 1 000 whales (the striped dolphin, finback whale, sperm whale, long-finned pilot whale, Risso's dolphin, bottlenosed dolphin, common dolphin and Cuvier's beaked whale) live in this area. The three countries agreed to foster measures to protect marine fauna. Driftnet fishing and capture of cetaceans are currently prohibited only for vessels from signatory countries. To extend these protection measures so that they will be binding on other countries, it has been suggested that the sanctuary be recognised by the United Nations Environment Programme (UNEP) under the Protocol on specially protected areas of the Barcelona Convention.

Fisheries

Since 1990 *Italian fish catches* in the Mediterranean have declined (Table 9.5). However, total catches of the three most important fishes (anchovy, Mediterranean mussel and striped venus) have increased since that year by 178%, 29% and 36%, respectively (Table 9.6). Due to lack of scientific analysis of important fish stocks in the Mediterranean, evaluations can be based on only a few studies. In the case of fishes for which Italy is one of the main fishing countries, Mediterranean stocks are mostly fully exploited (with no room for further expansion), overexploited or even depleted. Since 1994 exploitation of relevant stocks has worsened for the Atlantic bonito, anchovy, gilthead sea bream and swordfish; none is showing signs of recovery (Table 9.6). The General Fishery Council for the Mediterranean (GFCM) has reported very high exploitation rates for red and striped mullet in Italian waters, with

Table 9.5 **Total Italian fish catches in the Mediterranean Sea, 1980-99**
(tonnes)

	1980	1990	1995	1999	Change 1999-90 (%)
Crustaceans	15 902	31 438	23 613	16 888	-47.5
Diadromous fishes	1 721	799	616	362	-53.8
Marine fishes	269 907	185 989	252 365	158 910	-20.7
Molluscs	70 599	94 065	99 376	99 824	2.5
Total	358 129	312 291	375 970	275 984	-16.6

Source: FAO.

Table 9.6 **Selected Italian fish catches in the Mediterranean Sea,^a 1980-98**

	Catches (tonnes)				Change 1990-98 (%)	State of exploitation	
	1980	1990	1994	1998		1994 ^b	1998 ^b
Albacore	500	1 191	..	1 414	..	D	F-D
Atlantic bonito	1 180	1 244	1 828	2 121	70	F-O	F-D
Bogue	7 518	4 372	4 457	4 074	-7	M-F	M-F
Common sole	3 382	4 007	4 097	1 907	-52	F	F
Common squids	4 558	4 743	5 282	2 237	-53	F	F
Deepwater rose shrimp	6 562	20 922	11 262	4 410	-79	M-F	M-F
European anchovy	79 282	15 993	30 840	44 429	178	F-M	F-(D)
European hake	11 378	20 473	36 334	13 166	-36	F-O	F-O
European pilchard (sardine)	47 712	37 737	29 679	36 387	-4	M-F	M
Gilthead sea bream	1 016	1 022	3 086	1 717	68	F	F-O
Jack and horse mackerels	7 560	6 702	6 164	6 314	-6	M	M
(Grey) mullets	6 412	4 832	4 991	5 344	11	M-O	M-F
Northern bluefin tuna	6 272	4 110	6 882	4 059	-1	D	D
Striped venus	29 336	21 174	19 255	28 830	36	F-O	F-O
Surmullets (red mullets)	8 134	9 713	9 921	7 491	-23	F-O	M-F
Swordfish	4 143	5 524	7 765	6 104	10	F-O	O

a) Stocks, species or groups of species for which Italy is one of the main fishing countries.

b) M: moderately exploited; exploited with a low level of fishing effort; some limited potential for expansion. F: fully exploited; the fishery operates at or close to an optimal yield level; no room for further expansion. O: overexploited; the fishery is being exploited above the level believed to be sustainable in the long term; high risk of stock depletion. D: depleted.

Source: FAO.

over-exploitation especially in the Adriatic. As Italian catches of these fishes remain high compared with other Mediterranean countries, further evaluation of stocks and management of fishery resources is needed to prevent overexploitation.

The *rationalisation plan for tuna fishing in Italy* was initiated in 1999, when fishing of red tuna was subject to temporary suspension for the first time with respect to this type of fish. The 2000 and 2001 European total allowable catch (TAC) quotas were established for Italy only in the case of bluefin tuna; both quotas were above 1998 total catch. The GFCM has adopted International Commission for the Conservation of Atlantic Tuna (ICCAT) regulations on bluefin tuna fisheries, to apply to all member GFCM countries including Italy. The Italian Environmental Strategy for Sustainable Development has set the target for percentage of juvenile fish to be released (from those captured below a minimum size) at 50% above the ICCAT norms. A management consortium carries out resource management of bivalve molluscs with considerable authority regarding monitoring of fishing activities and maximum catch levels.

In 2000 the *Italian fishing fleet* consisted of 17 600 vessels with a gross tonnage of 230 000 tonnes. The fleet's main characteristics are the predominance of small vessels (around 90% of total vessels have less than 25 tonnes of gross tonnage), wide distribution of the fleet along the coastline and high use of polyvalent techniques. The EU aims to reduce the size of the European fleet through Multiannual Guidance Programmes (MAGPs). However, the number of vessels in the Italian fishing fleet has grown during the last decade though gross tonnage has declined (less than the intermediate objective in 2000 for reduction of gross tonnage under MAP IV). Italy's Environmental Strategy for Sustainable Development includes the target of reducing the size of the fishing fleet (-7% by the end of 2001). During the period 1994-99 Italy received a total of EUR 159 million in EU funds to support its fisheries sector. Another EUR 118 million was allocated through national funding.

Use of driftnets longer than 2 500 metres has been forbidden in the Mediterranean since 1992, under a United Nations moratorium and EU regulation; their use by some Italian vessels is said to continue in parts of the Mediterranean. In 1997 a plan for rationalisation and reconversion of spadars (e.g. boats that use driftnets to capture swordfish) was finalised to protect marine mammals as well as maintaining swordfish stocks. With EU financial assistance, the plan offers strong incentives for fishermen and ship owners to use other fishing methods (on a voluntary basis) or seek another type of employment, together with a retirement plan. EUR 120 million was allocated between 1997 and 1999, 50% from the EU (FIGF). The EU Council of Ministers has banned use of driftnets to capture tuna in the Mediterranean from 1 January 2002; a gradual phase-out of driftnet use is envisaged as restructuring of the Italian fleet proceeds. The Environmental Strategy for Sustainable Development includes the target of phasing out spadars by the end of 2001.

1.6 Development co-operation

The relative amount of Italian *official development assistance (ODA)* has been modest and decreasing, especially in the late 1990s (Figure 9.2). ODA was 0.15% of GNP in 1999 and 0.13% (EUR 1.5 billion) in 2000. This is below the OECD/DAC (Development Assistance Committee) average and far below the 0.7% Rio commitment. Italy's ODA per capita is also among the lowest in OECD Europe (Annex I.C). Italy is the fifth most important donor of ODA expressed in absolute terms. In the economic and financial plan for the years 2002-06, the Rio commitment (0.7% of GNP) has been reaffirmed; however, ODA in 2002 is only EUR 1 033 billion, less than in 2000. Roughly two-thirds of this amount goes to multilateral and one-third to bilateral co-operation. About 80% of Italian ODA projects in 1999-2001 were focused on some 15 countries (southern and eastern Mediterranean basin, Horn of Africa, southern Africa, China and India). In particular, there has been extensive environmental co-operation with China. Italy plans EUR 6 billion in debt relief over three years for highly indebted poor countries.

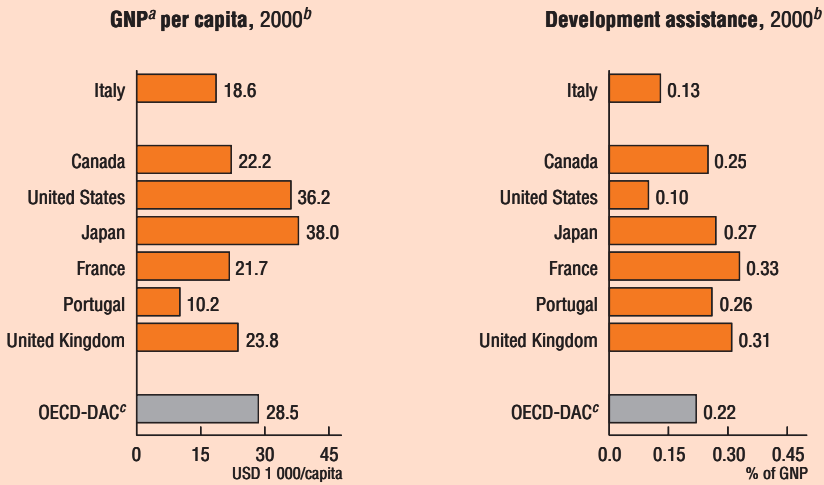
Progress has been made in the aid management area (including project quality control) since a major process of *reform of Italian development co-operation* began in 1996. The latest OECD Development co-operation Review of Italy concludes that further strengthening of the management structure and capacities of development co-operation is urgent. A new law embodying such a reform has passed the Senate and is pending in the Chamber of Deputies.

Environmental aid is not well identified or well measured in Italy. This type of aid remains small and should be increased (particularly for south-eastern European and southern and south-western Mediterranean countries), notwithstanding Italy's efforts to improve its public finances. The Mediterranean Action Programme provides a framework for focusing aid on hot spots, sensitive areas and coastal municipal waste water treatment. Use of environmental impact assessment for non-environmental projects should be strengthened.

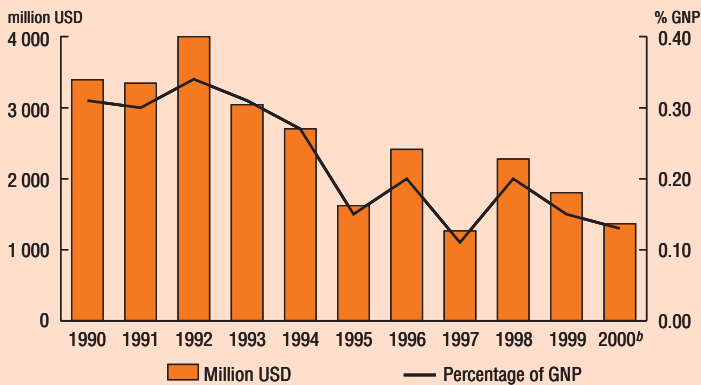
1.7 Implementation of EU environmental legislation

The previous Environmental Performance Review of Italy noted that it was the EU Member State that provided the least information to the Commission on implementation of EU environmental legislation in 1992. Italy was then involved in a number of procedures concerning breaches of EU legislation in the environmental protection area. This problem was associated with the central government's limited competence to control the *conformity of regional legislation with EU legislation*, and with the different degree of implementation of laws and regulations among regions. Today the situation has improved, and Italy's record with respect to implementation of EU environmental

Figure 9.2 Official development assistance



Trends in Italian ODA, 1990-2000



a) GNP in USD at current exchange rates.

b) Provisional data.

c) 22 member countries of the OECD Development Assistance Committee.

Source: OECD-DAC.

legislation does not currently stand out from that of the other Member States. By the end of 2001 Italy had implemented 91.73% of EU environmental directives, slightly better than the average (91.45%). Most recent Italian cases concerning infringement of EU legislation are related to the internal market and the environment.

In the late 1990s several *EU court rulings* were made against Italy for failure to transpose directives or for infringing EU legislation in environmentally related matters. They involved environmental impact assessment (Annex II of the directive 85/337, as amended), reduction of pollution from dangerous substances discharged to the aquatic environment (76/464 and related directives), treatment of urban waste water (91/271), conservation of wild birds (79/409) and the framework directive on waste (75/442). Complying with EU air quality standards (concentration of pollutants in air) is a continuous problem in some urban environments.

2. Focus on Selected Topics

2.1 International agreements

Italy has adhered to most relevant international or regional multilateral environmental agreements (Annexes II.A and II.B). *Some agreements have not yet been signed by Italy*, including:

- the 1996 London Protocol to the Convention on Prevention of Marine Pollution by Dumping of Waste and Other Matter (London, Mexico, Moscow and Washington, 1972);
- the 1991 London Agreement on Conservation of Bats in Europe to the Convention on Conservation of Migratory Species of Wild Animals (Bonn, 1979);
- the 1991 Geneva Amendments to the Convention on New Varieties of Plants (Geneva, 1972) (these amendments are related to the issue on genetically modified organisms);
- the 1997 London Annex on Prevention of Air Pollution from Ships (Annex VI) to the Protocol on Prevention of Pollution from Ships (MARPOL Protocol, London, 1978);
- Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by the Sea (London, 1996).

Some multilateral environmental agreements have been signed by Italy but *not yet ratified*. These include:

- the 1996 Agreement on Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS, Monaco);

- the two 1998 Aarhus Protocols (on heavy metals and persistent organic pollutants) to the Convention on Long-range Transboundary Air Pollution (LRTAP, Geneva, 1979);
- the 1999 Gothenburg Protocol (acidification, eutrophication and ground level ozone) to the LRTAP;
- the 1992 European Convention on Protection of the Archaeological Heritage (La Valette).

Italy contributes to the *funding of the secretariats* of international environmental agreements or to institutions supporting environmental protection in developing countries (e.g. the Trust Fund of the Montreal Protocol, UNEP, UNFCCC, the Intergovernmental Scientific Panel on Climate Change, the Global Environment Facility, the Mediterranean Action Plan and the Trust Fund of the Asian Development Bank).

2.2 Regional co-operation

Beyond bilateral co-operation with neighbouring countries and southern Mediterranean countries, as well as co-operation within the Mediterranean region (including the Adriatic basin), Italy developed specific regional co-operation programmes during the 1990s.

South Eastern Europe

A Trilateral Joint Commission for the *protection of the northern Adriatic Sea and coastal areas* (ASEP) has been established with Croatia and Slovenia. Among the Commission's main activities are development of the Adriatic Master Plan, which emphasises integration of environmental and economic aspects into tourism policies; monitoring of northern Adriatic waters; co-operation on anti-pollution emergency interventions; and declaring the Adriatic a sensitive area to be protected. Other projects include the Co-ordinated Adriatic Observing System (CAOS) project, as well as the pilot project on the Adriatic Sea Integrated Coastal Area and River Basin Management System (ADRICOSM) to define pollution prevention methods in this area of rapid economic development and high environmental pressure.

In line with the 2000 Ancona Declaration, the Italian government launched the *Adriatic-Ionian Initiative*, which is closely related to the Stability Pact for South Eastern Europe. This initiative embraces political and economical stability, environmental protection, sustainable development, crime, human rights and democratic freedoms as areas of co-operation. One of the initiative's longer-term objectives is creation of an Adriatic-Ionian Council.

Central and Eastern Europe

Italy has participated in *joint assessment of environmental and health risks* following serious industrial accidents and when remediating old industrial sites. Most Italian funding has been directed to Bulgaria, Hungary, Romania and Ukraine, partly through a trust fund within the Regional Environmental Centre for Central and Eastern Europe (REC), and has been used, for instance, to carry out point source pollution management as well as environmental risk assessments in the Danube delta and along the Black Sea coastline.

Alpine co-operation

In 1999 Italy ratified the *Alpine Convention*. An area of 52 653 km² (27.6% of Italian territory) is covered by this Convention. Nine Protocols are aimed at ensuring protection (and sustainable and environmentally sound development) of the Alpine region. Like most other Alpine countries, Italy has signed but not ratified the completed Protocols, which concern agriculture, tourism, nature conservation, forestry, energy and transport.

Italy co-operates with neighbouring Alpine countries within the framework of the *Working Community of States and Regions of the Eastern Alpine Regions* (Alpe Adria). In 1978, in a joint declaration, 19 Alpine regions (of which four, Friuli-Venezia Giulia, the Veneto, Lombardy and Trentino-Alto Adige, are Italian) indicated their willingness to share information and co-operate on issues of common interest. The main fields of co-operation are transalpine traffic, ports, energy generation, agriculture, forestry, tourism, environmental protection and nature conservation. In 2001 the Veneto region chaired the Working Community.

Starting with a 1984 proposal from the region of Friuli-Venezia Giulia, within the Alpe Adria framework, an *Upper Adriatic Observatory* has been established to monitor marine water quality. It receives EU funding (INTERREG II) for a monitoring programme that began in 1998 (with a total project cost of EUR 1.8 million).

2.3 Drought and desertification

During the 1990s Italy became increasingly aware of its vulnerability to drought and desertification, probably in relation to climate change (Chapter 5). It is a party to the *UN Convention to Combat Desertification* (UNCCD) and has been very active among the Convention's Annex IV (northern Mediterranean) countries.

Members of the National Committee for Combating Drought and Desertification include representatives of various ministries, local authorities, the scientific community and NGOs. In 1999 Italy approved its *National Action Programme to Combat*

Drought and Desertification, which has four priority areas: soil protection, sustainable management of water resources, reducing harmful agricultural practices, and soil reclamation.

Italy is considering ways to forgive the debts of developing *countries that have experienced catastrophic drought and soil erosion*. Projects on combating drought and desertification have been financed in northern and central Africa and the Middle East; projects promoting rural sustainable development and conservation (as well as reintroducing environmentally friendly traditional knowledge in animal husbandry and farming) have been financed in the Sahel region.

ANNEXES

- I.A Selected environmental data
- I.B Selected economic data
- I.C Selected social data
- II.A Selected multilateral agreements (worldwide)
- II.B Selected multilateral agreements (regional)
- III. Selected environmental events (1994-2001)
- IV. Physical context

ANNEX I.A: SELECTED ENVIRONMENTAL DATA (1)

	CAN	MEX	USA	JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK	FIN	
LAND													
Total area (1000 km ²)	9971	1958	9364	378	99	7713	270	84	31	79	43	338	
Major protected areas (% of total area)	2	9.6	8.2	21.2	6.8	6.9	7.7	23.5	29.2	2.8	16.2	32.0	8.4
Nitrogenous fertiliser use (t/km ² of arable land)		3.9	4.8	6.3	11.2	23.4	2.1	38.0	8.7	17.7	6.3	10.6	7.2
Pesticide use (t/km ² of arable land)		0.07	0.13	0.21	1.50	1.29	0.23	0.85	0.25	0.92	0.12	0.15	-
FOREST													
Forest area (% of land area)		45.3	33.4	32.6	66.8	65.2	19.4	29.5	47.6	22.2	34.1	10.5	75.5
Use of forest resources (harvest/growth)		0.4	0.2	0.6	0.3	0.1	..	0.6	0.6	0.9	0.7	0.6	0.8
Tropical wood imports (USD/cap.)	3	1.6	0.2	2.2	10.7	6.1	4.0	3.4	0.5	24.3	0.3	3.8	1.4
THREATENED SPECIES													
Mammals (% of species known)		19.2	33.2	10.5	23.5	17.0	14.9	15.2	35.4	31.6	33.3	24.0	11.9
Birds (% of species known)		10.8	16.9	7.2	12.9	15.0	6.4	25.3	37.0	27.5	55.9	10.6	6.7
Fish (% of species known)		6.4	5.7	2.4	25.3	1.3	0.4	0.8	65.5	54.3	29.2	18.2	11.9
WATER													
Water withdrawal (% of gross annual availability)		1.7	17.4	19.9	20.8	35.6	4.3	0.6	2.7	42.5	15.6	15.7	2.2
Public waste water treatment (% of population served)		78	22	71	62	53	..	80	75	27	59	87	77
Fish catches (% of world catches)		1.1	1.3	5.1	5.6	2.3	0.2	0.6	-	-	-	1.5	0.2
AIR													
Emissions of sulphur oxides (kg/cap.)		89.7	24.5	63.3	6.7	24.7	97.0	11.6	5.7	20.1	43.0	14.5	16.5
(kg/1000 USD GDP)	4	3.7	3.3	2.0	0.3	1.8	4.2	0.7	0.2	0.9	3.4	0.6	0.8
% change (1990-late 1990s)		-19	..	-20	-5	-29	-4	20	-50	-37	-76	-65	-67
Emissions of nitrogen oxides (kg/cap.)		67.8	16.8	85.2	15.5	23.3	136.9	53.4	21.0	35.7	40.1	43.7	48.0
(kg/1000 USD GDP)	4	2.9	2.4	2.8	0.6	1.7	5.9	3.1	0.9	1.5	3.2	1.8	2.2
% change (1990-late 1990s)		-5	7	5	6	17	17	18	-11	16	-44	-18	-18
Emissions of carbon dioxide (t./cap.)	5	16.0	3.7	20.5	9.1	8.8	17.0	8.0	7.5	11.6	10.8	10.0	11.2
(t./1000 USD GDP)	4	0.63	0.47	0.64	0.38	0.58	0.71	0.45	0.32	0.49	0.86	0.40	0.50
% change (1990-1999)		16	21	15	10	76	24	33	6	12	-26	7	8
WASTE GENERATED													
Industrial waste (kg/1000 USD GDP)	4, 6	..	51	..	41	56	106	28	63	62	288	22	118
Municipal waste (kg/cap.)	7	330	320	760	410	360	690	380	550	530	330	630	460
Nuclear waste (t./Mtoe of TPES)	8	5.0	0.1	0.9	1.9	2.7	-	-	-	1.3	1.1	-	2.2
PAC EXPENDITURE (% of GDP)													
	9	1.1	0.8	1.6	1.6	1.7	0.8	..	1.7	0.9	2.0	0.9	1.1

.. not available. - nil or negligible. x data included under Belgium.

1) Data refer to the latest available year. They include provisional figures and Secretariat estimates.

Partial totals are underlined. Varying definitions can limit comparability across countries.

2) Data refer to IUCN categories I to VI; AUS, HUN, ITA, LUX, TUR: national data.

3) Total imports of cork and wood from non-OECD tropical countries.

4) GDP at 1995 prices and purchasing power parities.

Source: OECD Environmental Data Compendium.

OECD EPR / SECOND CYCLE

FRA	DEU	GRC	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	ESP	SLO	SWE	CHE	TUR	UKD*	OECD*
549	357	132	93	103	70	301	3	42	324	313	92	506	49	450	41	779	245	34777
10.1	26.9	2.6	9.1	9.5	0.9	9.1	6.5	11.6	7.6	9.4	6.6	8.4	21.6	8.1	18.0	3.8	20.4	12.4
13.7	16.7	7.4	5.6	10.2	47.0	7.9	x	34.9	11.8	5.9	4.5	6.2	4.1	6.8	12.6	5.5	20.3	6.6
0.59	0.29	0.29	0.14	..	0.25	0.78	x	1.06	0.09	0.07	0.43	0.18	0.23	0.06	0.37	0.13	<i>0.58</i>	<u>0.25</u>
31.4	30.1	22.8	18.9	1.3	8.8	23.3	34.4	9.2	39.2	29.7	37.9	32.3	42.2	73.5	31.7	26.9	10.5	33.9
0.7	0.4	0.6	0.6	-	0.6	0.3	0.5	0.6	0.5	0.6	0.8	0.5	0.5	0.7	0.5	0.4	0.7	0.5
6.8	1.8	2.8	0.1	2.8	11.2	7.1	-	15.6	3.6	0.3	17.9	6.3	0.1	2.2	0.6	0.5	2.7	4.0
20.2	36.7	37.9	71.1	-	6.5	40.7	51.6	15.6	5.9	15.5	17.3	21.2	23.3	18.2	34.2	22.2	<i>20.0</i>	..
14.3	29.2	13.0	18.8	13.3	21.8	18.4	50.0	27.1	7.7	16.6	13.7	14.1	14.3	8.6	42.6	6.7	<i>6.8</i>	..
6.6	68.2	24.3	32.1	-	33.3	31.8	27.9	82.1	-	27.1	18.6	29.4	38.3	12.7	44.7	9.9	<i>11.1</i>	..
23.9	24.4	12.1	5.0	0.1	2.6	32.2	3.4	4.9	0.7	18.7	15.3	36.8	1.4	1.5	4.9	15.2	<i>15.4</i>	<i>11.9</i>
77	89	45	22	16	61	63	88	97	73	47	55	48	49	93	94	12	84	<u>59</u>
0.6	0.3	0.1	-	1.9	0.3	0.3	-	0.6	2.8	0.3	0.2	1.3	-	0.4	-	0.6	0.9	28.5
14.2	10.1	51.4	58.5	30.6	47.4	16.0	8.4	6.4	6.7	49.1	37.6	39.2	33.2	8.0	3.9	30.0	20.0	35.0
0.8	0.5	3.7	5.7	1.2	2.1	0.8	0.2	0.3	0.3	5.9	2.5	2.5	3.3	0.4	0.1	4.7	1.0	1.8
-34	-84	7	-41	2	-4	-46	-76	-51	-44	-41	4	-28	-67	-48	-35	18	-68	135
28.1	20.0	36.4	21.9	101.4	32.2	25.8	39.6	26.0	50.5	24.6	37.0	36.4	24.1	30.2	14.8	13.2	27.1	42.1
1.3	0.9	2.6	2.1	4.1	1.4	1.2	1.1	1.1	2.0	3.0	2.4	2.2	2.4	1.4	0.6	2.1	1.3	2.0
-12	-39	17	-7	6	3	-24	-27	-29	2	-26	17	17	-43	-23	-32	26	-42	-2
6.1	10.0	7.7	5.7	7.4	10.7	7.3	17.3	10.5	8.3	8.0	6.1	6.9	7.3	5.4	5.6	2.8	9.0	11.0
0.27	0.44	0.54	0.54	0.29	0.43	0.34	0.43	0.44	0.32	0.93	0.39	0.39	0.72	0.25	0.21	0.47	0.44	0.51
-	-15	18	-14	3	24	6	-28	6	30	-11	53	29	-29	-	-3	32	-6	10
84	38	47	72	1	65	19	136	26	27	72	3	24	81	86	8	87	53	70
510	550	430	490	710	560	500	640	610	620	320	450	670	330	450	650	380	560	540
4.5	1.3	-	1.9	-	-	-	-	0.2	-	..	-	1.2	2.4	4.7	2.4	-	3.4	<u>1.5</u>
1.4	1.5	0.8	0.7	..	0.6	0.9	..	1.8	1.2	1.1	0.9	0.8	..	1.2	1.6	..	1.0	..

* UKD: pesticides and threatened species: Great Britain; water withdrawal: England and Wales.

5) CO₂ from energy use only; international marine and aviation bunkers are excluded.

6) Waste from manufacturing industries.

7) CAN, NZL: household waste only.

8) Waste from spent fuel arising in nuclear power plants, in tonnes of heavy metal, per million tonnes of oil equivalent of total primary energy supply.

9) Household expenditure excluded; HUN, POL: investments only.

ANNEX I.B: SELECTED ECONOMIC DATA (1)

	CAN	MEX	USA	JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK
GROSS DOMESTIC PRODUCT											
GDP, 2000 (billion USD at 1995 prices and PPPs)	818	814	9141	3126	774	470	71	196	254	133	137
% change (1990-2000)	30.6	41.0	38.9	14.4	80.8	42.7	29.1	24.2	23.4	-7.5	25.7
per capita, 2000 (1000 USD/cap.)	26.6	8.2	33.2	24.7	16.4	24.5	18.4	24.2	24.8	12.9	25.6
Exports, 2000 (% of GDP)	45.8	31.4	11.0	10.8	45.0	21.7	35.7	48.9	88.1	73.2	42.4
INDUSTRY 2											
Value added in industry (% of GDP)	33	28	26	36	45	26	26	33	27	43	26
Industrial production: % change (1990-2000)	29.1	48.4	49.0	2.2	131.8	27.5	30.8	45.6	16.6	-23.8	39.1
AGRICULTURE											
Value added in agriculture (% of GDP)	3	3	5	2	2	5	3	7	2	2	4
Agricultural production: % change (1990-1999)	26.6	25.5	19.7	-8.4	22.9	23.4	19.2	5.3	19.0	..	2.9
Livestock population, 2000 (million head of sheep eq.)	101	270	785	55	29	285	104	20	29	15	24
ENERGY											
Total supply, 1999 (Mtoe)	242	149	2270	515	181	108	18	28	59	39	20
% change (1990-1999)	15.6	20.0	17.9	17.5	97.5	23.3	30.0	12.7	21.1	-18.6	12.4
Energy intensity, 1999 (toe/1000 USD GDP)	0.31	0.20	0.26	0.17	0.25	0.24	0.27	0.15	0.24	0.30	0.15
% change (1990-1999)	-7.3	-9.1	-10.9	4.4	18.9	-10.4	3.8	-6.3	2.1	-9.3	-7.9
Structure of energy supply, 1999 (%)	4										
Solid fuels	15.8	9.8	27.4	18.0	21.6	48.8	12.4	22.0	14.1	49.5	30.8
Oil	35.4	62.6	38.9	51.7	55.0	33.0	35.5	41.7	41.3	21.3	46.1
Gas	28.8	20.8	23.0	12.0	8.4	16.9	26.5	23.9	22.8	19.9	21.8
Nuclear	7.8	1.8	8.9	16.0	14.8	-	-	-	21.8	9.0	-
Hydro, etc.	12.2	5.2	1.8	2.2	0.2	1.4	25.6	12.4	0.1	0.4	1.3
ROAD TRANSPORT 5											
Road traffic volumes per capita, 1999 (1000 veh.-km/cap.)	9.4	0.6	15.8	6.0	1.8	9.3	8.0	7.8	8.7	3.0	8.4
Road vehicle stock, 1999 (10 000 vehicles)	1876	1459	21533	7082	1116	1195	231	485	512	373	223
% change (1990-1999)	13.3	47.7	14.1	25.4	228.9	22.2	25.2	31.3	20.2	43.7	17.9
per capita (veh./100 inh.)	62	15	79	56	24	63	61	60	50	36	42

.. not available. - nil or negligible. x data included under Belgium.

1) Data may include provisional figures and Secretariat estimates. Partial totals are underlined.

2) Value added: includes mining and quarrying, manufacturing, gas, electricity and water and construction;
production: excludes construction.

Source: OECD Environmental Data Compendium.

OECD EPR / SECOND CYCLE

FIN	FRA	DEU	GRC	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	ESP	SLO	SWE	CHE	TUR	UKD	OECD
124	1362	1905	158	113	7	103	1266	19	395	117	348	161	717	56	203	198	421	1254	24860
24.0	19.2	20.5	25.0	8.3	27.3	98.2	17.0	76.2	33.3	38.9	43.2	29.0	29.6	11.4	18.7	9.3	41.9	24.3	29.8
23.9	22.9	23.2	14.9	11.3	26.3	27.2	22.0	42.7	24.8	26.1	9.0	16.1	18.2	10.4	22.9	27.6	6.3	21.0	22.2
42.5	28.9	33.3	22.1	61.6	34.3	95.2	28.4	119.7	67.1	46.3	26.8	31.3	29.9	73.5	47.4	45.1	23.8	27.2	21.7
34	25	31	24	34	29	36	30	20	27	36	36	31	30	35	29	30	30	30	30
64.9	17.7	13.9	12.5	48.2	..	223.5	15.7	26.6	21.7	41.4	63.6	21.8	23.5	-7.7	42.6	25.8	51.3	11.5	<u>27.9</u>
4	3	1	8	5	10	4	3	1	3	2	4	4	4	5	2	2	15	1	3
-16.0	7.5	-4.1	14.9	-21.3	1.5	12.4	10.6	x	-0.4	-7.6	-15.0	5.4	8.0	-19.8	-9.7	-5.8	7.7	-0.7	..
9	165	126	21	13	1	53	71	x	47	11	60	18	96	7	14	12	119	126	2687
33	255	337	27	25	3	14	169	3	74	27	93	24	118	18	51	27	70	230	5229
15.8	12.8	-5.2	23.5	-11.1	51.3	33.6	11.5	-2.2	11.4	23.9	-6.5	43.9	30.9	-17.0	9.5	6.5	33.6	8.1	15.9
0.29	0.19	0.18	0.18	0.23	0.44	0.15	0.14	0.20	0.19	0.23	0.28	0.15	0.17	0.33	0.26	0.14	0.18	0.19	0.22
-1.2	-2.3	-19.0	2.9	-13.7	23.1	-25.1	-1.9	-39.8	-13.2	-8.9	-32.0	15.1	5.1	-23.9	-4.5	0.8	0.9	-10.4	-7.0
35.7	10.2	24.8	36.4	18.3	1.8	19.0	8.3	4.9	12.0	9.5	69.1	21.1	19.8	29.1	21.7	5.8	38.3	16.3	23.7
32.1	34.6	40.1	57.1	27.8	26.5	58.9	54.1	73.0	38.8	33.8	21.1	67.6	54.0	17.5	27.8	48.0	41.9	36.2	41.3
10.3	13.2	21.4	4.5	39.3	-	21.5	33.6	21.8	47.7	17.8	9.5	8.2	11.3	32.2	1.4	8.9	15.1	36.3	21.1
18.5	39.4	13.1	-	14.6	-	-	-	-	1.4	-	-	-	13.0	19.0	37.1	24.5	-	11.0	11.0
3.4	2.5	0.7	2.0	0.1	71.7	0.6	4.1	0.3	0.1	38.9	0.2	3.1	1.9	2.2	12.1	12.9	4.7	0.2	2.8
8.9	8.3	7.4	7.3	3.5	6.5	8.3	9.0	8.9	7.0	7.2	4.5	5.7	4.3	2.2	8.4	7.2	0.8	7.8	8.0
239	3309	4503	389	274	17	148	3545	29	675	225	1104	461	2048	141	424	376	548	3055	57594
7.8	16.3	20.7	54.1	25.0	27.3	55.8	15.9	39.5	17.7	16.0	72.6	109.5	41.8	..	7.9	13.9	132.1	16.2	<u>22.2</u>
46	56	55	37	27	62	39	61	68	43	51	29	46	52	26	48	53	8	51	52

3) Agriculture, forestry, hunting, fishery, etc.

4) Breakdown excludes electricity trade.

5) Refers to motor vehicles with four or more wheels, except for Japan and Italy, which include three-wheeled goods vehicles.

ANNEX I.C: SELECTED SOCIAL DATA (1)

	CAN	MEX	USA	JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK
POPULATION											
Total population, 2000 (100 000 inh.)	308	991	2754	1268	472	192	38	81	102	103	53
% change (1990-2000)	11.0	22.0	10.2	2.6	10.1	12.3	13.9	4.8	2.8	-0.9	3.8
Population density, 2000 (inh./km ²)	3.1	50.6	29.4	335.7	475.2	2.5	14.2	96.4	335.5	130.3	123.8
Ageing index, 1999 (over 64/under 15)	64.1	15.5	59.2	113.0	31.4	59.2	51.0	90.4	93.5	79.3	81.1
HEALTH											
Women life expectancy at birth, 1998 (years)	81.5	77.6	79.5	84.0	78.1	81.8	80.4	80.9	81.1	78.1	78.8
Infant mortality, 1999 (deaths /1 000 live births)	5.3	14.5	7.2	3.4	7.7	5.7	6.8	4.4	5.3	4.1	4.2
Expenditure, 1999 (% of GDP)	9.2	5.3	12.9	7.5	5.4	8.6	8.1	8.2	8.8	7.4	8.4
INCOME AND POVERTY											
GDP per capita, 2000 (1000 USD/cap.)	26.6	8.2	33.2	24.7	16.4	24.5	18.4	24.2	24.8	12.9	25.6
Poverty (% pop. < 50% median income)	10.3	21.9	17.0	8.1	..	9.3	..	7.4	7.8	..	5.0
Inequality (Gini levels)	2	28.5	52.6	34.4	26.0	..	30.5	25.6	26.1	27.2	..
Minimum to median wages, 2000	3	42.5	21.1	36.4	32.9	23.8	57.9	46.3	x	49.2	30.4
EMPLOYMENT											
Unemployment rate, 2000 (% of total labour force)	6.8	2.3	4.0	4.7	4.1	6.6	6.0	4.6	7.0	8.8	4.8
Labour force participation rate, 2000 (% 15-64 year-olds)	77.4	56.3	67.2	78.1	65.2	75.3	65.4	77.5	63.7	79.7	80.5
Employment in agriculture, 1999 (%)	4	3.6	20.1	2.6	5.2	11.6	5.0	9.5	6.2	2.3	6.0
EDUCATION											
Education, 1999 (% 25-64 year-olds)	5	79.5	20.2	86.9	80.9	66.3	57.4	73.6	73.9	57.4	86.0
Expenditure, 1998 (% of GDP)	6	6.2	4.7	6.4	4.7	7.0	5.5	..	6.4	5.0	4.7
OFFICIAL DEVELOPMENT ASSISTANCE											
ODA, 2000 (% of GNP)	7	0.25	..	0.10	0.27	..	0.27	0.26	0.25	0.36	..
ODA, 2000 (USD/cap.)	56	..	35	103	..	52	30	57	79	..	312

.. not available. - nil or negligible. x not applicable.

1) Data may include provisional figures and Secretariat estimates. Partial totals are underlined.

2) Ranging from 0 (equal) to 100 (inequal) income distribution; figures relate to total disposable income (including all incomes, taxes and benefits) for the entire population.

3) Minimum wage as a percentage of median earnings including overtime pay and bonuses.

Source: OECD.

OECD EPR / SECOND CYCLE

FIN	FRA	DEU	GRC	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	ESP	SLO	SWE	CHE	TUR	UKD	OECD
52	594	821	106	100	3	38	576	4	159	45	386	100	394	54	89	72	668	596	11219
3.8	4.6	3.4	4.6	-3.4	10.2	8.1	1.6	14.1	6.2	5.9	1.3	1.3	1.5	2.5	3.7	6.9	18.9	3.6	7.7
15.3	108.1	229.9	80.0	107.7	2.7	53.9	191.3	169.6	382.4	13.9	123.5	108.8	77.9	110.0	19.7	173.8	85.7	243.5	32.3
81.3	83.7	107.1	95.2	84.8	49.0	50.9	119.6	75.6	73.0	77.1	59.9	90.3	108.9	57.5	98.7	87.2	17.6	81.6	63.2
81.0	82.2	80.5	79.4	75.2	81.5	79.1	81.6	80.5	80.7	81.1	77.5	78.8	82.4	77.0	81.9	82.5	71.3	79.7	..
3.6	4.4	4.5	5.9	8.5	2.4	5.5	5.1	4.7	5.2	3.9	8.9	5.5	4.9	8.3	3.4	4.6	36.6	5.8	..
6.8	9.3	10.3	8.4	6.8	8.7	6.8	7.9	6.1	8.7	8.5	6.2	7.7	7.0	..	7.9	10.4	4.8	6.9	..
23.9	22.9	23.2	14.9	11.3	26.3	27.2	22.0	42.7	24.8	26.1	9.0	16.1	18.2	10.4	22.9	27.6	6.3	21.0	22.2
4.9	7.5	9.4	13.8	7.3	..	11.0	14.2	..	6.3	10.0	..	..	..	..	6.4	6.2	16.2	10.9	..
22.8	27.8	28.2	33.6	28.3	..	32.4	34.5	..	25.5	25.6	..	..	..	..	23.0	26.9	49.1	32.4	..
x	60.8	x	51.3	35.6	x	x	x	48.9	46.7	x	35.5	38.2	31.8	..	x	x	..	x	..
9.8	9.7	7.8	11.3	6.5	1.3	4.3	10.7	2.6	2.4	3.4	16.1	4.0	14.1	18.8	4.7	2.0	6.4	5.5	<u>6.2</u>
74.5	68.6	74.7	61.8	58.8	77.6	69.6	60.0	64.3	66.4	80.9	65.3	75.0	65.6	69.3	76.2	81.2	51.7	76.1	<u>68.4</u>
6.3	4.2	2.8	17.7	7.3	8.6	8.6	6.4	2.0	3.0	4.6	17.9	13.6	7.4	7.4	2.6	4.7	45.1	1.6	<u>7.8</u>
71.5	61.9	81.2	49.9	67.4	56.0	51.3	42.2	55.9	..	84.6	54.0	21.2	35.1	..	76.6	81.7	22.2	61.7	<u>62.0</u>
5.7	6.2	5.5	4.8	5.0	6.9	4.7	5.0	..	4.6	6.9	..	5.7	5.3	..	6.8	5.9	3.5	4.9	<u>5.6</u>
0.31	0.33	0.27	0.19	..	..	0.30	0.13	0.70	0.82	0.80	..	0.26	0.24	..	0.81	0.34	..	0.31	0.22
72	71	61	20	..	..	63	24	265	194	281	..	26	34	..	204	124	..	75	63

4) Civil employment in agriculture, forestry and fishing.

5) Upper secondary or higher education; OECD: average of rates.

6) Public and private expenditure on educational institutions; OECD: average of rates.

7) Official Development Assistance by Member countries of the OECD Development Assistance Committee.

ANNEX II.A: SELECTED MULTILATERAL AGREEMENTS (WORLDWIDE)

Y = in force S = signed R = ratified D = denounced

		CAN	MEX	USA	JPN
1946	Washington	Conv. - Regulation of whaling	Y	D	R R R R
1956	Washington	Protocol	Y	R	R R R R
1949	Geneva	Conv. - Road traffic	Y	R	R R
1954	London	Conv. - Prevention of pollution of the sea by oil	Y	R	R R R R
1971	London	Amendments to convention (protection of the Great Barrier Reef)		R	
1957	Brussels	Conv. - Limitation of the liability of owners of sea-going ships	Y	S	
1979	Brussels	Protocol	Y		D
1958	Geneva	Conv. - Fishing and conservation of the living resources of the high seas	Y	S	R R
1960	Geneva	Conv. - Protection of workers against ionising radiations (ILO 115)	Y	R	R
1962	Brussels	Conv. - Liability of operators of nuclear ships			
1963	Vienna	Conv. - Civil liability for nuclear damage	Y	R	
1988	Vienna	Joint protocol relating to the application of the Vienna Convention and the Paris Convention	Y		
1997	Vienna	Protocol to amend the Vienna convention			
1963	Moscow	Treaty - Banning nuclear weapon tests in the atmosphere, in outer space and under water	Y	R	R R R R
1964	Copenhagen	Conv. - International council for the exploration of the sea	Y	R	R
1970	Copenhagen	Protocol	Y	R	R
1969	Brussels	Conv. - Intervention on the high seas in cases of oil pollution casualties (INTERVENTION)	Y	R	R R R
1973	London	Protocol (pollution by substances other than oil)	Y	R	R
1969	Brussels	Conv. - Civil liability for oil pollution damage (CLC)	Y	R	D S D
1976	London	Protocol	Y	R	R R
1992	London	Protocol	Y	R	R R
1970	Bern	Conv. - Transport of goods by rail (CIM)	Y		
1971	Brussels	Conv. - International fund for compensation for oil pollution damage (FUND)	Y	D	D S D
1976	London	Protocol	Y	R	R R
1992	London	Protocol	Y	R	R R
1971	Brussels	Conv. - Civil liability in maritime carriage of nuclear material	Y		
1971	London, Moscow, Washington	Conv. - Prohib. emplacement of nuclear and mass destruct. weapons on sea-bed, ocean floor and subsoil	Y	R	R R R R
1971	Ramsar	Conv. - Wetlands of international importance especially as waterfowl habitat	Y	R	R R R R
1982	Paris	Protocol	Y	R	R R R R
1987	Regina	Regina amendment	Y	R	R R
1971	Geneva	Conv. - Protection against hazards of poisoning arising from benzene (ILO 136)	Y		
1972	London, Mexico, Moscow, Washington	Conv. - Prevention of marine pollution by dumping of wastes and other matter (LC)	Y	R	R R R R
1996	London	Protocol to the Conv. - Prevention of marine poll. by dumping of wastes and other matter	R	S	
1972	Geneva	Conv. - Protection of new varieties of plants (revised)	Y	R	R R R R
1978	Geneva	Amendments	Y	R	R R R R
1991	Geneva	Amendments	Y		R R
1972	Geneva	Conv. - Safe container (CSC)	Y	R	R R R R
1972	London, Moscow, Washington	Conv. - International liability for damage caused by space objects	Y	R	R R R R
1972	Paris	Conv. - Protection of the world cultural and natural heritage	Y	R	R R R R
1973	Washington	Conv. - International trade in endangered species of wild fauna and flora (CITES)	Y	R	R R R R
1974	Geneva	Conv. - Prev. and control of occup. hazards caused by carcinog. subst. and agents (ILO 139)	Y		R
1976	London	Conv. - Limitation of liability for maritime claims (LLMC)	Y	R	R
1996	London	Amendment to convention		S	
1977	Geneva	Conv. - Protection of workers against occupational hazards in the working environment due to air pollution, noise and vibration (ILO 148)	Y		
1978	London	Protocol - Prevention of pollution from ships (MARPOL PROT)	Y	R	R R R R
1978	London	Annex III	Y		R R
1978	London	Annex IV			R

ANNEX II.A: SELECTED MULTILATERAL AGREEMENTS (WORLDWIDE) (cont.)

Y = in force S = signed R = ratified D = denounced

		CAN	MEX	USA	JPN
1978	London	Annex V	Y	R	R R
1997	London	Annex VI			
1979	Bonn	Conv. - Conservation of migratory species of wild animals	Y		
1991	London	Agreem. - Conservation of bats in Europe	Y		
1992	New York	Agreem. - Conservation of small cetaceans of the Baltic and the North Seas (ASCOBANS)	Y		
1996	Monaco	Agreem. - Conservation of cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area	Y		
1996	The Hague	Agreem. - Conservation of African-Eurasian migratory waterbirds	Y		
1982	Montego Bay	Conv. - Law of the sea	Y S	R	R
1994	New York	Agreem. - relating to the implementation of part XI of the convention	Y S	R	S R
1995	New York	Agreem. - Implementation of the provisions of the convention relating to the conservation and management of straddling fish stocks and highly migratory fish stocks	R	R	S S
1983	Geneva	Agreem. - Tropical timber	Y R	R	R R
1994	New York	Revised agreem. - Tropical timber	Y R	R	R R
1985	Vienna	Conv. - Protection of the ozone layer	Y R	R R	R R
1987	Montreal	Protocol (substances that deplete the ozone layer)	Y R	R R	R R
1990	London	Amendment to protocol	Y R	R R	R R
1992	Copenhagen	Amendment to protocol	Y R	R R	R R
1997	Montreal	Amendment to protocol	Y R		
1999	Beijing	Amendment to protocol	R		
1986	Vienna	Conv. - Early notification of a nuclear accident	Y R	R R	R R
1986	Vienna	Conv. - Assistance in the case of a nuclear accident or radiological emergency	Y S	R R	R R
1989	Basel	Conv. - Control of transboundary movements of hazardous wastes and their disposal	Y R	R S	R R
1995	Geneva	Amendment			
1999	Basel	Prot. - Liability and compensation for damage			
1989	London	Conv. - Salvage	Y R	R R	R R
1990	Geneva	Conv. - Safety in the use of chemicals at work (ILO 170)	Y	R	
1990	London	Conv. - Oil pollution preparedness, response and co-operation (OPRC)	Y R	R R	R R
1992	Rio de Janeiro	Conv. - Biological diversity	Y R	R S	R R
2000	Montreal	Prot. - Biosafety	S	S	
1992	New York	Conv. - Framework convention on climate change	Y R	R R	R R
1997	Kyoto	Protocol	S	R S	R R
1993	Paris	Conv. - Prohibition of the development, production, stockpiling and use of chemical weapons and their destruction	Y R	R S	R R
1993	Geneva	Conv. - Prevention of major industrial accidents (ILO 174)	Y		
1993		Agreem. - Promote compliance with international conservation and management measures by fishing vessels on the high seas	R	R R	R R
1994	Vienna	Conv. - Nuclear safety	Y R	R R	R R
1994	Paris	Conv. - Combat desertification in those countries experiencing serious drought and/or desertification, particularly in Africa	Y R	R R	R R
1995	Rome	Code of conduct on responsible fishing			
1996	London	Conv. - Liability and compensation for damage in connection with the carriage of hazardous and noxious substances by sea	S		
1997	Vienna	Conv. - Supplementary compensation for nuclear damage			S
1997	Vienna	Conv. - Joint convention on the safety of spent fuel management and on the safety of radioactive waste management	Y R		S
1997	New York	Conv. - Law of the non-navigational uses of international watercourses			
1998	Rotterdam	Conv. - Prior informed consent procedure for hazardous chemicals and pesticides (PIC)			S S
2001	London	Conv. - Civil liability for bunker oil pollution damage			
2001	Stockholm	Conv. - Persistent organic pollutants	R	S S	S

Source: IUCN; OECD.

OECD EPR / SECOND CYCLE

Y = in force S = signed R = ratified D = denounced

KOR	AUS	NZL	AUT	BEL	CZE	DNK	FIN	FRA	DEU	GRC	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	ESP	SLO	SWE	CHE	TUR	UKD	EU
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
												S														
R				R	R	R	R	R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R
				S				R				R				R										
				R				R				R				R										
								S		S		S				S		R		S		S				
				S				R				R				R										
R	R	R	R	R	R	R	S	R	R	R	R	S	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	S	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
S	R	R	S	S		S	S	S	S	S		R	S	S	S	S	R		S	S		S		S	S	
R	R	R	R	R		R	R	R	R	R			R	R	R	R	R		R	R		R	R	R	R	R
R	R	R	R	R		R	R	R	R	R			R	R	R	R	R		R	R		R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	S	R	R	R		R		R	R		R	R	R	R		R	R		R	R	R	R	R
				R				R				R				R										
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	S	R	R	R	R	R	S	R	R	R	S	R	S	S	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
				R				R				R				R										
								S		S		S				S		S								
R				R	R	R	R	R	R	R	R		R	R	R	R	R		R	R		R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
												S														
				S				S				S				S										
S	S		R	S	R	R	R	R	R	R	R		R	S	R	R	R	R		R	R	R	R	R	R	R
								R		S		R				S		R								
S	S	S	S	S	R	S	S	S	R	S	R		S	S	R	R	S	S	S		S	R	S	S	S	
S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	R	S	S	S	S	S	S	S	S	S	S

ANNEX II.B: SELECTED MULTILATERAL AGREEMENTS (REGIONAL)

Y = in force S = signed R = ratified D = denounced

		CAN	MEX	USA	JPN
1933	London	Conv. - Preservation of fauna and flora in their natural state		Y	
1946	London	Conv. - Regulation of the meshes of fishing nets and the size limits of fish		Y	
1958	Dublin	Amendments		Y	
1960	London	Amendments		Y	
1961	Copenhagen	Amendments		Y	
1962	Hamburg	Amendments		Y	
1963	London	Amendments		Y	
1950	Paris	Conv. - Protection of birds		Y	
1957	Geneva	Agreem. - International carriage of dangerous goods by road (ADR)		Y	
1975	New York	Protocol		Y	
1958	Geneva	Agreem. - Adoption of uniform conditions of approval and reciprocal recognition of approval for motor vehicle equipments and parts		Y	
1959	Washington	Treaty - Antarctic	Y	R	R R
1991	Madrid	Protocol to the Antarctic treaty (environmental protection)	Y	S	R R
1960	Paris	Conv. - Third party liability in the field of nuclear energy		Y	
1963	Brussels	Supplementary convention		Y	
1964	Paris	Additional protocol to the convention		Y	
1964	Paris	Additional protocol to the supplementary convention		Y	
1982	Brussels	Protocol amending the convention		Y	
1982	Brussels	Protocol amending the supplementary convention		Y	
1988	Vienna	Joint protocol relating to the application of the Vienna Convention and the Paris Convention	Y		
1964	Brussels	Agreem. - Measures for the conservation of Antarctic Fauna and Flora	Y		R R
1964	London	Conv. - Fisheries		Y	
1966	Rio de Janeiro	Conv. - International convention for the conservation of Atlantic tunas (ICCAT)	Y	R	R R
1968	Strasbourg	Agreem. - Restriction of the use of certain detergents in washing and cleaning products		Y	
1983	Strasbourg	Protocol		Y	
1968	Paris	Conv. - Protection of animals during international transport		Y	
1979	Strasbourg	Protocol		Y	
1969	London	Conv. - Protection of the archaeological heritage		Y	
1969	Rome	Conv. - Conservation of the living resources of the Southeast Atlantic		Y	D
1972	London	Conv. - Conservation of Antarctic seals	Y	R	R R
1974	Paris	Conv. - Prevention of marine pollution from land-based sources		Y	
1986	Paris	Protocol		Y	
1992	Paris	Conv. - Protection of North-East Atlantic marine env. (replace Oslo-1972 and Paris-1974)		Y	
1976	Barcelona	Conv. - Protection of the Mediterranean Sea against pollution		Y	
1976	Barcelona	Protocol (dumping from ships and aircraft)		Y	
1995	Barcelona	Protocol (dumping from ships and aircraft or incineration at sea)		Y	
1976	Barcelona	Protocol (pollution by oil and other harmful substances in cases of emergency)		Y	
1980	Athens	Protocol (pollution from land-based sources)		Y	
1996	Syracuse	Protocol (pollution from land-based sources and activities)		Y	
1982	Geneva	Protocol (specially protected areas)		Y	
1996	Monaco	Protocol (specially protected areas and biological diversity)		Y	
1994	Madrid	Protocol (pollution from exploitation of continental shelf, seabed and subsoil)		Y	
1996	Izmir	Protocol (pollution by transboundary movements of hazardous wastes and their disposal)		Y	
1995	Barcelona	Amendment to convention		Y	

ANNEX II.B: SELECTED MULTILATERAL AGREEMENTS (REGIONAL) (cont.)

Y = in force S = signed R = ratified D = denounced

		CAN	MEX	USA	JPN
1976 Monaco	Agreem. - Protection of the waters of the mediterranean coastline (RAMOGE)	Y			
1979 Bern	Conv. - Conservation of European wildlife and natural habitats	Y			
1979 Geneva	Conv. - Long-range transboundary air pollution	Y	R		R
1984 Geneva	Protocol (financing of EMEP)	Y	R		R
1985 Helsinki	Protocol (reduction of sulphur emissions or their transboundary fluxes by at least 30%)	Y	R		
1988 Sofia	Protocol (control of emissions of nitrogen oxides or their transboundary fluxes)	Y	R		R
1991 Geneva	Protocol (control of emissions of volatile organic compounds or their transboundary fluxes)	Y	S		S
1994 Oslo	Protocol (further reduction of sulphur emissions)	Y	R		
1998 Aarhus	Protocol (heavy metals)			R	R
1998 Aarhus	Protocol (persistent organic pollutants)			R	S
1999 Gothenburg	Protocol (abate acidification, eutrophication and ground-level ozone)			S	S
1980 Madrid	Conv. - Transfrontier co-operation between territorial communities or authorities	Y			
1995 Strasbourg	Additional protocol	Y			
1998 Strasbourg	Second protocol	Y			
1980 Canberra	Conv. - Conservation of Antarctic marine living resources	Y	R		R R
1980 Bern	Conv. - International carriage of dangerous goods by train (COTIF)				
1980 London	Conv. - Multilateral co-operation in North-East Atlantic fisheries	Y			
1982 Paris	Memorandum of understanding on port state control	Y	R		
1991 Espoo	Conv. - Environmental impact assessment in a transboundary context	Y	R		S
1991 Salzburg	Conv. - Protection of Alps	Y			
1994 Chambéry	Prot. - Nature protection and landscape conservation				
1994 Chambéry	Prot. - Town and Country Planning and Sustainable Development				
1994 Chambéry	Prot. - Mountain agriculture				
1996 Brdo	Prot. - Mountain forests				
1996 Brdo	Prot. - Tourism				
1998 Bled	Prot. - Energy				
1998 Bled	Prot. - Land conservation				
2000 Lucerne	Prot. - Transport				
1992 Helsinki	Conv. - Transboundary effects of industrial accidents			S	S
1992 Helsinki	Conv. - Protection and use of transboundary water courses and international lakes	Y			
1999 London	Prot. - Water and health				
1992 La Valette	European Conv. - Protection of the archaeological heritage (revised)	Y			
1992 Vienna	Agreem. - Forecast, prevention and mitigation of natural and technological disasters				
1993 Lugano	Conv. - Civil liability for damage resulting from activities dangerous to the environment				
1994 Lisbon	Treaty - Energy Charter	Y			S
1994 Lisbon	Protocol (energy efficiency and related environmental aspects)	Y			S
1998 Aarhus	Conv. - Access to envtal information and public participation in envtal decision-making	Y			
1998 Strasbourg	Conv. - Protection of the environment through criminal law				
2000 Florence	Conv. - European lanscape convention				
2000 Geneva	Agreem. - International carriage of dangerous goods by inland waterways (AND)				

Source: IUCN; OECD.

Annex III

SELECTED ENVIRONMENTAL EVENTS (1994-2001)

1994

- Galli Act on water resources (Act 36/1994).
- National Environmental Protection Agency (ANPA) established (Act 61/1994).
- Environmental declaration on waste generation and management (Act 70/1994).

1995

- Regulatory authority for electricity and gas pricing established.
- Penal sanctions for water pollution introduced.
- Noise pollution regulated (Act 447/1995).
- Approval of second three-year programme for protected areas (1997-99).
- National Eco-audit and Eco-label Committee established.

1996

- Italy assumes EU presidency during first half of year.
- Specification of regions' competencies for environmental damage and illegal construction.
- Measures taken to bring gas to southern Italy.
- Gas tanker explosion 22 km from Genoa (2 October).

1997

- Guidelines issued for the second National Communication to UN Framework Convention on Climate Change.
- Transposition of EU directive on freedom of access to environmental information (90/313).

- Transposition of EU directive on classification, packaging and labelling of hazardous substances (93/32).
- Transposition of EU Habitat Directive (92/43).
- Ronchi Decree transposes EU directives on municipal (91/156), hazardous (91/689) and packaging waste (94/62).
- Bassanini Act (59/1997) reforms public administration, devolving powers to regions.
- 1997 State of the Environment report.
- Entry into force of EU Council Regulation on Eco-Management and Audit Scheme (1836/93).
- Competencies for agriculture and fisheries granted to regions.
- Introduction of incentives for scrapping old vehicles.
- Measures taken to restructure road freight transport and develop intermodal transport.
- National Committee to Combat Desertification established.
- Landslide in Castellammare (Campania) cuts this region off from rest of Italy (10 January).
- Archaeological heritage damaged by earthquake in Marche and Umbria (26 September).

1998

- New environmental impact assessment procedures for main airports.
- Measures taken to encourage use of bicycles.
- Construction of mobile flood protection dams in Venice stopped.
- Landslide in Sarno (Campania) causes 174 deaths (30 April).
- Reform of national and regional waste inventory (Ministerial Decree 372/98).

1999

- Decree 152/1999 transposes EU directives on urban sewage treatment (91/271) and nitrates (91/676).
- Transposition of EU directive on disposal of polychlorinated biphenyls (PCBs)/ polychlorinated terphenyls (PCTs) (96/59).
- Transposition of EU directive on integrated pollution prevention and control (96/61).

- Transposition of EU directive on ambient air quality assessment and management (96/62).
- Transposition of EU directive on control of major accident hazards (Seveso II, 96/82).
- Transposition of EU directives on transport of dangerous goods by rail (96/49, 96/87).
- Alpine Convention ratified (Act 403/1999).
- Inter-ministerial Committee for Economic Planning (CIPE) approves National Action Programme to Combat Desertification.
- Imprisonment for setting forest fires introduced.
- “White Book” for valorisation of renewable sources adopted.
- Support granted for production and use of renewable energy in agriculture.
- Approval of criteria for reclamation of contaminated sites.
- First car-free Wednesday.
- Mont Blanc tunnel fire leaves 39 dead (24 March).

2000

- Framework Act on Forest Fires (353/2000).
- Transposition of EU directive on contained use of genetically modified organisms (98/81).
- White paper on monitoring the state of the environment in Italy (ANPA).
- Measures taken to restructure road freight transport and develop intermodal transport.
- Urgent measures taken to develop wastewater treatment in Milan.
- First ecological Sunday in 150 cities (cars and two-wheeled vehicles banned between 10 am to 6 pm).
- Flood in Soverato (Calabria) destroys camping site, causing 10 deaths (10 September).

2001

- Transposition of EU directive on drinking water quality (98/83).
- Amendment to Montreal Protocol on protection of the ozone layer ratified.
- Aarhus Convention on access to environmental information ratified.

- Measures to prevent pollution from maritime oil transport and control maritime traffic.
- Launch of “photo-voltaic roofs” programme.
- Electromagnetic Radiation Protection Act (36/2001).
- Ministry of the Environment takes over responsibility for soil conservation from Ministry of Public Works and is renamed Ministry of the Environment and Land Protection (MATT).
- 2001 State of the Environment report.
- Italy’s first comprehensive environmental data compendium published by SINANet (ANPA).
- G8 Environment Ministers meet in Trieste (2-4 March).
- Voluntary agreement between MATT, Ministry of Infrastructure and Transport (MIT) and manufacturers’ associations to ban single-hull oil tankers by 2003 (compared with IMO’s 2015 deadline).

Annex IV

PHYSICAL CONTEXT

Italy shares *borders* with France, Switzerland, Austria and Slovenia. It has shores along four Mediterranean seas (Ligurian, Tyrrhenian, Ionian and Adriatic). Extending more than 1 200 km from north to south, Italy has an exceptionally long coastline (almost 7 500 km). Over 30% of the population lives in coastal areas.

Most of the country is *mountainous*. Plains occupy less than one-quarter of the territory. The Alps reach 4 700 metres and the Apennines 2 900 metres. The area between Campania and Sicily is particularly liable to volcanic eruptions (Vesuvius, Etna), earthquakes and other geothermal activity. Nearly 3 000 Italian municipalities (out of 8 100) are subject to seismic events, 368 with high risk. In 1997 Italy experienced an earthquake registering 5.8 on the Richter scale (98 earthquakes between 6 and 7.5 have occurred over the last 1 000 years). Severe flooding and landslides have taken place in recent years. Emergency measures to cope with hydro-geological risks have entailed massive transfers from the central budget.

Italy has a wide variety of *ecosystems and landscapes*, reflecting variations in climate (from Mediterranean to Alpine and continental) as well as its very rich cultural heritage. Average rainfall (1 000 mm/year) is not evenly distributed over seasons and regions; high evaporation rates are responsible for significant losses, especially in the South and on the islands. The Po river basin is the country's largest. All other major rivers are comparatively short and steep. The main lakes are located in Alpine valleys. The Adriatic, enclosed and relatively shallow, receives the waters of the Po and several other major rivers.

Approximately 31% of *land* is cropland and 16% is permanent grassland; 23% is forested. There are few mineral resources. Some oil, gas and coal are exploited, but this represents a very small part of national consumption.



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