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FOREWORD

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

– 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 present report reviews France's environmental performance. 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 (Belgium, Canada and Italy) and their experts. The OECD is particularly indebted to the Government of France for its co-operation in expediting the provision of information and the organisation of the experts' mission to France, and in facilitating contacts with many individuals both inside and outside administrative and governmental structures. The present review benefited from grant support from Japan and Switzerland.

The OECD Working Party on Environmental Performance conducted the review of France at its meeting on 24-26 January 2005 and approved its conclusions and recommendations.

Lorents G. Lorentsen
Director, Environment Directorate

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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 (Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey and United Kingdom).

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 2003, EUR 0.885 = USD 1.

Cut-off Date

This report is based on information and data available up to January 2005.

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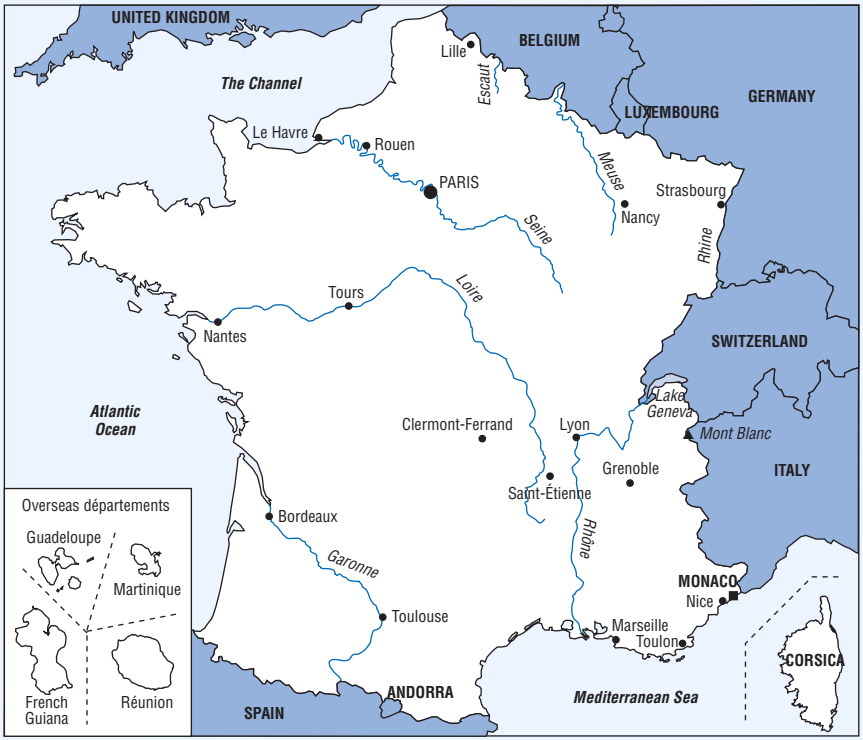
Map of France



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CONCLUSIONS AND RECOMMENDATIONS*

In France, environmental and natural resource issues arise not only in the national framework, but also in the context of *European and global interdependencies*. The country's environmental policy has influenced, and been influenced by, EU environmental policy making. Beyond Metropolitan France, its overseas départements give the country a wider environmental responsibility. Moreover, these European and global interdependencies have aspects that are *physical* (e.g. transboundary pollution and joint stewardship of common resources) as well as *economic* (e.g. EU market integration and world trade). France is thus engaged in bilateral, regional and global environmental co-operation.

Over the review period (1996-2004), environmental management in France benefited from *institutional* strengthening, increased public and private *expenditure* and consideration of *sustainable development* in policy choices. Attention to environmental issues has reinforced economic development through the conservation of resources such as water and energy, the creation of environmental jobs, lower spending on public health and protection of the urban and natural heritage and landscape. *Major concerns* remain as regards pollution from agriculture and transport, the development of energy policy, improvement of environmental health and management of natural and technological risk. Other key concerns include pressures from urbanisation and the need to protect natural spaces, coastal areas and mountains, which are assets for tourism. International environmental issues, such as implementation of multilateral environmental agreements, marine conservation and the environment-development interface, are also at the top of the environmental agenda.

* Conclusions and Recommendations reviewed and approved by the Working Party on Environmental Performance at its meeting on 25 January 2005. This OECD report covers Metropolitan France and the overseas départements.

To meet these challenges, France will have to: i) strengthen environmental policy implementation; ii) integrate environmental concerns into sectoral and fiscal policies; and iii) pursue international co-operation. This review examines progress made by France *since the previous OECD Environmental Performance Review*, and the extent to which the country's *national objectives* and *international commitments* are being met. It also reviews progress in the context of the *OECD Environmental Strategy*.* Forty-nine recommendations are put forward that could help strengthen France's environmental performance in a context of sustainable development.

1. Environmental Management

Implementing more efficient environmental policies

France has a vast, coherent body of environmental legislation that is consistent with the principle of subsidiarity. The *Environmental Charter* approved in 2004, was incorporated into the Constitution in February 2005. The 2000 *Environment Code* provided an opportunity to clarify France's environmental legislation, which has both influenced and been influenced by EU environment law (e.g. as concerns integrated pollution prevention and control for France's 68 000 classified installations). The *new law on risk* permits better economic assessment of natural and technological risk in spatial planning. Environmental policy implementation is carried out through a *balanced package of instruments* including regulation, economic instruments, planning and voluntary approaches. Enforcement of environmental regulations has benefited from a strengthened inspection system. A wide range of *economic instruments* is used. Charges for water services and waste management, and some other economic instruments, are used effectively. Several environmental taxes (as part of the general tax on polluting activities) were created. New instruments, such as trading in greenhouse gas emission permits, are being developed. Planning tools (e.g. state-regional contractual plans, climate plan, health and environment plan) and the system of land use planning play their part. Better institutional integration of economic concerns within environmental policies has been made possible by remarkable progress on *economic studies* and environmental assessments within the *Ministry of Ecology and Sustainable Development*.

* Objectives of the 2001 OECD Environmental Strategy covered in these Conclusions and Recommendations are maintaining integrity of ecosystems (Section 1), decoupling environmental pressures from economic growth (Sections 2.1 and 2.3), the social and environmental interface (Section 2.2) and global environmental interdependence (Section 3).

Environmental protection expenditure has risen to 1.9% of GDP and total environment-related expenditure (including water services and material recycling and recovery) to 2.8% of GDP. There is no indication that environmental action has affected the competitiveness of the French economy as a whole.

Nevertheless, local implementation of *laws and regulations* relating to the environment and land use should be improved, including the laws concerning risk, coastal areas and mountains. Some EU directives, such as those on nitrates, urban waste water, birds and habitats, pose problems. Much work is still needed to address water pollution from urban and agricultural run-off. Possibilities for co-operative efforts on nature and biodiversity protection could be further explored. For some *economic instruments*, rates need to be adjusted so as to better internalise positive and negative externalities. The major drive for *environmental tax reform* begun in 1999 did not come to fruition. An in-depth examination of the environmental effects of taxes and subsidies should be done, and requires the establishment of a green tax commission.

Recommendations:

- establish a *green tax commission*, attached to the Prime Minister;
- increase *rates of environmental taxes and charges*, thereby increasing their incentive effect and reducing the budgetary cost of government environmental policies;
- ensure that economic instruments are introduced to address *externalities associated with agriculture*;
- in water management, maintain the *basin-wide approach* and setting of charges by the river basin authorities in a context of overall control by the Parliament;
- continue to strengthen *enforcement of environmental regulations*; improve their integration in land use planning documents, including at local level; strictly apply the laws on risk, mountains and coastal areas, including at local level;
- continue to carry out *economic studies* necessary for efficient action on the environment.

Air

Since 1990, France has made progress in *reducing emissions* of most conventional pollutants, heavy metals and organic compounds and in decoupling them from economic growth. Emissions per unit of GDP are generally significantly lower than OECD averages, and in some cases (e.g. CO_2) among the lowest. This performance reflects not only the structure of the country's economy and energy resources but also environmental action through legislation (e.g. the 1996 Law on Air and Energy Efficiency), regulation (e.g. of classified installations) and economic instruments (e.g. taxes on polluting activities). France is a *determined player* on the international stage, complying with and sometimes exceeding its many commitments. For *vehicle emissions*, EU standards enable fleet improvement. Measures have been taken to promote use of cleaner fuels, for example by reducing the tax on *liquefied natural gas*. New transport and planning policies at municipal and regional levels (e.g. *urban development plans*) involve measures such as widespread imposition of parking fees, more efficient public transport and increased use of natural gas. In *structural terms*, the transport sector includes a high-speed train network for passenger transport, a toll trunk motorway network and urban public transport largely financed by companies.

Recommendations:

- step up measures to reduce *NO_x emissions* from transport (e.g. diesel vehicles), agriculture (diesel fuel and waste combustion), industry (chemicals, ferrous metals and food processing) and energy (thermal power generation);
- strengthen measures to limit *particulate* emissions (e.g. from wood, biomass and diesel combustion) and consider introducing ambient quality standards for *fine and ultrafine particulates* ($PM_{2.5}$ and $PM_{1.0}$);
- increase the *use of rail* for passenger and goods transport and the use of combined goods transport, in the context of a modal shift framework policy based on improved internalisation of road transport externalities;
- implement *urban mobility plans*, increase the use of *economic instruments* in urban transport (notably as regards private vehicle parking and use) and introduce measures to improve emissions from heavy vehicles (e.g. bus traffic, transport of goods and waste);
- examine the impacts of *maritime, inland waterway and air transport* (including emissions from international journeys) on regional air quality and consider national or international measures to reduce them.

This progress notwithstanding, several challenges remain, mainly concerning ozone, NO_x and fine particulates, which adversely affect health. A great deal remains to be done to reduce particulate emissions from diesel vehicles and wood heating, and *NO_x* emissions from transport, to solve urban air quality problems and meet emission reduction targets for 2010. In addition, dioxin emission levels must be further decreased, and steps must be taken to prevent any increase in emissions of *ammonia* from farming and to control emissions of *hexachlorobenzene*. Integration of environmental and air quality concerns in the transport sector remains a major challenge. Improvements to the *road vehicle fleet* must continue and accelerate, for instance through technological improvements to diesel vehicles, two-wheeled motor vehicles and goods vehicles. Local and regional *urban and transport management plans* must be put into effect. Greater use could be made of *economic instruments* (e.g. parking fees, congestion charges, taxation of vehicles and vehicle use, fuel taxes), in an EU framework where appropriate. In *structural terms*, the externalities associated with road transport need to be internalised, especially as regards transport of goods and of waste. Higher priority should be given to rail and combined goods transport. Greater attention should be paid to emissions from maritime, inland waterway and air transport. More generally, air quality concerns need to be better integrated into energy, agriculture and tourism policies.

Water

The role of the river basin authorities, which were established in 1964 and buttressed by the 1992 Water Law, has expanded from purely financial tasks (collecting abstraction and pollution charges and distributing the revenue for investment) to assessment of the state of aquatic environments and to planning. The integrated management at major basin level, which is partnership-based and multi-annual, has proved highly effective, especially in dealing with industrial and municipal pollution problems by applying the polluter pays and user pays principles. *Industrial pollution* of watercourses has continued to decrease. Meters have been installed to improve *management of water resources*, especially for irrigation. A drought plan was introduced following the 2003 heatwave. Flood prevention plans were introduced in 2003 and are binding on third parties. Operating and investment costs are *financed* by cost-recovery charges and Water Agency charges, respectively. This approach should give France favourable conditions for meeting its forthcoming obligations under the EU Water Framework Directive. *Taxes* have been introduced on pesticides, on phosphate detergents and on aggregates extraction; the scope of a more recent

levy on nitrates should be extended. With floods and flood damage becoming more frequent, much has been done in terms of legislation, regulation and planning to prevent floods and their consequences.

Over the last ten years or so, however, weaknesses in water policy have become apparent, relating to such *emerging issues* as chronic pollution by newer products such as endocrine disrupters and antibiotics, whose effects are still poorly understood. *Agricultural pollution* of watercourses with nitrates and pesticides continues despite the measures taken. Insufficient attention is paid to ecosystems such as riverbanks. *Drinking water quality* continues to be a concern in places, notably where supply sources are insufficiently protected. *Enforcement efforts*, despite progress, are dispersed among various services, reducing effectiveness. The Water Agencies do not base their *financing decisions* on economic analysis of proposed projects, and cross-subsidisation from households to farmers often occurs. The level of *waste water treatment* has not improved sufficiently, and France is under threat by the European Commission of having to pay a penalty for its shortcomings on this point.

Recommendations:

- reduce *pollution of agricultural origin* (from both crop and livestock farming) by continuing to reform farm subsidies (to decrease incentives for pollution-prone intensive farming), by implementing cross-compliance in agricultural support and by introducing efficient, targeted measures to reduce excessive nitrogen use at individual farm level;
- improve the balance between Water Agencies' outlays on and income from *agriculture*;
- continue to develop *flood risk prevention plans* and establish a monitoring mechanism to ensure that they are effectively put into practice;
- consolidate *water policing* powers in each département and assure stricter control of compliance with water-related provisions of the Environment Code;
- take a more holistic approach to *basin-based management* by extending the Water Agencies' role, in particular as regards wetland protection;
- review the *Water Agencies' procedures for financial allocations* so as to make them more economically and environmentally effective; make economic analysis of projects systematic.

Nature and biodiversity

France has exceptionally rich biological resources and therefore great *responsibility* both within Europe and, through its presence in three oceans, worldwide. It has *recognised knowledge* in most aspects of biodiversity, from microbiology to ecosystem processes, through institutions (e.g. Natural History Museum, French Research Institute for Exploitation of the Sea) that lead their fields in the development and dissemination of scientific knowledge. During the review period, France carried out an inventory of nearly 15 000 natural areas of interest for their ecology, fauna and flora in Metropolitan France and one of landscapes in 52 départements. The country has a comprehensive *body of laws* relating to the protection of nature, biodiversity and landscapes. During the review period, laws on fishing, hunting and forests were added to the principal laws on nature, mountains, coastal areas and landscapes. Today *13.3% of Metropolitan France* is under protection, compared with 9.5% in 1996. Excellent progress is being made on regional nature parks and projects to enhance major sites. The joint involvement of public institutions, technical and financial partners, local authorities and volunteers in implementing natural heritage conservation projects should be noted. *Forest management* is developing more of an ecosystem approach, and eco-certification of woodland is accelerating. A more environment-friendly approach is also being taken in agriculture, for example with the conclusion of 40 000 sustainable farming contracts covering 3 million hectares. France is fulfilling its *international global nature conservation commitments* (e.g. Convention on Biological Diversity, CITES, Ramsar Convention) and contributes to progress in this area with initiatives such as IFRECOR on coral reefs. Following the French President's declaration at the Johannesburg Summit, a national sustainable development strategy was adopted in 2003 and a *national biodiversity strategy* was introduced in 2004 to help meet national, European and global challenges. In 2003, France created an ecological protection zone in the Mediterranean, extending more than 100 km off the coast.

However, major challenges remain. First, ratification of the biodiversity convention requires the introduction of mechanisms for the conservation of species, ecosystems and genetic characteristics. Several measures for the conservation of *species* and *habitats* exist, but relatively few for ecosystems and genetic diversity. Second, despite significant progress, application of the *EU directives* on birds and habitats is still patchy. Implementation of the *Natura 2000* network is lagging even after a decision against France by the European Court of Justice. The scientific, budgetary and institutional resources devoted to conserving *biodiversity in the overseas départements* are not proportionate to the exceptional wealth of that biodiversity. The Guadeloupe National Park, created

in 1989, is still the only overseas national park, though other projects have been put forward. Conservation mechanisms cannot cope with the great pressure on *coasts and mountains*. For example, the Coastal Conservatory needs to step up its programme of land acquisitions (it now holds 12% of the coastline) and the law on coastal development needs to be consolidated and strictly enforced. The integration of biodiversity concerns into farming, forestry and tourism policies needs to continue. Intensive farming remains a source of considerable stress on biodiversity: farmland ecosystems contain France's largest number of endangered species. Greater recognition should be given to the *economically important ecological services* that biodiversity offers, especially as regards land use and prevention of environmental risks such as flooding and climate change.

Recommendations:

- integrate *biodiversity concerns into sectoral policies* (dealing with farming, forestry, tourism and land use planning) in accordance with the national biodiversity strategy, and periodically evaluate progress on action plans;
- increase the integration of biodiversity concerns into *local decisions* relating to economic development, land use planning, infrastructure and tourism activities;
- continue to expand *protected areas*, especially through extension of: i) the network of protected areas under Natura 2000 to 15% of Metropolitan France; ii) marine areas; and iii) protected areas in overseas départements;
- seek out and improve partnerships to build consensus regarding the issues at stake in connection with the EU *directives on habitats and birds* and the *Bern Convention*;
- enforce the *coastal law* more strictly and speed up the *Coastal Conservatory's* land acquisitions by significantly increasing its budget to achieve the targets for the metropolitan coastline (200 000 hectares in 30 years); give the Conservatory an objective and resources that match the scale of the coastline challenges in overseas départements; continue to draw up and implement *marine enhancement plans* for the main coastal regions, in particular by introducing monitoring mechanisms;
- take *landscape* protection into account in sectoral policies and sectoral decisions at national and local level, and increase government assistance for the management of major sites;
- organise and increase the *resources for studies* on biodiversity (e.g. at the Natural History Museum, at the French Institute for the Environment, and in the overseas départements); increase *funding for nature conservation*, including by adjusting local taxation and finance.

2. Towards Sustainable Development

The integration of environmental concerns into economic, social and sectoral decision making is essential to improving environmental performance and moving towards sustainable development. Such integration, whether effected through institutions or through market mechanisms, is also needed to achieve *cost-effective responses* to environmental challenges. Economic forces and changes in such major sectors as energy, industry, agriculture, transport and tourism strongly influence environmental conditions and trends, and hence can either enhance or diminish the benefits of environmental policy.

Integration of environmental concerns in economic decisions

France has successfully *decoupled* several environmental pressures from economic growth, including SO_x and NO_x emissions, freshwater abstraction and pesticide and nitrogenous fertiliser use. Several major *institutional and legislative reforms* have been made since 1996 to assure better integration of economic and environmental objectives and to promote sustainable development. The national sustainable development strategy was approved in 2003. The authorities apply the polluter pays and user pays principles, so both direct and indirect subsidies for environmental protection are generally minimal. The new EU directive on *strategic environmental assessment*, together with better environmental impact assessment procedures, should help improve integration in programmes and plans as well as projects. The National Health and Environment Plan is a major step forward, as is the integrated risk management policy. Other progress includes the elimination of environmentally harmful *subsidies* (with the end of coal support) and the introduction of cross-compliance in farm support. The recent reforms of the EU's Common Agricultural Policy have also tended to dissociate farm subsidies from environmental pressures. Environmental decision making has been made more coherent through various *consultation mechanisms* (e.g. the National Commission for Public Debate, the 2003 national sustainable development strategy and preparation of the water development and management master plans) and through joint management mechanisms (e.g. territorial contracts on coastal areas and Natura 2000 sites).

The implementation of the *national sustainable development strategy* could usefully focus more on market-led integration of environmental concerns in such economic sectors as agriculture, transport, energy and tourism. Many *price signals* are inadequate, given, for example, the long-term decline in real fuel prices, the continued tax advantage of diesel over petrol (to the benefit of road

hauliers) and reduced prices for water used in agriculture. Radioactive waste management (e.g. in the very long term) should be fully built into the cost of nuclear power so as to reflect relative costs. In the current state of knowledge, the nuclear sector's external costs (e.g. radioactive waste management) are only known in their broad outline. In this context, the major service providers have taken steps to meet those costs that are presently known and measurable. Most decisions about *subsidies* are still based on availability of financial resources rather than expected environmental or economic outcomes. *Taxes* take little account of environmental externalities, and some aspects of transport and energy taxation are harmful to the environment. Problems remain, especially at *local level*, with integrating environmental concerns into economic decisions and with achieving economic efficiency in implementing environment policies. Growth in *road transport of goods* continues to be a major cause for concern.

Recommendations:

- continue to reform existing *environmental taxes* to take better account of environmental externalities and eliminate the environmentally harmful aspects of *energy and transport taxation*;
- continue efforts to *reduce environmentally harmful subsidies*, and systematically examine all types of *support programme* from the standpoint of their net impact on environmental effectiveness and economic efficiency;
- ensure that national and EU policies relating to *environmental impact assessment and strategic environmental assessment procedures* are fully implemented, including at subnational level;
- more explicitly integrate an economic dimension when implementing the *national sustainable development strategy*, and promote integration of environmental concerns into sectoral policies (e.g. for agriculture, transport and energy);
- strengthen the role of *indicators* in measuring environmental and sustainable development progress and in policy formulation;
- set up a network of regional and national environmental authorities to manage EU *structural funds* with the aim of better integrating the environment and sustainable development into regional policies and programmes.

Integration of environmental and social concerns

Concerning *employment*, the "New Services, Youth Employment" programme introduced in 1997 encouraged the creation and contributed to the viability of environmental jobs, especially with local authorities and NGOs. France has also made great efforts to ensure that the most disadvantaged people have *access to essential goods like water and electricity*, and to this end is reorganising various solidarity funds and has introduced social tariffs that do not significantly distort price signals. Concerning *health*, the establishment of the French Agency for Environmental Health Safety (AFSSE) in 2001 and a review of links between the environment and health paved the way for the *National Health and Environment Plan* in 2004. It aims to reduce and prevent health risks connected with the environment in the broadest sense (including the outdoor and indoor environment and the work environment). Long experience with environmental *information* (e.g. state of the environment reports, publication of economic data on the environment, environmental indicators) and effective and improved monitoring ensure that information is actively disseminated. The *right of access to environmental information* is enshrined in French law and can be invoked in court; the Environmental Charter will give it constitutional force. Under the 2001 Law on New Economic Regulations, listed companies are required to account in their annual reports for the social and environmental consequences of their activities. The *National Commission for Public Debate*, set up in 1997 as a tripartite, independent administrative body, conducts public consultation at an early stage of proposed infrastructure projects and land use change. Several times in recent years, public consultation has been extended to draft legislation and policy formulation, for instance on energy, climate and water.

Nevertheless, the solidarity funds designed to *give disadvantaged people access to essential goods* like water and energy do not have enough money to provide long-term support. Despite the creation of AFSSE, expertise remains too limited to cover a remit as extensive as environmental health. Primary and secondary schools have lacked ambition and organisation in *environmental education*, though the situation is improving. There is a *mismatch between types of environmental training* and actual environmental employment. Although most legal rules relating to environmental information are consistent with the corresponding international texts, transposing the related new EU directive into French law will require fresh *compliance* efforts. Implementing this directive and the Aarhus Convention will require better-organised access to information and improved responsiveness to public requests. The public still needs to be better informed about its *right of access to information.* Web sites are often unclear to

inexperienced users; a national environmental information portal could improve the effectiveness, efficiency and use of the information available. More extensive environmental information on subjects such as industrial waste and biodiversity would be helpful.

Recommendations:

- continue to promote environmental protection through proactive *employment* policies involving measures such as job creation and assuring a better match between training and employment;
- continue to improve solidarity funds for *access to essential goods* (water, energy, housing) by encouraging effective, long-term personal support; ensure that the planned water law favours access to water;
- continue to strengthen the *environmental health* sector by reinforcing expertise (e.g. develop training and research);
- free up the necessary resources to implement the *National Health and Environment Plan*, including the assessment of risks related to chemical products;
- pursue efforts to ensure that legislation on *access to environmental information* complies with recent EU directives, and take the necessary steps to implement the directives and the Aarhus Convention; better inform the public about its right of access to environmental information;
- continue to improve the co-ordination of information systems and the coverage and *quality of environmental data*, and increase the accessibility and use of such data in the development and monitoring of public policies;
- increase *environmental education* in primary and secondary schools.

Sectoral integration: energy

France's *energy intensity* has continued to decrease steadily since the previous OECD review, especially in industry. The decrease is due to productivity gains and improved energy efficiency, stimulated since 1998 by incentives, regulation and information. A particular effort has been made in the case of small and medium-sized enterprises, through the Environment and Energy Management Agency. In addition, emissions of the *main air pollutants* have declined significantly in energy generation, which is all the more remarkable as the electricity supply is 90% non-thermal (78% nuclear, 12% hydroelectric and other renewable sources). France's *energy policy*

objectives have not changed since 1996. The national debate in 2003 revealed a quasi-consensus on the main energy concerns (security of supply, energy competitiveness, respect for the environment, solidarity between regions and with the disadvantaged), culminating in a white paper and a framework energy bill currently before the Parliament. The main thrusts of the bill are a policy of energy conservation and efficiency, diversification of energy sources and the preservation from 2020 of all energy options, including that of nuclear power. In institutional terms, in 2002 the supervisory aspects of *nuclear safety and radiological protection* were combined in a single body, the Nuclear Safety Authority, and the corresponding expertise was concentrated in the Radiological Protection and Nuclear Safety Institute. This marks a step forward in the consideration given to risks related to nuclear power stations for those who work in them and for the general public. France has a long tradition of planning in energy and in the *framing and evaluation of government policy*. The energy outlooks and assessments prepared during the review period by bodies like the Directorate-General for Energy and Raw Materials of the Ministry of Economy, Finance and Industry, the Planning Commissariat, the Economic Analysis Council and the Parliamentary Office for the Evaluation of Scientific and Technological Choices provided a very useful contribution to decision making.

Recommendations:

- increase efforts to make an *economic valuation of environmental damage* caused by the energy sector so as to better internalise external costs in energy prices;
- step up efforts to *save energy*, with due attention to the cost-effectiveness of the measures taken;
- undertake economic analysis of government policies to promote *renewable energy sources* so as to minimise the cost to society;
- reform *energy taxation* to better integrate environmental concerns (e.g. continue moving towards balanced taxation on diesel and petrol, abolish the tax on hydroelectricity); set up a green tax commission;
- assess the potential environmental consequences of *liberalising the gas and electricity* markets; introduce safeguards if necessary;
- continue to make the *nuclear sector* more transparent, including through greater access to information.

Despite this progress, the energy intensity of the French economy remains slightly higher than the OECD Europe average. The situation in the *transport* sector gives particular cause for concern because of the increases in overall consumption and numbers of vehicles. Not enough is being done to *save energy*, given the many benefits that can be expected from energy conservation. Energy saving is not a research and development priority and few measures are designed to limit demand growth. Very few external costs are internalised in energy prices, as the rationale of energy *taxation* is not based on integrating environmental concerns into energy policies. Internalising these costs could substantially change the choice of energy sources. Renewable energy sources offer many benefits to society, but factors such as the number of administrative permits needed, delays in issuing them and the absence of a one-stop subsidy-granting body hinder the penetration of *renewable energy sources* such as solar power. Some NGOs charge that *consultation* in the public debate preceding the drafting of the framework energy bill was insufficient and biased.

3. International Commitments

Since 1996 France has continued to play an active role in the preparation of *global agreements* on environmental protection and sustainable development, in the development of international environmental law and, more generally, in the strengthening of international environmental governance. Climate change, biodiversity, water and the marine environment are explicit priorities. Regarding *climate change*, France has stabilised its greenhouse gas emissions in accordance with the UNFCCC. It has partly decoupled CO_2 emissions from GDP growth, mainly through emission reductions in the industry and energy sectors and the growing share of services in the economy. CO_2 emissions per unit of GDP are low. France is on its way towards meeting its Kyoto Protocol targets. Concerning *transboundary pollution*, France has more than met its objectives under the Convention on Long-range Transboundary Air Pollution and its Oslo, Sofia and Geneva Protocols, considerably reducing its emissions of NO_x, SO_x and NMVOCs. It has helped strengthen European and global *agreements on maritime safety* and regularly monitors its exclusive economic zone, devoting significant institutional and material resources to combating accidental marine pollution. France is engaged in a proactive policy to eliminate illicit discharges from ships. An innovative protection zone for cetaceans, partly in the open sea, has been created in the Mediterranean, as well as an ecological protection zone. France ranks eighth among OECD countries and first among the G7 countries in terms of *official development assistance* as a proportion of GNI (0.41%). It seeks

to integrate environmental considerations into its aid projects and is a leading contributor to multilateral environment funds. It has taken several practical steps since 2000 to better integrate environmental considerations into decisions on applications for *export credits and credit guarantees*.

However, France could improve its results with regard to the fulfilment of several *international environmental commitments*. Measures in connection with the greenhouse effect must be strengthened; the efficiency of the measures could be reviewed, especially as regards the contribution of the transport sector and the balance between internal measures such as taxation and external measures such as emission permit trading in Europe and other flexible mechanisms. Between 1996 and 2002 France did not meet its international commitments as a *port state*: fewer than 25% of foreign vessels were inspected in French ports to verify compliance with IMO standards, though this was corrected in 2003. French *ports* do not have sufficient facilities for receiving ships' waste and cargo residues. Some *fish stocks* are below safe biological limits, notably in the North Sea; recovery plans (e.g. for cod and hake) are in place. Recent objectives for transboundary air pollution under the Gothenburg Protocol and the EU directive

Recommendations:

- implement measures (e.g. taxation, emission permit trading, other flexibility mechanisms) to enable fulfilment of *Kyoto Protocol commitments*, paying particular attention to the transport sector;
- continue to increase *inspections to assure compliance with IMO standards* in vessels calling at French ports;
- pursue the establishment of port plans for *processing ships' waste* and cargo residues by assuring their co-ordination at the national level, including through better co-operation among ports and use of existing equipment, as well as harmonising charges and identifying additional facilities needed;
- encourage the preparation of management and recovery plans, in the context of EU negotiations, and continue adjusting the *fishing fleet capacity* to take account of fishery resources;
- ensure that environmental assessment of projects supported by *export credits and credit guarantees* is consistent with recommended practices (international standards or equivalent standards set by the host country);
- continue to increase the level of *official development assistance* and the emphasis placed on environmental projects.

setting national emission ceilings will require new domestic measures. Reductions of *nitrogen emissions* from agriculture will have to be stepped up if France is to meet its commitments with regard to the North Sea and the EU nitrates directive. While France generally manages to reconcile its *international trade with its environmental commitments*, progress is needed as regards border controls.

2

AIR MANAGEMENT*

Features

- Emission trends
- Air quality problems
- Health and urban air pollution
- Road transport and pollution: vehicles, infrastructure, traffic, fuel
- Economic instruments
- Urban mobility plans

* This chapter reviews progress over the last ten years, and particularly since the previous Environmental Performance Review of 1997. 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 France.

Recommendations

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

- step up measures to reduce *NO_x emissions* from transport (e.g. diesel vehicles), agriculture (diesel fuel and waste combustion), industry (chemicals, ferrous metals and food processing) and energy (thermal power generation);
- strengthen measures to limit *particulate* emissions (e.g. from wood, biomass and diesel combustion) and consider introducing ambient quality standards for *fine and ultrafine particulates* ($PM_{2.5}$ and $PM_{1.0}$);
- increase the *use of rail* for passenger and goods transport and the use of combined goods transport, in the context of a modal shift framework policy based on improved internalisation of road transport externalities;
- implement *urban mobility plans*, increase the use of *economic instruments* in urban transport (notably as regards private vehicle parking and use) and introduce measures to improve emissions from heavy vehicles (e.g. bus traffic, transport of goods and waste);
- examine the impacts of *maritime, inland waterway and air transport* (including emissions from international journeys) on regional air quality and consider national or international measures to reduce them.

Conclusions

Since 1990, France has made progress in *reducing emissions* of most conventional pollutants, heavy metals and organic compounds and in decoupling them from economic growth. Emissions per unit of GDP are generally significantly lower than OECD averages, and in some cases (e.g. CO_2) among the lowest. This performance reflects not only the structure of the country's economy and energy resources but also environmental action through legislation (e.g. the 1996 Law on Air and Energy Efficiency), regulation (e.g. of classified installations) and economic instruments (e.g. taxes on polluting activities). France is a *determined player* on the international stage, complying with and sometimes exceeding its many commitments. For *vehicle emissions*, EU standards enable fleet improvement. Measures have been taken to promote use of cleaner fuels, for example by reducing the tax on *liquefied natural gas*. New transport and planning policies at municipal and regional levels (e.g. *urban development plans*) involve measures such as widespread imposition of parking fees, more efficient public transport and increased use of natural gas. In *structural terms*, the transport sector includes a high-speed train network for passenger transport, a toll trunk motorway network and urban public transport largely financed by companies.

This progress notwithstanding, several challenges remain, mainly concerning ozone, NO_x and fine particulates, which adversely affect health. A great deal remains to be done to reduce particulate emissions from diesel vehicles and wood heating, and NO_x emissions from transport, to solve urban air quality problems and meet emission reduction targets for 2010. In addition, dioxin emission levels must be further decreased, and steps must be taken to prevent any increase in emissions of *ammonia* from farming and to control emissions of *hexachlorobenzene*. Integration of environmental and air quality concerns in the transport sector remains a major challenge. Improvements to the *road vehicle fleet* must continue and accelerate, for instance through technological improvements to diesel vehicles, two-wheeled motor vehicles and goods vehicles. Local and regional *urban and transport management plans* must be put into effect. Greater use could be made of *economic instruments* (e.g. parking fees, congestion charges, taxation of vehicles and vehicle use, fuel taxes), in an EU framework where appropriate. In *structural terms*, the externalities associated with road transport need to be internalised, especially as regards transport of goods and of waste. Higher priority should be given to rail and combined goods transport. Greater attention should be paid to emissions from maritime, inland waterway and air transport. More generally, air quality concerns need to be better integrated into energy, agriculture and tourism policies.

♦ ♦ ♦

1. Objectives

1.1 International objectives

France has committed itself to reducing emissions of SO_2, NO_x, volatile organic compounds (VOCs), ammonia, heavy metals and persistent organic pollutants (POPs). Moreover, France is one of the countries that have ratified all protocols of the 1979 *Geneva Convention on Long-range Transboundary Air Pollution* (Table 2.1) except the Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone, which is not yet in force. In keeping with the protocol, however, France has already adopted emission ceilings for SO_2, NO_x, VOCs and ammonia (400 kt, 860 kt, 1 100 kt and 780 kt, respectively) for 2010.

France had a significant influence on the preparation of the European Union directives that now form the bulk of French air pollution legislation, such as the directive on integrated pollution prevention and control (IPPC). Three directives relating to *ambient air quality* set limit values for a range of pollutants, including

SO_2, particulates (PM_{10}), nitrous oxide (NO_2), carbon monoxide (CO), lead, benzene and ozone (Table 2.2). A fourth (and last) daughter directive currently being adopted deals with polycyclic aromatic hydrocarbons (PAHs) and heavy metals.

EU directives also regulate *air pollution from industrial sources* and set precise parameters for NO_x and SO_2 emissions from large combustion plants. Following adoption of the Gothenburg Protocol, in the effort to abate acidification and eutrophication,

Table 2.1 **EU and other international commitments**

Pollutants	Protocols and EU directives	Objectives		Reductions achieved or current level	
		Reduction (%) or ceiling (kt)	Period or year	Reduction (%) or 2001 emissions (kt)	Period or year
SO_2	Helsinki[a]	*–30*	1980-93	*–66*	1980-93
	Oslo[a]	*–74*	1980-2000	*–80*	1980-2000
	Gothenburg[a, b]	*–68*	1990-2010	*–60*	1990-2002
	2001/81/EC ceilings	375 kt	2010	537 kt	2002
NO_x	Sofia[a]	*0*	1987-94	*–5*	1987-94
	Gothenburg[a, b]	*–54*	1990-2010	*–29*	1990-2002
	2001/81/EC ceilings	810 kt	2010	1 352 kt	2002
VOCs	Geneva[a]	*–30*	1988-99	*–34*	1988-99
	Gothenburg[a, b]	*–56*	1990-2010	*–38*	1990-2002
	2001/81/EC ceilings	1 050 kt	2010	1 542 kt	2002
Ammonia	Gothenburg[a, b]	*0*	1990-2010	*0*	1990-2002
	2001/81/EC ceilings	780 kt	2010	778 kt	2002
Heavy metals	Aarhus[a]				
Cadmium		*0*		*–39*	
Lead		*0*	1990-tbd[d]	*–95*	1990-2002
Mercury		*0*		*–54*	
POPs[c]	Aarhus[a]				
Dioxins/furans		*0*	1990-2005/11	–78	1990-2002
PAHs		*0*		*–15*	
PCBs		*0*		*+5*	

a) Protocol to the Geneva Convention on Long-range Transboundary Air Pollution.
b) The "multi-pollutant, multi-effect" Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-Level Ozone is not yet in effect. France signed it in 1999 and the EU adopted it in June 2003.
c) Eleven pesticides, two industrial chemical products and three sub-products. Production ban: aldrine, chlordane, chlordecone, dieldrine, endrine, hexabromobiphenyl, mirex and toxaphene. Restricted use and long-term elimination: dichloro-diphenyl-trichloroethane (DDT), hexachlorocyclohexane (HCH, including lindane) and polychlorinated biphenyls (PCBs). Reduced emissions: dioxins, furans, polycyclic aromatic hydrocarbons (PAHs) and hexachlorobenzene (HCB).
d) tbd: to be determined.
Source: CITEPA; OECD (2004); Environmental data, Compendium 2004.

directive 2001/81/EC set national emission ceilings for SO_2, NO_x, VOCs and ammonia (375 kt, 810 kt, 1 050 kt and 780 kt, respectively), to be met by 2010 (Table 2.1). These ceilings are slightly stricter than the Gothenburg Protocol limits.

Concerning EU directives related to *transport*, France is implementing those on petrol and diesel vehicle emissions, fuel quality (in terms of lead, benzene and sulphur) and emissions from motorised two-wheeled vehicles and non-road vehicles (e.g. for farming and forestry).

1.2 National objectives

France's emission reduction plan and the 2004 *National Health and Environment Plan* call for reducing, by 2010, dioxin emissions by 85%, cadmium by 50%, lead by 65%, vinyl chloride monomer by 40%, benzene by 35%, diesel particulates from moving sources by 33% and NO_x and VOCs from industrial installations by 40%.

As regards *CO_2 emissions*, even before the adoption of the United Nations Framework Convention on Climate Change (UNFCCC), France had set a target of cutting emissions to two tonnes of carbon per inhabitant per year by 2000. For implementation of the Kyoto Protocol, emission levels in 2010 must not exceed the levels in 1990.

Table 2.2 **EU ambient air quality standards[a] for protection of human health**

	Average value	Limit ($\mu g/m^3$)	Max. number of overruns/year	Implementation
SO_2	Over 1 hour	350	24	2005
	Daily	125	3	2005
PM_{10}	Daily	50	35	2005
	Annual	40	0	2005
NO_2	Over 1 hour	200	18	2010
	Annual	40	0	2010
CO	Over 8 hours (daily max.)	10 000	0	2005
Lead	Annual	0.5	0	2005
Benzene	Annual	5	0	2010
Ozone[b]	Over 8 hours (daily max.)	120	25	2010

a) Directive 99/30/EC for SO_2, NO_2, PM_{10} and lead. Directive 00/69/EC for CO and benzene. Directive 02/3/EC for ozone.
b) EU standards not yet transposed into French law.
Source: European Union.

1.3 Previous OECD review

Air management performance is also assessed in the light of the recommendations of the 1997 OECD *Environmental Performance Review* of France:

- draw up a national air pollution control strategy that combines a timetable setting out quantitative targets with sectoral measures whose cost-effectiveness has been assessed;
- enforce regulations more vigorously, notably by inspecting classified facilities more often and increasing the severity of administrative and criminal sanctions;
- make greater use of economic instruments for air management, notably as regards taxes levied on mobile sources;
- enhance the integration of air pollution concerns in the definition of national and local policies on land use, urban planning, energy and transport;
- continue to extend and modernise the air quality monitoring network, particularly to accommodate new concerns about fine particulate emissions and ground-level ozone;
- develop more rational pricing and taxation of transport to help internalise its environmental costs, notably by raising diesel fuel taxes and the axle tax;
- continue to encourage the provision of economically and environmentally attractive public transport systems in urban areas; introduce regulatory and pricing mechanisms to limit car use in congested areas, e.g. tolls on urban expressways, improved enforcement of parking regulations and greater use of parking fees in major cities; contribute to solving the problems of urban freight transport.

2. Air Management

Many economic activities cause air pollution. The energy sector (Chapter 7), farming and industry (Chapter 5) and transport have significant effects on air quality. Both outdoor and indoor air pollution affect health (Box 2.1, Chapter 6). Transport is also a major contributor to the greenhouse effect (Chapter 8). Moreover, air pollution management is an aspect of industrial risk management (Box 2.2).

2.1 Emission trends

Overall, France has achieved, and in some cases exceeded, its air pollution reduction objectives and fulfilled all its *international commitments* (Table 2.1).

Box 2.1 **Health and urban air pollution**

The health effects of air pollution are a source of growing concern. Allergies and respiratory ailments such as asthma are on the rise. Despite real progress in areas such as SO_2 emissions, *outdoor air quality* is still worrying because of issues including ozone and fine particulates. This is especially true in French cities, home to 44 million people, almost 74% of the population. *Indoor air quality* (i.e. in houses, vehicles, transport depots, etc.) is the subject of numerous studies.

In a study of nine French cities, the Health Monitoring Institute estimated that short-term effects of air pollution caused nearly 300 premature deaths each year. Another study estimated that long-term exposure caused 32 000 *premature deaths* in 1996, half of them attributable to transport pollution. Costs of the direct damage could be as much as EUR 5 billion a year, 60% of it attributable to pollution generated by road transport. A recent study by the French Environmental Health Safety Agency suggests that 6 500 to 9 500 deaths annually are linked to particulates in urban air (Chapter 6).

The growing use of private vehicles, including two-wheeled motor vehicles, and of commercial vehicles for *passenger and goods transport* is due to changing production and consumption patterns. The transport sector is the main culprit in deteriorating air quality, causing rising levels of *ozone, NO_x and particulates*.

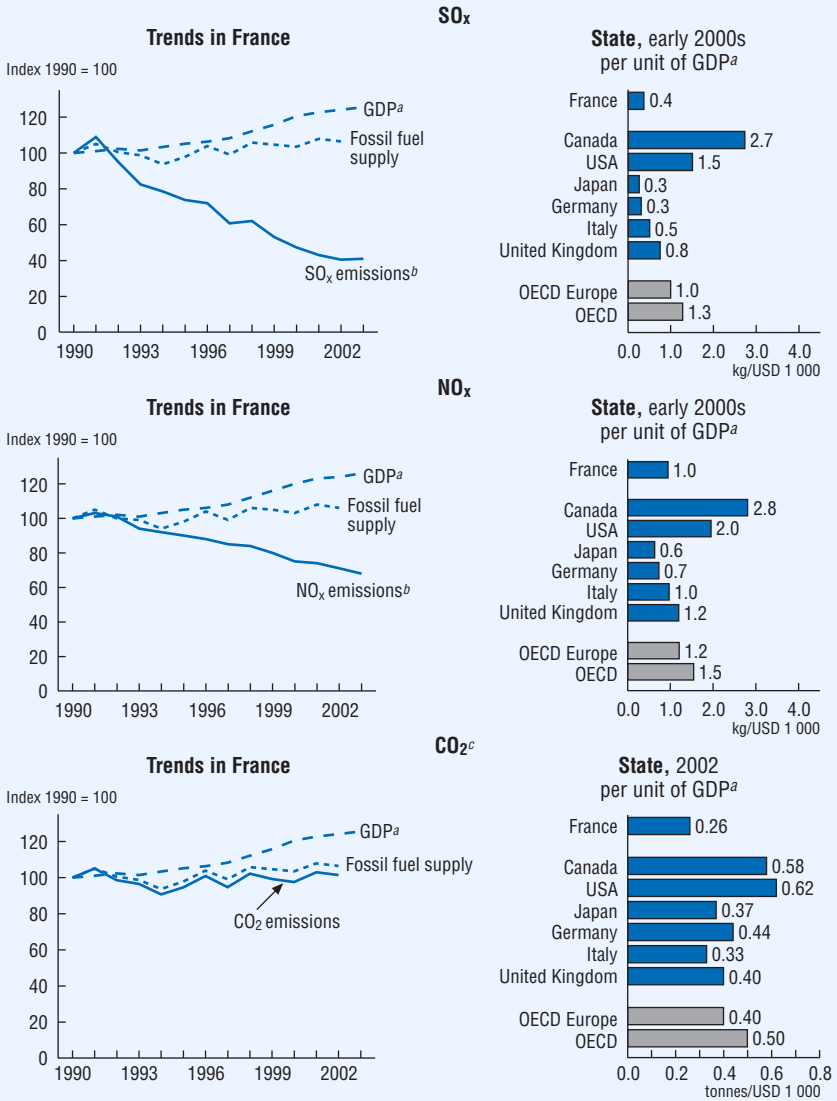
Box 2.2 **The explosion of the AZF plant in Toulouse**

On 21 September 2001, a shed at the AZF nitrogen fertiliser plant in Toulouse, containing 300 tonnes of *ammonium nitrate*, exploded. Thirty people were killed and 2 200 injured. The accident also damaged 30 000 dwellings, rendering 11 000 of them unusable, along with many public buildings, including schools and hospitals. Some 170 companies suffered severe financial hardship. Though the disaster caused no major air pollution, the pollution could have been much more serious if the explosion had hit neighbouring sites.

The exact causes of the accident have not been formally determined and responsibility has not been clearly established. Insurers have *paid compensation to the victims*: individuals account for 90% of the claims and businesses for 90% of overall compensation, which totalled EUR 1.5 billion.

France's *technology risk management policy has been tightened* as a result of the accident. Technology risk prevention plans have been introduced for high-risk sites, public information has been expanded and worker protection increased. Plans call for use of public funds to compensate uninsured victims. A cancer research centre will be built in 2006 on the decontaminated site.

Figure 2.1 **Air pollutant emissions**



a) GDP at 1995 prices and purchasing power parities.
b) 2003: preliminary estimates.
c) Emissions from energy use only; excludes international marine and aviation bunkers.
Source: CITEPA; UNECE/EMEP; IEA-OECD; OECD.

Reductions in emissions of SO_2, CO, dioxins and furans, lead, mercury, chrome and cadmium have been especially notable since 1990. Reductions have also been recorded in emissions of NO_x, VOCs, total suspended particulates (TSP) and fine particulates.

SO_x and NO_x emissions

During the 1990s and early 2000s, France continued to *strongly decouple SO_x and NO_x emissions from economic growth* (Figure 2.1). Emission intensities (kg per unit of GDP) for these pollutants in France are significantly lower than the OECD and OECD Europe averages but rank ninth and fifth, respectively, in the OECD, suggesting that there is room for improvement (Reference I.A).

SO_x emissions were cut by 60% (Table 2.3). The latest progress results from initiatives in industry to encourage the use of low-sulphur fuel. The energy and manufacturing sectors remain the biggest emitters, accounting for 45% and 34% of total SO_x emissions, respectively, in 2002.

NO_x emissions fell by 29% (Table 2.3), mainly because progress was made in the transport sector despite increases in numbers of vehicles and distances travelled per vehicle. Road transport continues to be the biggest polluter, accounting for 48% of NO_x emissions in 2002, but progress is needed in all sectors to meet the Gothenburg Protocol target of reducing NO_x emissions by 54% from their 1990 level by 2010.

Table 2.3 **Emissions of conventional air pollutants,**[a] 1990-2002

	SO_2	NO_x	NMVOC	CO	Ammonia	TSP	PM_{10}	$PM_{2.5}$	$PM_{1.0}$
1990	1 326	1 897	2 499	10 947	779	1 618	621	361	269
1995	978	1 704	2 107	8 913	766	1 425	559	323	242
2000	627	1 431	1 719	6 624	784	1 478	535	290	209
2002	537	1 352	1 542	5 954	778	1 475	518	275	195
% change (1990-2002)	*–60*	*–29*	*–38*	*–46*	*0*	*–9*	*–17*	*–24*	*–28*

a) In kilotonnes. Under UNECE and UNFCC definitions, international maritime and air emissions, and emissions from biotic and non-anthropic sources, are not included.
Source: CITEPA.

Emissions of other pollutants

Particulate emissions fell during the 1990s and early 2000s (Table 2.3). The biggest reductions, for $PM_{2.5}$ and $PM_{1.0}$, were due to a decline in mining. Wood and diesel combustion are now the main sources of $PM_{2.5}$ and $PM_{1.0}$ emissions, accounting for over half. Manufacturing and farming combined were responsible for 82% of TSP emissions in 2001.

VOC and CO emissions fell by 38% and 46%, respectively, mostly as a result of the introduction of new standards and equipment (e.g. catalytic converters for cars) in transport and manufacturing (Table 2.3). Manufacturing (31%), road transport (24%) and the residential/commercial sector (22%) contributed most to VOC emissions in 2002. France will have to take additional measures to meet the Gothenburg Protocol target of reducing VOC emissions by 56% in 2010 in relation to 1990.

Ammonia emissions remained stable at 780 kt (Table 2.3), with 98% of the emissions related to farming. France will have to ensure that it maintains this level to meet the Gothenburg Protocol requirements in 2010.

Emissions of all *heavy metals* except selenium and copper fell (Table 2.4). The most dramatic reduction (95%) was due to the phasing out of leaded petrol. Mercury emissions also fell substantially, by 54%.

Table 2.4 **Emissions of selected air pollutants,**[a] 1990-2001

	Organic compounds				Heavy metals								
	Dioxins/ furans	PAH	PCB	HCB	As	Cd	Cr	Cu	Hg	Ni	Pb	Se	Zn
	g ITEQ[b]	Tonnes	kg	kg	Tonnes								
1990	1 741	293	61	1 655	28.4	15.8	396	168	25.3	318	4 264	13.8	2 031
1995	1 684	271	60	1 788	24.7	13.0	211	175	21.0	259	1 446	13.7	1 371
2000	526	256	43	1 799	25.3	10.4	259	177	13.4	222	247	14.3	1 442
2002	380	251	38	1 745	24.5	9.6	242	178	11.7	192	217	14.2	1 339
% change (1990-2002)	*–78*	*–14*	*–38*	*5*	*–14*	*–39*	*–39*	*6*	*–54*	*–40*	*–95*	*3*	*–34*

a) Under UNECE and UNFCC definitions, international maritime and air emissions, and emissions from biotic and non-anthropic sources, are not included.
b) International toxic equivalent.
Source: CITEPA.

As regards *POPs*, dioxin and furan emissions decreased by 78%, but France was the biggest emitter of dioxins among the 15 EU countries in 2002, with incineration and wood heating accounting for 45% of its total. Between 1990 and 2002, France achieved smaller reductions in emissions of PAHs and PCBs. Except for HCB, France is well on the way to meeting the Aarhus protocols' emission reduction targets for heavy metals and POPs.

CO_2 emissions

France ranks third-lowest among OECD countries for *CO_2 emissions per unit of GDP* because of: i) the relatively low energy intensity of its economy; ii) energy conservation efforts; and iii) the shares in its electricity supply of nuclear power (78%) and hydropower and other renewable forms of energy (11.5%). Emissions rose by 1% over 1990-2002, and only weak *decoupling* of CO_2 emissions and GDP took place. Transport's share in CO_2 emissions rose over the period, to 37% (road transport accounted for 35%) (Figure 2.1). The residential sector was responsible for 20% of emissions, manufacturing for 21%, energy transformation for 15% and farming, the tertiary sector and public services for 7%.

2.2 Air quality trends

Despite all this progress, *ambient concentrations of pollutants are still a cause for concern*, especially in urban areas. Air quality in major conurbations is assessed daily using the *ATMO index*, which measures concentrations of SO_2, NO_2, ozone and TSP. Since 1998, the index has been made public through various media (written press, TV, radio, Internet), giving same-day and next-day forecasts.

The EU Framework Directive on Ambient Air Quality Assessment and Management (96/62/EC) requires establishment of a *monitoring network*, especially for urban areas of more than 250 000 inhabitants. France has implemented the directive and the recommendations in the latest OECD report on extending and modernising the air quality monitoring network. Monitoring is carried out by 40 associations, 330 officials (compared with 130 in 1996) and 2 200 instruments (compared with 1 350 in 1996) on 700 measurement sites, most of them in urban or industrial areas. The 58 conurbations with over 100 000 inhabitants are continuously monitored for SO_2, NO_2, CO, particulates, lead, ozone, benzene, hydrocarbons and heavy metals.

Ambient air pollution levels, defined for the country as a whole, are, in descending order: alert thresholds, information and recommendation thresholds, limit values and quality objectives. Alert thresholds, limit values and at least one quality objective (SO_2)

derive from EU legislation. The limit values, for instance, are those that the EU will apply from 2005 and 2010 (Table 2.2). When information and recommendation thresholds are reached, the public is notified and instructions are issued to mitigate possible health effects. At the alert threshold certain activities, including car driving, are prohibited or restricted. Information thresholds (hourly averages) are 300 $\mu g/m^3$ for SO_2, 200 $\mu g/m^3$ for NO_2 and 180 $\mu g/m^3$ for ozone. Alert thresholds are 500 $\mu g/m^3$ for SO_2, 400 $\mu g/m^3$ for NO_2 and (a new threshold) 240 $\mu g/m^3$ over three hours for ozone.

For *concentrations of NO_2*, although the national annual average has fallen, averages in urban areas range from 14 $\mu g/m^3$ at Lorient to 49 $\mu g/m^3$ at Cannes-Grasse-Antibes. Some regions still exceed the World Health Organization standard for annual average concentration (40 $\mu g/m^3$). In 2001, hourly quality objectives (< 50 $\mu g/m^3$ at the 50th percentile) were exceeded in some 30% of the monitoring network. Montpellier, Marseille and Lyon were the urban areas recording the most days with hourly averages exceeding the information threshold of 200 $\mu g/m^3$ (71, 22 and 16, respectively).

Ground-level ozone can affect human health (Box 2.1) and vegetation. It is the main cause of alerts in urban and peri-urban areas. Between 2000 and 2004, the alert threshold of 360 $\mu g/m^3$/hour was exceeded for six consecutive hours on four separate days. Even leaving aside seasonal peaks (two alerts in 2003 due to exceptional climatic conditions), the underlying ozone level increased over 2001-03. In 2001, every region of France but one exceeded the eight-hour quality objective (110 $\mu g/m^3$) and the future EU limit (120 $\mu g/m^3$ in 2010) with levels of around 150-160 $\mu g/m^3$, and as much as 220 $\mu g/m^3$ in Basse-Normandie. The objective for *particulates* (annual average of 30 $\mu g/m^3$ for PM_{10}) is in line with the World Health Organization objective and stricter than the EU objective of 40 $\mu g/m^3$. A majority of the regions have achieved the objective, the exceptions being Aquitaine, Auvergne, Île-de-France, Lorraine, Nord-Pas-de-Calais, Provence-Alpes-Côte d'Azur and Rhône-Alpes. In urban areas, the rise in numbers of diesel vehicles is increasing health risks (Box 2.3 and Chapter 6).

Although objectives for SO_2 emissions have been more than met, *concentrations of SO_2* in some highly industrialised conurbations, including Le Havre, Fos-Berre and Rouen, are cause for concern. In these areas, daily quality objectives (< 125 $\mu g/m^3$) were exceeded in some 30% of the monitoring network in 2001, with peaks of 400-600 $\mu g/m^3$.

As regards *carbon monoxide*, France has achieved its objective of less than 10 000 $\mu g/m^3$ over an eight-hour period (daily maximum).

Box 2.3 **Transport sector in France**

France's transport *infrastructure* includes 11 000 kilometres of *motorways*, built and operated as concessions by private or semi-public companies and financed by tolls on intercity motorways and by government subsidies for urban motorways. For the *rail system*, the infrastructure management (Réseaux ferrés de France, RFF) is separate from the operation of transport services (French Railways/SNCF). RFF and SNCF are state-owned industrial and commercial entities. The rail network is being extended, especially with high-speed lines. A high-speed link between Paris and Marseille has been opened, the TGV Est to Eastern France and Germany is under construction and other projects have been confirmed, including a link from Lyon to Turin (Italy) and from Perpignan to Figueras (Spain). High-speed links with the UK, Belgium and the Netherlands already exist. Two "*motorway of the sea*" projects are under way: in addition to cabotage, they will offer alternative routes for goods transport over the Alps and Pyrénées. Concerning *urban transport*, many cities are developing their own local solutions, such as metros and tramways.

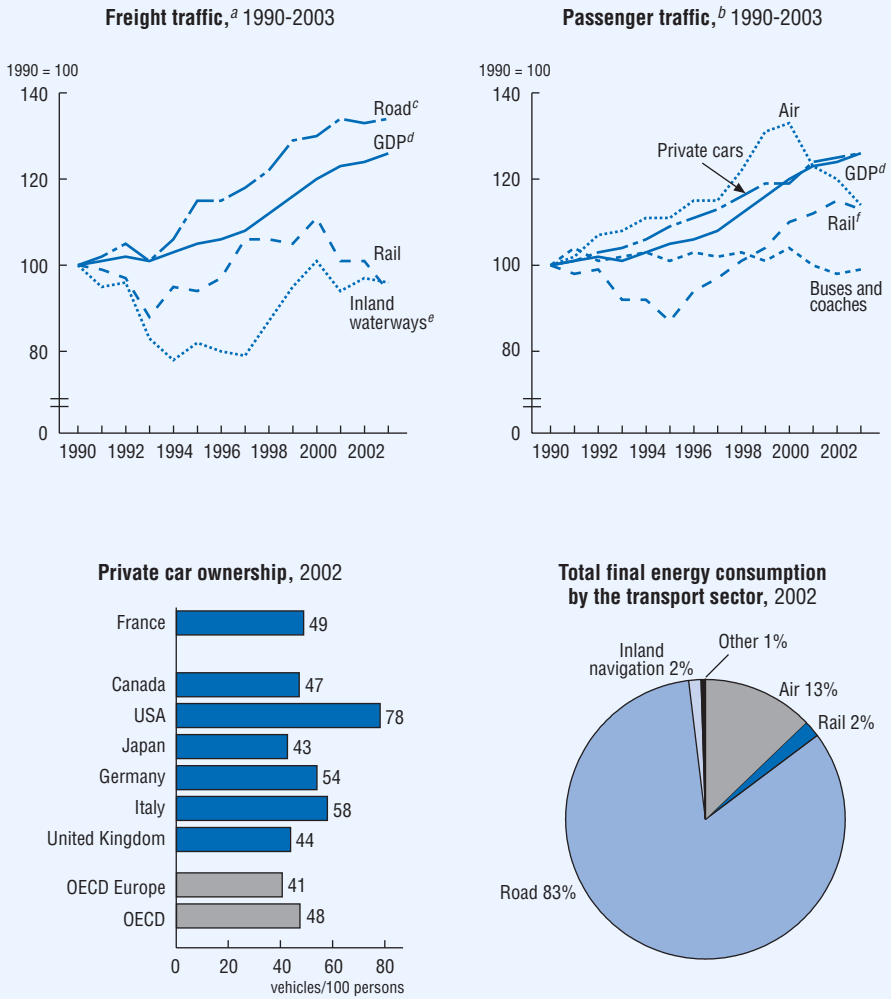
The *number of vehicles on the roads* (30 million private cars and 6 million trucks) is increasing and the proportion of diesel-engined vehicles has risen sharply. There are 18 million diesel vehicles in France, and diesels account for 68% of private car sales, an increase of 34% in 13 years.

Regarding the *movement of goods and persons*, road transport predominates and is growing (Figure 2.2). For passenger transport, private cars account for 739 billion passenger-kilometres and the railways 83 billion. For goods, road transport represents 210 billion tonne-kilometres and rail 47 billion. Efforts are being made to encourage combined transport for goods.

Fuel quality is governed by EU legislation. Leaded petrol was taken off the market in 2000. Future improvements to petrol and diesel will reduce VOC and sulphur (for the latter the objectives are 50 ppm in 2005 and 10 ppm in 2009). The price difference between diesel and petrol in France is one of the greatest in the EU, mainly because of the differing taxes imposed. The difference was supposed to be gradually eliminated from 1999, but the plan was temporarily shelved following a rise in oil prices.

The *financing* of the transport sector is distorted because revenues do not cover full costs, especially for infrastructure and externalities such as noise, accidents, pollution, congestion and effects on the landscape. The costs generated by transport are estimated at 7% of GDP. Revenue comes mainly from fuel taxes, tolls, the axle tax and the road tax (which still exists for commercial vehicles). Urban public transport is largely funded from tax revenue and a transport charge paid by city-based businesses and public-sector bodies with more than nine employees.

Figure 2.2 **Trends in the transport sector**



a) Index of relative change since 1990 based on values expressed in tonne-kilometres.
b) Index of relative change since 1990 based on values expressed in passenger-kilometres.
c) Traffic of national vehicles > = 3 tonnes (> = 3.5 tonnes from 2002).
d) GDP at 1995 prices and purchasing power parities.
e) Excluding Rhine transit.
f) SNCF only.
Source: Ministry of Capital Works and Transport; ECMT; AAMA; IRF; OECD.

2.3 Framework for action

France has introduced several *laws to control air pollution* within its borders. Broad objectives are set out in a 1961 law to reduce atmospheric emissions and in a 1976 law (which anticipated the EU's IPPC directives) on *classified industrial installations*, featuring integrated pollution management. Since 1996, the *Law on Air and Energy Efficiency*, known as LAURE, has defined France's objectives with regard to air quality, pollution thresholds at which public health is in danger and air pollution monitoring requirements. These measures, along with the establishment of the National Air Council and the national programme to reduce atmospheric emissions of SO_2, NO_x, VOCs and ammonia, are good examples of initiatives aimed at developing a national air pollution strategy and are consistent with the 1997 OECD recommendation.

France has also significantly *tightened enforcement of regulations*, as the 1997 report recommended. Inspections of classified installations are more frequent and administrative and judicial sanctions stronger. The authorities have increased the number of inspectors by 50%, from 743 in 1996 to 1 119 in 2004, and introduced closure procedures (200 in 1997, 439 in 2002).

Spending on measures to reduce air pollution was little changed from 1990 to 1996, then increased after LAURE was adopted, reaching EUR 1.61 billion in 2002 compared with EUR 1.37 billion in 1990. The monitoring network was significantly reinforced, as was its budget. In 2002, 40 approved air quality monitoring associations had a combined budget of EUR 40.6 million, up nearly 20% on the previous year.

In 1999, a new *general tax on polluting activities* (TGAP) consolidated five instruments, including the air pollution tax. For air, the new tax is levied on emissions from particular classified installations, including power plants and waste incinerators, and generates some EUR 25 million per year, or 5% of total TGAP revenue. While revenue from the previous air pollution tax went to the Environment and Energy Management Agency (ADEME), income from the TGAP helps finance the health care system and the lower (35-hour) workweek. Rates, which differ for the five types of pollutants concerned (SO_x, NO_x, VOCs, N_2O, hydrochloric acid), are low: the tax represents less than one-thousandth of operating expenses for 90% of those liable, so it provides only limited incentive to cut pollution. The possibility of increasing the air pollution share of the TGAP should be considered (Chapter 5), and rates should be determined in line with the environmental damage to be internalised.

3. Integrating Air Quality Concerns in the Transport Sector

3.1 Managing air pollution from road transport

Transport volumes tend to be *extremely high* in France, as in other OECD countries: a lack of internalisation of road transport externalities (except for transport on toll motorways), combined with direct subsidies for public transport, reduces costs and hence helps increase traffic.

Road transport is the leading transport mode (Figure 2.2), representing 90% of passenger transport (in passenger-kilometres) and 79% of goods transport (in tonne-kilometres). *Road traffic is growing faster than GDP*. Private cars accounted for 78% of road traffic (404 billion vehicle-kilometres) in 2003, up 26% from 1990. Road haulage has increased by 36% (in vehicle-kilometres) since 1990. Passenger rail transport is highly developed by OECD standards; high-speed rail, for instance, competes with air transport. However, there is considerable scope for expanding goods transport by rail.

Road transport accounted for 83% of final energy consumption in the transport sector and 26% of total final energy consumption in 2002 (Figure 2.2). Most of the *air pollutants (conventional and CO_2) emitted by the sector* are therefore linked to road traffic. Emissions from vehicles sold since 1990 have been reduced quite significantly (by 60-80%) through use of catalytic converters, particulate filters, more efficient engines and stricter fuel standards. Nevertheless, road traffic still accounts for 88-100% of transport sector emissions of NO_x, CO and VOCs because the advances have been offset by large increases in vehicle numbers and use. Standards for cars are increasingly being tightened. There has been less progress on heavy goods vehicles and, above all, motorised two-wheeled vehicles, standards for which could be tightened.

The *number of private vehicles* has increased by 26% since 1990 and is likely to continue rising, as the motorisation rate in France is not among the highest in Europe (Figure 2.2). Average vehicle size is also increasing. The number of *four-wheel-drive vehicles* is rising, including in urban use. The number of *private diesel vehicles* almost tripled over the 1990s. Diesel engines are harder-wearing, use less fuel and produce *less CO_2 and fewer VOCs* than petrol engines. But they emit *more NO_x and fine particulates* (2.5 micrometers and smaller). Fine particulates pose a potential cancer risk, and both NO_x and particulates cause respiratory and heart problems and increase the risk of premature death.

Regulatory instruments

In the EU framework, France is trying to reduce *emissions from road vehicles*, both petrol- and diesel-engined. As a result of measures to assure compliance with the

Euro-I and Euro-II standards of the EU Auto-Oil Programme, by 2000, 61% of petrol-engined vehicles in France were equipped with catalytic converters (the OECD average was 67%). The Euro-III standards came into effect in 2000, and the Euro-IV standards will apply from 2005. Considerable progress has been made, and will continue to be made, in line with the rising proportion of cars meeting these even stricter standards (Table 2.5).

Reductions in the *sulphur content of diesel fuel* in accordance with EU directives partly tackles the problem of particulate emissions. Increasingly strict standards have been applied to petrol and diesel since 1994 (Table 2.6). From 2005, all fuel sold in France must meet a 0.005% sulphur content limit. Virtually sulphur-free fuel (0.001% by mass) should come on the market in 2005, and all fuel sold will have to meet that standard by 2009.

Fine particulates emitted by diesel engines can be trapped by diesel *particulate filters*, whose efficiency has improved by around 90% in recent years. The EU has not yet issued a directive that would encourage *widespread* use of such filters, despite requests from France, Germany and Sweden. There is no EU standard for emissions of fine particulates, generally considered the most harmful. More efficient "common rail" diesel engines also help reduce NO_x emissions. Thus, improved *diesel vehicle technology* could substantially reduce such emissions.

Economic instruments

Fuel taxes are higher in France than in North America but lower than in some other European countries, including Germany and the UK. The same applies to the price difference between diesel and petrol (Figure 2.3). A plan was introduced in 1999 to eliminate the price difference by 2005 by increasing the tax on diesel by EUR 0.011 per litre each year for seven years, but the increase has not been applied every year; high oil prices in 2000-01 and protests by truckers against fuel tax increases led the government to temporarily suspend the policy. The tax on diesel was raised by EUR 0.03 in 2004, but diesel is still significantly cheaper than petrol.

Moreover, an agreement between truckers and the ministry in charge of transport in 2000 exempted goods transport from any increase in diesel prices and granted an additional subsidy of EUR 0.032/litre in 2000 and EUR 0.017 in 2001, so the increase in 2004 will probably not cause any appreciable decline in diesel use. The use of economic instruments to better internalise the external environmental costs of transport should focus on *where vehicles are used* (e.g. through tolls and parking charges) and on their *environmental characteristics* (Chapter 7). Emission reduction technology, including particulate filters, can also be an effective means of reducing the health and environmental effects of particulates emitted by diesel engines (Box 2.1).

Table 2.5 **EU standards for private vehicle emissions**

(g/km)

Standards	Directives	Entry into force	CO	NO_x	HC	HC + NO_x	PM
Petrol engine							
EURO-I	91/441/EEC	1993	4.05	0.49	0.66	n.a.	n.a.
EURO-II	94/12/EEC	1997	3.28	0.25	0.34	n.a.	n.a.
EURO-III	98/69/EC	2000	2.30	0.15	0.20	n.a.	n.a.
EURO-IV	98/69/EC	2005	1.00	0.08	0.10	n.a.	n.a.
Diesel engine							
EURO-I	91/441/EEC	1993	2.88	0.78	0.20	n.a.	n.a.
EURO-II	94/12/EEC	1997	1.06	0.73	0.19	n.a.	n.a.
EURO-III	98/69/EC	2000	0.64	0.50	n.a.	0.56	0.05
EURO-IV	98/69/EC	2005	0.50	0.25	n.a.	0.30	0.025

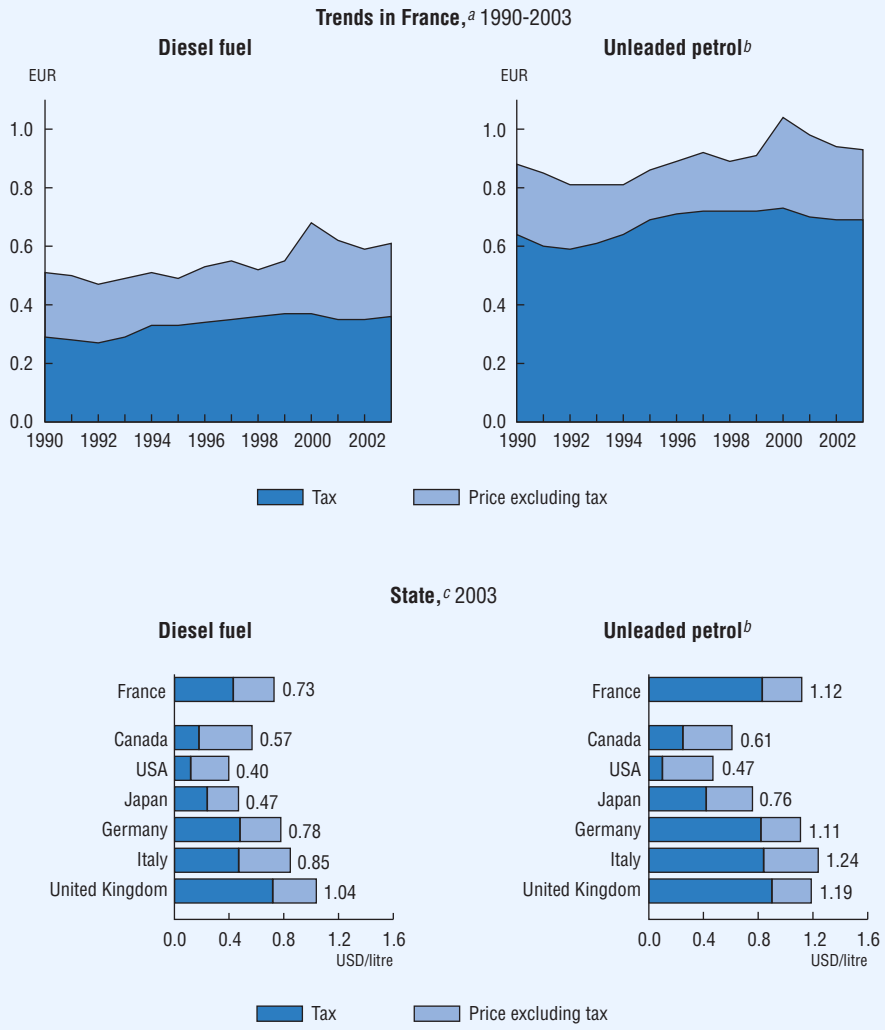
n.a. Not applicable.
Source: European Commission.

Table 2.6 **EU fuel standards: lead, benzene and sulphur**

Deadline[a]	Lead	Benzene	Sulphur	
	Petrol (g/l)	Petrol (% volume)	Diesel (% mass)	Petrol (% mass)
1991	0.15			
1994			*0.2*	
1996			*0.05*	
2000	0.005	*1*	*0.035*	*0.015*
2005[b]			*0.005*	*0.005*
2009[b]			*0.001*	*0.001*

a) All fuel sold within the EU must meet the standards no later than the year shown in the table. Directives require the standards to be introduced several years before the deadline.
b) Directive 2003/17/EC relating to the quality of petrol and diesel fuels.
Source: European Commission.

Figure 2.3 **Road fuel prices and taxes**



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

France has cut taxes on liquefied natural gas and granted partial refunds of the fuel tax on natural gas and biofuel to encourage the use of *alternative fuels*. France is now the EU's biggest producer of biodiesel, with 47% of total EU output. The French fleet of 35 million cars and vans includes 210 000 run on liquefied petroleum gas (LPG), 4 500 fuelled by natural gas, 5 000 electric and about 200 hybrid vehicles. In addition the country has some 1 500 electric mopeds and about 900 buses that run on natural gas. Tax credits are granted for the purchase of *electric vehicles*, but even so their high price and reduced autonomy kept France from achieving its target of having electric vehicles represent 5% of new registrations (100 000 vehicles) by 2000. A reform in 1998 led to a higher *axle tax on commercial vehicles*, mainly by abolishing various reductions (e.g. involving zoning, transport for own account and toll refunds) that would have prevented France from complying with EU minimum rates. The reform is consistent with recommendations in the 1997 OECD review. Taxation on heavy trucks in France is still among the lightest in the EU. The 2004 National Health and Environment Plan envisages an increase in the axle tax. Vehicles using mixed road-rail systems are eligible for a 75% flat-rate reduction in the axle tax. *Motorway tolls* continue to play an important role in financing motorway infrastructure and channelling goods and passengers to various types of infrastructure (toll roads, free roads, rail).

Until 2001, a *road tax* was payable on vehicles not liable to the axle tax. Since then most vehicles under 3.5 tonnes have been exempt if owned by individuals or legal entities possessing up to three vehicles. The exemption is not environmentally beneficial. In June 2004, the Ministry of the Environment and Sustainable Development (MEDD) proposed a *merit rating (bonus-malus) system for vehicle purchases* to partly offset the road tax exemption. The system would be based on the amount of CO_2 vehicles produce. Buyers of vehicles at the highest emission level would have to pay between EUR 400 and EUR 3 200. Those buying the lowest-emission vehicles would be entitled to a premium (negative tax) of up to EUR 700. This measure could usefully supplement the Climate Plan in the transport sector, but could also affect vehicle sales in France and other EU countries in the absence of EU-wide harmonisation.

3.2 Urban mobility plans

Increases in road traffic and the associated pollution have adversely affected environmental quality and human health, especially in urban and peri-urban areas (Box 2.1). In line with the recommendation of the 1997 OECD review on better integration of air pollution concerns in urban and transport planning, the 2000 *Law on Urban Solidarity and Renewal* extended the scope of urban mobility plans (PDUs), which were introduced by the 1982 *Framework Law on Domestic Transport* and

relaunched by *LAURE* in 1996. LAURE is geared towards controlling car traffic and restoring equilibrium among private and public transport, organising city parking and goods transport, encouraging businesses to draw up mobility plans (involving, for instance, business travel plans, car pools, subsidies for using public transport, more telecommuting) and introducing pricing, including integrated automatic charging for all travel.

The *58 urban areas* with more than 100 000 inhabitants are required to draw up PDUs. These plans' objectives include improving safety in transport, reducing car traffic, developing less polluting forms of transport, increasing existing networks' efficiency and reducing the environmental impact of goods transport. Most plans emphasise the need for *better public transport* (trams, buses and trains offering better service and shorter waits); footpaths and cycle paths that are better integrated with public transport; car parks at public transport stops; new forms of parking and payment; integrated payment for all public transport services; bus lanes; use of natural gas for public buses (LAURE requires authorities to ensure that at least 20% of new vehicles use clean fuels such as LPG, natural gas and electricity); and tighter speed restrictions to reduce NO_x emissions, especially on days when the air quality is poor. In major cities like Paris, the possibility of using tolls or permits to charge car drivers entering the city centre has been considered. The Paris city government has gradually made a *significant reduction in the road area* available for private cars and a corresponding increase in bus lanes so as to shorten bus journey times and promote public transport. It has also embarked on a policy of *charging for all on-street parking*.

Thus, PDUs should help encourage use of *urban public transport*. Progress has been made in this area since the late 1990s. For example, six new tramway lines were brought into service in 2000 in Montpellier, Strasbourg, Lyon, Nantes and Orléans. Thirteen cities now have tramways (and four more are being equipped), and Lyon, Marseille, Lille and Toulouse have underground rail systems. Extensions to existing transport networks have recently been completed in several major cities, including Paris (bus, tram, metro, rapid suburban rail). The biggest increases in road traffic, however, sometimes involve suburb-to-suburb travel, where public transport may be limited in access and extent. Part of France's substantial investment in public transport has been funded by a *transport charge* that companies pay, similar to the payments they make into the health and unemployment systems (Box 2.3). Earmarked for the development of local public transport, the charge generates almost EUR 2 billion in the Île-de-France region and EUR 1.4 billion in other regions.

By September 2002, 43 PDUs had been approved after public consultation, eight were in the consultation phase and nine were being drawn up. In addition, 60 cities with fewer than 100 000 inhabitants have voluntarily drawn up PDUs. The need to

balance traffic reduction with urban development can slow the local planning process but it compels local authorities to adopt a comprehensive approach to traffic management. It may take several years to *implement PDUs* but the process has begun and the various stakeholders have been able to address the issues together. Most urban areas have favoured increased public transport over the use of *economic instruments* such as parking fees and road charges to limit road traffic. Very little attention has been paid to assessing the *costs and benefits* of proposed measures.

Incentives to limit the *use of vehicles over 12 years old* should be considered anew. Such vehicles make up 20% of the fleet but account for 60% of CO, NO_x and hydrocarbon emissions. Their replacement could be accelerated. Restricting the use of such vehicles when pollution is high in urban areas would be three times as effective as limiting car use based on licence plates and affect a smaller proportion of the population. Account should also be taken of *two-wheeled motor vehicles*, which are subject to less stringent standards but increasingly contribute to urban pollution.

3.3 Long-distance transport

The French authorities have been active in drawing up plans to optimise *intercity transport*. The 1999 Framework Law on Regional Land-use and Sustainable Development aims to give fresh impetus to strategic spatial planning. It introduces nine public service plans, two of which concern goods and passenger transport. Legislation of 9 December 2004 simplifying French law allows the government to take whatever measures are necessary to streamline the procedures for adopting and revising the plans. Another objective is to improve the use of *existing infrastructure*.

Concerning *new infrastructure*, expansion of the French *motorway network* has continued, with extensive use of *public-private partnerships* and tolls for intercity travel. The passenger rail network has also been increased. The TGV *high-speed* network has continued to grow through both construction of new lines and refurbishment of old ones to allow higher speeds. The new TGV lines form part of a European network, interconnected via Paris's main airport (Box 2.3). The TGV is often regarded as a low-cost rival to airlines on certain routes inside France and to neighbouring countries. The increase in leisure time resulting from the 35-hour workweek has led to a corresponding increase in leisure travel.

Regarding *goods transport*, much remains to be done. Measures set out in the SSCs have been adopted. One objective is to double rail freight and encourage combined transport, which would slow growth in emissions attributable to long-distance transport. Roads still account for a substantial share of regional investment, at 64% over 2000-06, but the share is 20% lower than that for 1994-99. Resources

devoted to rail are set to increase by 23% from 2000 to 2006, compared with 4% from 1994 to 1999. In February 1999, the minister in charge of transport announced that EUR 18 billion would be invested in the rail system over 2000-10. The development of rail is especially urgent in the ecologically sensitive Alps and Pyrénées, where road traffic is high and rising (2.6 million heavy trucks per year in the Alps, 4.6 million in the Pyrénées). Two "motorway of the sea" shipping projects should help stem the rise.

A *Transport Infrastructure Financing Agency* was established in November 2004 to help fund projects of national or international importance relating to the construction or development of road, rail, waterway and port infrastructure and the creation or development of seaborne freight transport links.

3

WATER MANAGEMENT*

Features

- Water pollution from agriculture
- Flood prevention
- Internalising externalities with pricing and charges
- Role of Water Agencies

* This chapter reviews progress over the last ten years, and particularly since the previous OECD Environmental Performance Review of 1997. It also reviews progress with respect to the objective "maintaining the integrity of ecosystems" of the 2001 OECD Environmental Strategy.

Recommendations

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

- reduce *pollution of agricultural origin* (from both crop and livestock farming) by continuing to reform farm subsidies (to decrease incentives for pollution-prone intensive farming), by implementing cross-compliance in agricultural support and by introducing efficient, targeted measures to reduce excessive nitrogen use at individual farm level;
- improve the balance between Water Agencies' outlays on and income from *agriculture*;
- continue to develop *flood risk prevention plans* and establish a monitoring mechanism to ensure that they are effectively put into practice;
- consolidate *water policing* powers in each département and assure stricter control of compliance with water-related provisions of the Environment Code;
- take a more holistic approach to *basin-based management* by extending the Water Agencies' role, in particular as regards wetland protection;
- review the *Water Agencies' procedures for financial allocations* so as to make them more economically and environmentally effective; make economic analysis of projects systematic.

Conclusions

The role of the river basin authorities, which were established in 1964 and buttressed by the 1992 Water Law, has expanded from purely financial tasks (collecting abstraction and pollution charges and distributing the revenue for investment) to assessment of the state of aquatic environments and to planning. The integrated management at major basin level, which is partnership-based and multi-annual, has proved highly effective, especially in dealing with industrial and municipal pollution problems by applying the polluter pays and user pays principles. *Industrial pollution* of watercourses has continued to decrease. Meters have been installed to improve *management of water resources*, especially for irrigation. A drought plan was introduced following the 2003 heatwave. Flood prevention plans were introduced in 2003 and are binding on third parties. Operating and investment costs are *financed* by cost-recovery charges and Water Agency charges, respectively. This approach should give France favourable conditions for meeting its forthcoming obligations under the EU Water Framework Directive. *Taxes* have been introduced on pesticides, on phosphate detergents and on aggregates extraction; the scope of a more

recent levy on nitrates should be extended. With floods and flood damage becoming more frequent, much has been done in terms of legislation, regulation and planning to prevent floods and their consequences.

Over the last ten years or so, however, weaknesses in water policy have become apparent, relating to such *emerging issues* as chronic pollution by newer products such as endocrine disrupters and antibiotics, whose effects are still poorly understood. *Agricultural pollution* of watercourses with nitrates and pesticides continues despite the measures taken. Insufficient attention is paid to ecosystems such as riverbanks. *Drinking water quality* continues to be a concern in places, notably where supply sources are insufficiently protected. *Enforcement efforts*, despite progress, are dispersed among various services, reducing effectiveness. The Water Agencies do not base their *financing decisions* on economic analysis of proposed projects, and cross-subsidisation from households to farmers often occurs. The level of *waste water treatment* has not improved sufficiently, and France is under threat by the European Commission of having to pay a penalty for its shortcomings on this point.

♦ ♦ ♦

1. Water Management Objectives

France's chief *medium-term water management objectives* are to:

– combat nitrate pollution from farming and protect drinking water resources;

– strengthen the multi-year flood prevention programme;

– strive to prevent accidental pollution of coastal waters;

– apply integrated water management instruments (especially the SDAGE and SAGE water management plans);

– invest in waste water treatment to ensure that sewage treatment plants meet the 1998 requirement of the EU Urban Waste Water Directive;

– implement the EU Water Framework Directive;

– pave the way for reform of water policy focusing on providing good drinking water for all, better protecting aquatic environments, controlling the impact of human activities, improving institutions and financing mechanisms, organising government action more effectively, simplifying and increasing the basin-level charges levied by Water Agencies, and increasing openness in public water and waste water service provision.

France's performance can also be evaluated in the light of the seven *recommendations of the 1997 OECD Environmental Performance Review*:

– step up monitoring of drinking water and of the quality of watercourses and aquifers;

– take measures to curb excessive withdrawals for irrigation and to reduce agricultural pollution of surface and groundwater (from intensive cultivation and livestock raising); strengthen economic signals within the agriculture sector (charges and prices) and the integration of policies relating to water into agricultural policies and practices;

– strengthen the assessment criteria relating to the impact of projects on aquatic ecosystems;

– strengthen controls on land use in areas subject to flooding;

– increase the dissuasive strength of regulatory requirements by making greater use of the enforcement powers of the state's decentralised services; consider simplifying and reorganising decision-making powers with regard to implementation of regulations; ensure that decision making is entrusted to the decentralised authorities of the state;

– continue efforts to improve the performance of sewerage and waste water treatment facilities; maintain efforts to ensure that local authorities build the facilities necessary to meet objectives;

– further apply the strategy of internalising costs through charges and prices to finance water policy, as is already done with industry and local authorities.

2. Quality Management

2.1 Monitoring

In accordance with the first OECD recommendation above, progress has been made in *monitoring water quality* of aquatic environments. Monitoring has been extended to new pollutants such as VOCs, heavy metals and, most notably, pesticides. New tools for evaluating the state of aquatic environments include a fish index and the Water Quality Evaluation System (SEQ-eau). Water supply quality is monitored through the Water Health and Environment Information System (SISE-eaux). A five-year management plan for diadromous fish has been drawn up for each basin that drains to the sea, along with a set of indicators tracking the spread of migratory species back into those environments.

Better co-ordination among the many players involved is needed, however. In response to the EU Water Framework Directive, the Ministry of Ecology and Sustainable Development (MEDD) and associated agencies (the Water Agencies, the Higher Council on Fisheries or CSP, and IFEN, the French Environment Institute), along with the French geological survey or BRGM, the French Research Institute for Exploitation of the Sea, the International Office for Water and Électricité de France, have begun working together to produce a national water information system and publish the results on the Internet (Chapter 6). Concerning *pesticides*, in late 2003 the ministries dealing with health, agriculture, consumer affairs and the environment asked the French Environmental Health Safety Agency, the French Food Safety Agency and IFEN to establish a research centre on pesticide residues. Its tasks are to gather information about pesticide residues in various environments and in products for human consumption, to estimate exposure levels and to identify ways to improve information systems.

2.2 Drinking water

The *quality of the water supply* in France has generally improved in recent years with the introduction of more sophisticated water treatment and better selection of drinking water sources. Water suppliers serving more than 5 000 inhabitants (i.e. 75% of the population) have continued to improve their compliance with standards. The most recent figures (in percentage of the number of service providers) show over 98.6% compliance for microbes, 97.5% for nitrates and 95.7% for atrazine, the herbicide most prevalent in water in France.

Nevertheless, *protection of drinking water resources* is not completely assured. In 2003, 8-9% of the population received water whose *pesticide* content exceeded the standard at least once. In Brittany, 1% of the population receives water that always exceeds the *nitrate* standard (with concentrations in excess of 50 mg per litre) and 6% of the population faces such conditions part of the time. The situation is aggravated by the fact that many water withdrawal points in Brittany have been abandoned in the last ten years because of excessive nitrate levels. Nationwide, protection perimeters are required for the 36 000 public water supply sources throughout much of the country, but these offer only local protection against point-source pollution. A tool is needed to combat diffuse pollution from agriculture on watershed scale. The draft water bill of September 2004 contained a proposal to this effect, and a new text was scheduled for parliamentary debate in 2005. Moreover, the procedure for establishing protection perimeters needs to be simplified: in 2003 only 37% of all water withdrawal points had perimeters. The National Health and Environment Plan of June 2004 requires 80% of supply points to be protected by 2008 and all by 2010.

Box 3.1 Financial stakes in water supply and waste water treatment investment

IFEN reported that pollution abatement and control expenditure related to waste water treatment totalled EUR 11.2 billion in 2002 and that the sum for drinking water treatment and supply was EUR 7.3 billion. Investment expenditure accounted for about one-third of the combined total and operating expenditure for two-thirds. The situation in 2002 continued trends observed since 1999 with a moderate increase in current spending and a *sharp rise in capital spending*.

As regards investment, *three major issues* can be identified for the present and near future: improving the quality of water supply, continuing the effort to improve waste water treatment and renovating facilities and networks.

Work on the system is needed if *water supply quality* is to comply with the strict drinking water standards of the 1998 EU directive. To meet the lead concentration limit of 10 µg per litre necessitates work by water companies that will cost around EUR 4.5 billion (of which EUR 1 billion has already been spent), while replacing mains in the private part of the system will cost about EUR 7.6 billion. The total cost of compliance is estimated at EUR 11.3 billion over the period to 2013.

More also needs to be done to ensure that *sewerage* in settlements of more than 2 000 population-equivalent complies with the Urban Waste Water Directive. The work remaining, estimated at EUR 9.2 billion, is well behind schedule for the 2005 deadline.

Given that the existing physical assets of water and waste water companies are worth an estimated EUR 200 billion, *renewal of existing facilities and networks* is also a major issue. EUR 1.5 billion a year is needed for work on existing water supply infrastructure and EUR 0.8-1.5 billion a year for waste water treatment systems.

The objective is to halve the number of people whose water does not meet standards. In addition, the entry into force in late 2003 of standards laid down in the 1998 EU drinking water directive necessitates a major programme between 2004 and 2013 to reduce natural corrosiveness in water and replace *lead* pipes. The total cost of that measure alone is likely to be some EUR 11 billion (Box 3.1).

2.3 Quality of aquatic environments

Overall, *water quality in aquatic environments* has deteriorated. Since 1998, annual surveys have shown that *pesticide contamination of water* is still widespread (Table 3.1). An IFEN report on the 2002 results showed 80% of surface water samples and 57% of groundwater samples contained pesticides; for drinking water sources, 40% of surface water sources and 21% of groundwater had levels requiring decontamination.

Table 3.1 **Pesticides in water**

(%)

Water resources[a]					Water used for drinking water supply				
Quality class[b]	Watercourses		Groundwater		Surface water		Groundwater		Quality class[c]
	1998	2002	1998	2002[d]	1998	2002	1998	2002	
Very good or good	57	54	38	75	59	60	76	79	Very good or good: can be distributed without treatment
Average or poor	34	38	64	24	39	39	24	21	Poor: needs treatment
Very poor	9	8	. .	1	2	1	. .	. .	Very poor: can be distributed only with authorisation
Total	100	100	100	100	100	100	100	100	Total
Monitoring points	305	624	492[e]	1 078	726	838	2 183	2 603	Monitoring points
Substances tested	319	408	259	373	319	408	259	373	Substances tested

a) Categorised in quality classes by monitoring at points separate from those where water intended for drinking water supply is withdrawn.
b) SEQ-eau classification; assessment criteria take the needs of aquatic life and requirements for different water uses into account.
c) SISE-eaux classification: very good or good quality = < 0.1 µg/l for individual substances and < 0.5 µg/l for total substances; very poor quality = ≥ 2 µg/l for individual substances and ≥ 5 µg/l for total substances.
d) The quality classification for drinking water supply was used in 2002.
e) Only the Rhin-Meuse, Artois-Picardie, Seine-Normandie and Rhône-Méditerranée-Corse basins are represented.
Source: IFEN.

Table 3.2 **Nitrates in watercourses,** by basin

(%)[a]

	Bretagne	Seine	Manche	Gascogne	Loire	Nord	Garonne	Méditerranée	Rhône
1990-95	80	40	30	30	20	15	5	5	1
1996-2000	90	60	50	35	30	15	5	5	2

a) % of monitoring stations in each basin registering over 20 mg NO_3/l on average over the period.
Source: IFEN.

In 84% of cases where water service had to be restricted, atrazine and its degradates were the cause. Restrictions were imposed on 193 service providers supplying 400 000 people. Herbicides are the products most often found; they are also the type of pesticide most widely used in France. Reacting to the IFEN report, MEDD and the ministry in charge of agriculture began drawing up an interministerial programme to reduce the use of pesticides, and the new water bill will include measures aimed at improving pesticide use. These ministries had already launched two joint programmes to reduce pollution by pesticides in 2000 and 2002, but the continued presence of triazine herbicides in surface water, groundwater and coastal waters led the ministry in charge of agriculture to ban most of them from 2003.

In Brittany, one water sampling point in three exceeds quality standards for *nitrates* at least once a year. Nationwide, the trend is worsening (Table 3.2). A monitoring programme for nitrates in water is carried out every four years under the EU nitrates directive, which was transposed into French law in 1993. As the 1999-2000 monitoring showed no improvement, nitrate-vulnerable zones were redefined and extended, including over the entire Île-de-France region. After the European Court of Justice ruled in 2002 that France had still not properly implemented the directive, the zones were again extended, mainly in the départements on the Channel and North Sea coasts. The first phase of the common procedure to determine the state of *eutrophication of the OSPAR maritime area* (sorting procedure), completed in 2004, showed that only nine of the 35 sites examined on the North Sea/Channel/Atlantic seaboard could be classed as having no eutrophication problem.

However, progress has been made on the *biological quality of watercourses*. For example, 1 228 salmon were counted on the Vichy fish ladder in the Loire basin in 2003, the highest number since the station was established. In the Paris metropolitan area, 20 species have been reintroduced into the Seine, including pike-perch, perch, pike, gudgeon and eel. A fish index has been developed, reflecting the diversity, density and ecological characteristics of the various species in observed populations. Nationwide, in 1999, 62% of monitoring stations were classed as very good or good quality and only 7% as very poor. This reflects a satisfactory variety of habitats on little-developed major rivers and good water quality in small mountain streams.

3. Management of the Resource

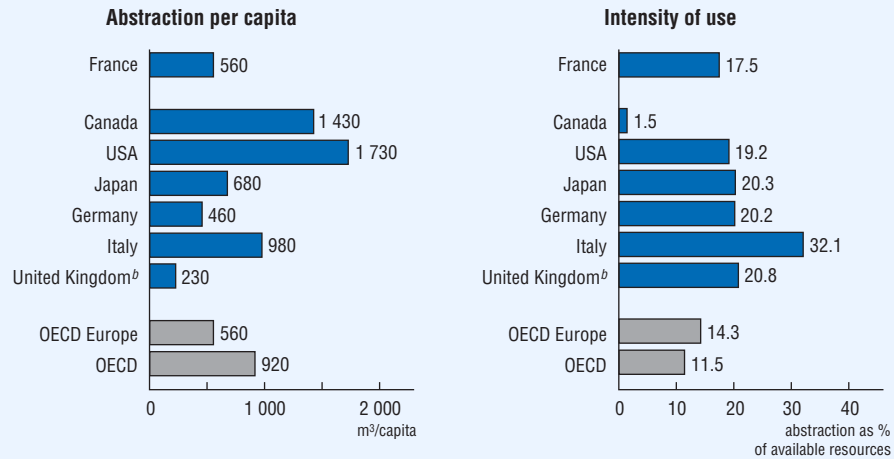
3.1 Withdrawals and intensity of use

In accordance with the second OECD recommendation listed above, measures have been taken to limit withdrawals for irrigation. *Information about water withdrawals*, formerly very incomplete in the farming sector, has improved considerably

since 2000 when environmental conditions on financial support for irrigation farming were introduced as part of the Common Agricultural Policy reform. Irrigators without a water meter and withdrawal licence no longer receive support. Hence, many irrigators have installed meters and more information is available about amounts of water withdrawn for various types of activity; the amounts have stabilised in all user categories. Other *measures to limit agricultural withdrawals* are based on tools such as water development and management plans (SAGE), territorial farming contracts and collective infrastructure management (Box 3.2).

Nevertheless, *intensity of freshwater use* remains higher than the OECD average (Figure 3.1). Many water resources *continue to be characterised by supply-demand imbalance* because of excessive withdrawals. A 2003 decree identifies these resources and tightens regulations on freshwater withdrawals. A national debate on water policy in 2003 showed that other measures were needed, notably a revaluation of water charges aimed at increasing incentives for conservation and the promotion of collective management of withdrawals in affected areas. The water bill contains proposals on these measures.

Figure 3.1 **Freshwater use,** early 2000s[a]



a) Or latest available year.
b) England and Wales only.
Source: OECD, Environment Directorate.

Box 3.2 **Institutional framework for water management**

Several players carry out water management in France. Municipalities are responsible for *water distribution and waste water treatment*. The 1992 water law also gave them responsibility for water pollution abatement and control, as well as stream maintenance and restoration. Local authorities often subcontract water and waste water service provision and system maintenance to public or private enterprises. The municipality or subcontractor sets water prices. With the 1964 Water Law, France became the first OECD country to adopt devolved, *integrated, basin-based water management*; the EU Water Framework Directive was inspired by the French approach. A River Basin Committee, comprising representatives of central and local government and water user groups (industry, farmers, consumers, non-governmental organisations [NGOs]), defines objectives for each basin, consistent with national water policy and EU directives and applied via regulatory and economic instruments. *Regulatory action* relies on decentralised state agencies, such as Regional Directorates of Industry, Research and the Environment for industrial discharges and the départements' Agriculture and Forestry Directorates (DDAF) for agricultural withdrawals and pollution. *Economic incentives*, in the form of waste treatment premiums financed directly from withdrawal and pollution charges, are the responsibility of the six Water Agencies, which thus play a central role.

Water-related planning is organised around the *six major river basins*. Each has a basin committee and a financial agency (Water Agency), which is the executive body for basin-based water management. The main planning tools are the *water development and management master plan* (SDAGE) at basin level and a *SAGE* for each sub-basin. Both are valid for ten to 15 years (to be reduced to six to nine years for the SDAGE plans when they are reviewed in 2009). The basin committee draws up the master plan and monitors its implementation. The SDAGE has to define: i) basic guidelines for balanced management of the resource; ii) water quality and quantity objectives; iii) the means of covering water use costs, distinguishing between industry, agriculture and households; iv) arrangements to protect and improve the state of water and aquatic environments; and v) the sub-basins for which SAGE plans need to be prepared, together with deadlines for drawing them up and revising them. Urban planning tools (territorial cohesion plan, local zoning plan, municipal maps) must be compatible with the SDAGE guidelines and objectives, or rendered compatible within three years. Pursuant to the 1992 Water Law the first generation of SDAGE plans was adopted in late 1996. Each SAGE is prepared by a local water commission (which holds discussions and takes decisions but has no legal standing) and implemented by a local water community made up of local authorities, which has legal standing and can collect money to act on and implement the SAGE. There were 19 SAGE plans in operation in mid-2004, 64 in preparation, 15 at the consultation stage and 25 at the planning stage.

Box 3.2 **Institutional framework for water management** *(cont.)*

Alongside these planning tools are *river contracts*. Resulting from local initiatives and generally lasting five years, they bring together stakeholders including elected officials, users, residents and NGOs, who undertake a management project for the resource and associated ecosystems. Actions in the framework of these contracts can include pollution abatement and control measures, flood prevention, river bank maintenance, tourism value enhancement and wetland preservation. After being appraised by the Regional Environment Directorate the contract is validated by the basin committee, and the prefect then appoints a river committee to carry out related planning and implementation. The main partners providing funds are MEDD and the Water Agencies. A river contract may serve as a means of realising SAGE objectives, or, with the consultation it involves, it may pave the way for a SAGE. But unlike a SAGE, which has the force of regulation, a river contract is only a contractual commitment to carry out an action programme.

The transposition into French law of the Water Framework Directive entailed extending the powers of the basin committees. Each is now responsible, within its basin, for establishing and regularly updating an *inventory* that includes: i) an analysis of the basin's characteristics and the effects of activities on the state of the water; ii) an economic analysis of water use; and iii) one or more registers of protected zones (under EU legislation on protection of surface water, groundwater and conservation of habitats and species) and current or future drinking water withdrawal points. These documents were due for completion by the end of 2004.

The heat wave in the summer of 2003 highlighted the need for better climate crisis management. Consequently, a *drought action plan* was introduced in March 2004. It provides for national and basin monitoring committees to better anticipate needs and co-ordinate special measures to restrict water withdrawals and track watercourse temperatures, as extremes can cause substantial damage to aquatic environments. Given the state of water resources (groundwater, dams, watercourses and snow cover) at the end of March 2004, the national committee was activated for the summer of 2004. Chaired by the CSP, it includes experts, representatives of user groups (households, farmers, manufacturers, power producers, local authorities, and nature conservation and fishing associations) and representatives of the government agencies concerned.

3.2 Aquatic ecosystems

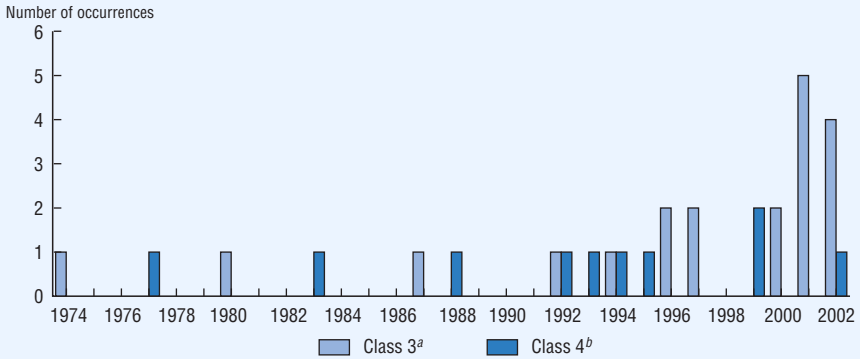
As regards the *preservation of aquatic ecosystems*, environmental impact assessments (which have existed since 1976) are sometimes too local to take account of the entire ecosystem concerned and often have little effect on a project. New management instruments have therefore been developed: SDAGE plans (at basin level), SAGE plans (Box 3.2), environmental contracts for rivers, lakes and aquifers, and wetland action plans. A national wetland action plan, introduced in 1996, will be reinforced by rural development legislation now before the Parliament. Watercourse restoration programmes have been revised to incorporate more environment-friendly methods such as vegetation techniques for restoring river banks. In accordance with the third OECD recommendation listed above, action has been taken to better evaluate the impact of projects on aquatic ecosystems: cost-benefit analysis techniques have been introduced at basin level. Some 40 studies (including 15 carried out by MEDD or the Water Agencies) have improved understanding of harmful and beneficial effects where water is concerned. MEDD contributes to EVRI, an international database of results from empirical studies on economic valuation of environmental benefits and human health effects.

3.3 Floods

France has experienced flooding and severe flood damage since the early 1990s. *Floods seem to be increasingly frequent and serious* (Figure 3.2). The phenomenon appears to be linked to several factors, whose influence varies by region; they include climate change (one effect of which is to make heavy winter rains more frequent in western France), a reduction in grassland area, the spread of surface sealing in some places, and, above all, increased construction in flood plains.

To strengthen land use planning for flood-prone areas in 11 000 municipalities, elaboration of *flood risk prevention plans* was recently speeded up: some 4 000 plans were completed in 2003 (in line with the fourth OECD recommendation listed above). The 1995 Law on Enhanced Environmental Protection made such plans compulsory; their purpose is to map high-risk areas, prohibit human settlement in the most dangerous ones, reduce vulnerability of existing installations and preserve areas' run-off and overflow capacity. The prefect (and, under his authority, the département infrastructure directorate) is responsible for drawing up the plan, preferably for an entire watershed. The draft plan goes for comment to the municipalities concerned and a public enquiry is held, following which the plan may be amended before being approved and put into effect. An atlas of all municipalities in flood-prone areas is to be ready in 2005.

Figure 3.2 **Class 3 and 4 floods**



a) 10 to 99 fatalities or EUR 30-300 million in material damage.
b) 100 to 999 fatalities or EUR 300-3 000 million in material damage.
Source: MEDD.

The Law on the Prevention of Technological and Natural Risks and Repair of Damage, approved in July 2003, strengthened the 1995 law. For floods, it aims to *combine nature preservation with risk prevention.* Upstream it enables local authorities to institute flood easements to facilitate construction of flow regulation projects that will maintain temporary floodwater retention zones; it also provides for compensation for the easements. The law aids restoration of stream beds' natural conditions by regulating development upstream in a watercourse's "mobility zones". It applies to 34 watersheds covering 25% of the country. It states that to facilitate flood prevention and the balanced use of water resources at watershed or subwatershed level, the local authorities (e.g. département councils) may form a basin public corporation.

Also in 2003 a new *flood warning system* was set up. It includes replacing the existing flood warning services with flood forecasting services using a holistic, watershed approach, and setting up a central hydrometeorological and flood forecasting support service. MEDD has financed increased radar coverage: five meteorological radar units to aid flood prediction were added between 1994 and 2002, with five more due between 2003 and 2006.

More generally, the 1995 law replaced natural risk exposure plans with a *natural risk prevention plan* covering floods, landslides, avalanches, forest fires, earthquakes, volcanic eruptions, storms and whirlwinds. To combat soil erosion, the 2003 law encourages "best practice" in farming (e.g. retaining vegetation cover and hedges, ploughing perpendicular to the slope), whether by persuasion or, in erosion-prone areas, by compulsion. It also seeks to improve information provision by means such as mentioning natural risks in property transactions in risk-prone areas, placing flood level indicators on public structures and regularly providing information to the populations most at risk.

4. Enforcement of Regulations

In line with the fifth OECD recommendation listed above, to increase the dissuasive force of regulatory requirements, *policing of water-related activities* has improved. First, *staffing* has risen: the number of DDAF officials assigned to water policing rose from 300 to 430 between 1997 and 2002, while that at the CSP rose from 780 in 1998 to 842 in 2004, including 660 field officers. Second, between 1999 and 2003 the government reorganised interministerial work on water policing in its *decentralised agencies* for each département: *one official* reporting to the prefect, with a position and task defined at national level in a 2003 circular, steers an Inter-Agency Water Mission (MISE); a "*one-stop*" *service* facilitates compliance with formalities; and a MISE *strategy committee* defines issues and priorities in the enforcement of water regulations. A guide to water policing control plans has been

Table 3.3 **Water policing: administrative and judicial sanctions**

	Administrative proceedings			Judicial proceedings					
				Reports sent to public prosecutors			Prosecutions		
	2000	2001	2002	2000	2001	2002	2000	2001	2002
Water	573	322	1 046	342	387	546	27	22	15
Fishing	2 246	841	801	3 882	4 666	4 186	438	397	290
Total	2 819	1 163	1 847	4 224	5 053	4 732	465	419	305

Source: MEDD.

drawn up and sent to each MISE. Despite these advances, however, *fragmentation of water policing among many agencies* undermines effectiveness. A reform being considered would consolidate responsibility for water-related policing in a single agency for each département.

Violations of the Environment Code related to water and freshwater fishing have increased in recent years, while the number of cases prosecuted has steadily fallen (Table 3.3), a fact that may reflect a certain relaxation of enforcement. The maximum criminal penalty is two years' imprisonment and a EUR 150 000 fine. Prefects assign the officers who enforce water legislation, and the minister of ecology and sustainable development commissions those who enforce fishing legislation. Prosecution is far more common for fishing offences than for pollution or damage to watercourses.

5. Basin-based Management and Application of the User Pays and Polluter Pays Principles

5.1 Diversifying the Water Agencies' role

When they were established in 1964, the six water basin financial agencies seemed to serve more as "*mutual banks*" *for local water managers and users* than as instruments of policy implementation. Though they are public corporations receiving no budget appropriations, the agencies have substantial resources because they collect water withdrawal and pollution charges, mainly related to industry and households. Their combined annual budget comes to EUR 1.5 billion (equivalent to 0.1% of GDP, or 15 times the budget of the MEDD water department). The six agencies thus account for a substantial proportion of the financial resources related to water policy.

Since 1992 and the framing of a national water policy, the agencies have diversified their role, which now includes co-ordinating the networks that monitor the state of water resources and helping the River Basin Committees draw up the SDAGE management plans introduced in 1996 (Box 3.2). The process may seem incomplete, for although the agencies' activity (notably excepting some transfers to irrigation) appears broadly consistent with the general guidelines of the SDAGE, as called for in the 1992 Water Law, *no authority guaranteeing proper implementation of the SDAGE plans yet exists*. Moreover, the agencies still play a financial role and do not commission environment-related projects.

The Water Agency system is well-suited to deal with point-source pollution generated by a certain number of polluters like factories and towns, but it must evolve to tackle the problem of diffuse pollution and, beyond that, *aim to achieve an overall environmental outcome*. Any reform that might be carried out will naturally have to

preserve the principles of the 1964 law on which the system's success has been based, especially *devolution*, *basin-wide* management, the direct involvement of *users and elected officials*, and a *multi-year framework*.

5.2 Increasing the Agencies' effectiveness

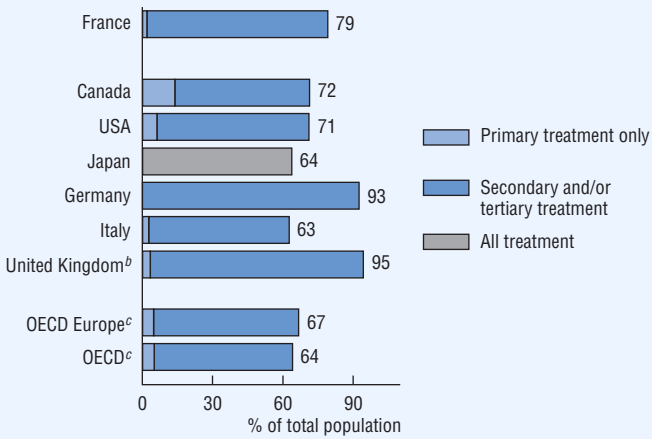
The rationale behind the Water Agencies' financial workings tends to result in a *lack of balance between the resources devoted to conventional chemical pollution and those devoted to other problems*, especially floods and pesticide run-off. The funding devoted to the various aspects of water policy thus needs to be readjusted to reflect the issues at stake, and to be based on cost-benefit analysis of proposed projects.

In their seventh and eighth action programmes (1997-2002 and 2003-06), the agencies reduced the funding for ecosystem management measures such as stream and aquifer improvement and restoration of aquatic ecosystems. The investment figures in the eighth programme show that *waste water collection and treatment and, increasingly, reduction of agricultural pollution continue to be priorities* (Table 3.4). Considerable progress is still needed in these areas to comply with EU directives, especially as regards municipal waste water treatment and nitrates of agricultural origin.

The water agencies provide investment support for current and future water and sewage treatment facilities: the sum was EUR 12 billion in the seventh programme. After the related recommendation was made in the 1997 OECD review, compliance with the *EU Urban Waste Water Directive* for sewage treatment plants in settlements of over 10 000 population-equivalent discharging into sensitive areas rose from 41% at the end of 1998 to 71% at the end of 2002; however, compliance should have been 100% on 31 December 1998, the first deadline of the directive. For urban areas of over 15 000 population-equivalent discharging outside sensitive areas the compliance rate was 89% at the end of 2002. On 23 September 2004, the European Court of Justice condemned France for failure to respect the directive. Thus, implementation is lagging *despite considerable financial efforts made since the early 1990s*. Still, three-quarters of France's population is connected to a sewage treatment plant, which is above the OECD and OECD Europe averages (Figure 3.3). There is a plan to introduce performance tracking indicators for public water and waste water treatment services.

Water Agency charges represent some 16% of water bills (Table 3.5). The idea that "*water should pay for water*" is well-accepted in French society, as long as it pays only for water, via efficient financial mechanisms and with transparency for users assured. Water prices (excluding taxes and pollution charges) increased by around 8% on average nationwide between 1998 and 2001, i.e. twice as much as the

Figure 3.3 **Population connected to public waste water treatment plant,** early 2000s[a]



a) Or latest available year.
b) England and Wales only.
c) Secretariat estimates.
Source: OECD, Environment Directorate.

Table 3.4 **Investment projects with Water Agencies funding**[a]

(EUR million)

	1992-96 (6th action programme)	1997-2002 (7th action programme)	2003-06 (8th action programme)	Change between 7th and 8th programmes (%)
Municipal waste water treatment[b]	1 579	1 926	1 473	*–24*
Industrial pollution	391	418	312	*–25*
Agricultural pollution	54	246	467	*+89*
Drinking water supply	360	431	340	*–21*
Improvement to water resources[c]	185	165	91	*–45*
Restoration of aquatic environments	116	147	128	*–13*
Total	2 685	3 333	2 811	*–16*
of which: Agencies transfers (%)	1 383 (51%)	1 817 (54%)	1 319 (47%)	*–27*

a) Annual averages.
b) Treatment stations and sewerage.
c) Both surface water and groundwater.
Source: Budget Law.

Table 3.5 **Breakdown of a water bill,**[a] 2000

	EUR/m^3	(%)	Change 1995-2000 (%)
Water distribution	1.16	*44*	*11*
of which:			
Fixed charge[b]	(0.22)	*(8)*	*30*
Volumetric charge[b]	(0.90)	*(34)*	*7*
Withdrawal charge[c]	(0.04)	*(2)*	*15*
Waste water collection and treatment[b, d]	0.83	*31*	*17*
Public bodies	0.66	*25*	*24*
of which:			
Pollution charge[c]	(0.41)	*(16)*	*28*
Other[e]	(0.25)	*(9)*	*18*
Total	2.65	*100*	*16*

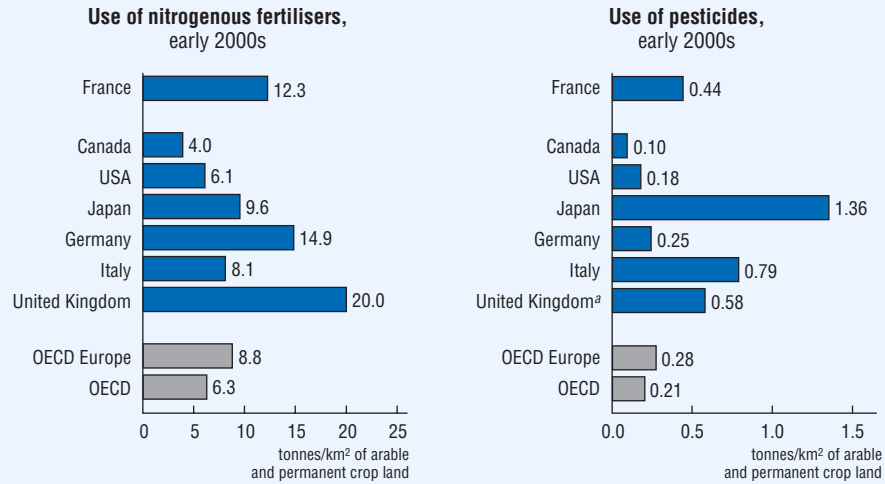
a) Average values for a household consuming 120 m^3 per year.
b) Including subcontractor's share when the service is delegated.
c) Paid to Water Agency.
d) Fixed charge and volumetric charge.
e) National Drinking Water Supply Fund (special Treasury account, funded 55% from water bills and 45% from a levy on pari-mutuel betting revenue, available only to rural municipalities), French Waterways (public corporation created in 1991 to develop 6 800 km of waterways) and VAT.
Source: General Directorate of Competition Affairs and Fraud Prevention.

consumer price index. Waste water treatment charges increased by 10% and water supply charges by 5%. The rise in waste water treatment prices has slowed significantly, however, from an average of 11.2% nationally over 1990-98 to 2.6% over 1998-2001. The average total bill (supply and waste water treatment) in municipalities with collective waste water treatment facilities (i.e. 82% of the population) was EUR 2.80 per cubic metre in 2001.

5.3 Agriculture, consumer

Responding to the second and seventh OECD recommendations listed above, incentives such as investment aid, pollution charges and tax measures are being used to try to reduce *pollution of watercourses from crop and livestock farming*. The effect of these measures has been very limited to date. Nitrogen fertiliser and pesticide use per square kilometre continues to be significantly higher than the OECD and OECD Europe averages (Figure 3.4). The average national surface nitrogen balance is more than 21 kg per hectare. Consideration is being given to ways of improving the

Figure 3.4 **Agricultural inputs**



a) Great Britain.
Source: FAO; OECD.

financing of water policy, including the possibility of *extending internalisation to agriculture through charges and pricing*. Some progress has been made, for example through the introduction of a pesticide tax in the framework of the general tax on polluting activities (TGAP), but with marginal effect. An overhaul of water policy financing, announced in 1998, has been put on hold, but discussions are continuing on a realignment of the respective shares of households, farms and industry in the redistributive effect of Water Agency financial aid and charges. Current work to implement the Water Framework Directive should enable better evaluation of the extent to which the costs of services related to water use are recovered.

In response to the requirements of the EU nitrates directive, the Programme to Control Pollution of Agricultural Origin (PMPOA) has provided *investment aid* to 50 000 farmers for manure and slurry storage. Over 1994-2001, EUR 1.5 billion was invested, with one-third financed by the Water Agencies, one-third by central and local government and one-third by the farmers. In 2002, the Programme to Control Pollution from Livestock Farm Effluent replaced PMPOA, the scope being extended to smaller farms. The programme is expected to cover 105 000 farms and cost

EUR 1.3 billion over 2002-06. The pollution charge hitherto levied on estimated or measured waste water discharges from households and industry was extended to very large farms in 1996 as part of PMPOA. This "*livestock charge*" goes into the Water Agencies' budget. The sound idea of *extending the pollution charge to excess nitrates* from intensive crop farming, proposed in 1998 and championed by successive ministers, was later dropped. Opposed by the farm lobby, the idea resulted in repeated redrafting of the water bill. A proposal to introduce a "nitrogen tax", supported by fertiliser manufacturers, was also dropped. The TGAP was extended to pesticides in 2000 at rates tied to products' human and environmental toxicity. The September 2004 draft of the water bill contains a proposal to convert the *pesticide TGAP*, whose revenue accrues to the central budget (pesticide producers currently pay some EUR 40 million a year), into a charge collected by the Water Agencies, with a premium to reward farmers whose pesticide use is low or nil.

Until the early 1990s the Water Agencies' multi-year action programmes were prepared and approved in such a way that what each user group paid in was roughly balanced by the aid it received. That has changed in recent years, however, because of the agencies' commitment to reducing agricultural pollution combined with the lack of corresponding charges. The sixth, seventh and eighth programmes (1992-96, 1997-2002 and 2003-06) involved a *significant transfer from industry and households to agriculture*. Farmers pay the agencies some EUR 17 million a year (EUR 12 million for irrigation water withdrawals and EUR 5 million for nitrogen charges on large farms) and receive EUR 150 million a year for pollution control. Over 1997-2002, local authorities accounted for 84% of pollution and withdrawal charges paid to the agencies, industry accounted for 15% and agriculture for 1%. Over the same period, local authorities received 77% of the agencies' investment aid, industry 13% and agriculture 10%.

The magnitude of this *imbalance* shows that water users do not enjoy equal treatment. A 2002 version of the water bill sought to restore the balance through a tax on excess nitrogen and a gradual reduction in the benefits to farmers via the irrigation charge. The June 2004 draft bill called for a dual charge on diffuse pollution by maintaining the tax on pesticides at EUR 40 million a year and introducing a nitrogen charge to be paid not just by large farms but also by those farming intensively. In this version of the bill, farmers' annual payment to the Water Agencies would increase from EUR 17 million to EUR 70-80 million.

Charges for excessive nitrogen spreading such as exist in some OECD countries would also be likely to encourage farmers (especially those in nitrate-vulnerable areas) to use nitrogen, including organic fertiliser, more efficiently. Such an instrument must be based on nitrogen balances at farm level, which could be included in

the sustainable farming contracts that replaced territorial farming contracts in 2003 as a means of implementing agri-environmental measures. The cost-effectiveness of such an approach depends to a considerable extent on *transaction costs* (for implementation, control and monitoring).

4

NATURE AND BIODIVERSITY MANAGEMENT*

Features

- Natura 2000 network
- Richness of biological heritage overseas
- Protection of coastal areas
- Landscape protection
- International commitments
- Financing

* This chapter reviews progress over the last ten years, and particularly since the previous OECD Environmental Performance Review of 1997. It also reviews progress with respect to the objective "maintaining the integrity of ecosystems" of the 2001 OECD Environmental Strategy.

Recommendations

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

- integrate *biodiversity concerns into sectoral policies* (dealing with farming, forestry, tourism and land use planning) in accordance with the national biodiversity strategy, and periodically evaluate progress on action plans;
- increase the integration of biodiversity concerns into *local decisions* relating to economic development, land use planning, infrastructure and tourism activities;
- continue to expand *protected areas*, especially through extension of: i) the network of protected areas under Natura 2000 to 15% of Metropolitan France, ii) marine areas and iii) protected areas in overseas départements;
- seek out and improve partnerships to build consensus regarding the issues at stake in connection with the EU *directives on habitats and birds* and the *Bern Convention*;
- enforce the *coastal law* more strictly and speed up the *Coastal Conservatory's* land acquisitions by significantly increasing its budget to achieve the targets for the metropolitan coastline (200 000 hectares in 30 years); give the Conservatory an objective and resources that match the scale of the coastline challenges in overseas départements; continue to draw up and implement *marine enhancement plans* for the main coastal regions, in particular by introducing monitoring mechanisms;
- take *landscape* protection into account in sectoral policies and sectoral decisions at national and local level, and increase government assistance for the management of major sites;
- organise and increase the *resources for studies* on biodiversity (e.g. at the Natural History Museum, at the French Institute for the Environment, and in the overseas départements); increase *funding for nature conservation*, including by adjusting local taxation and finance.

Conclusions

France has exceptionally rich biological resources and therefore great *responsibility* both within Europe and, through its presence in three oceans, worldwide. It has *recognised knowledge* in most aspects of biodiversity, from micro-biology to ecosystem processes, through institutions (e.g. Natural History Museum, French Research Institute for Exploitation of the Sea) that lead their fields in the development and dissemination of scientific knowledge. During the review period, France carried out an inventory of nearly 15 000 natural areas of interest for their ecology, fauna and flora in Metropolitan France and one of landscapes in 52 départements. The country has a comprehensive *body of laws* relating to the

protection of nature, biodiversity and landscapes. During the review period, laws on fishing, hunting and forests were added to the principal laws on nature, mountains, coastal areas and landscapes. Today *13.3% of Metropolitan France* is under protection, compared with 9.5% in 1996. Excellent progress is being made on regional nature parks and projects to enhance major sites. The joint involvement of public institutions, technical and financial partners, local authorities and volunteers in implementing natural heritage conservation projects should be noted. *Forest management* is developing more of an ecosystem approach, and eco-certification of woodland is accelerating. A more environment-friendly approach is also being taken in agriculture, for example with the conclusion of 40 000 sustainable farming contracts covering 3 million hectares. France is fulfilling its *international global nature conservation commitments* (e.g. Convention on Biological Diversity, CITES, Ramsar Convention) and contributes to progress in this area with initiatives such as IFRECOR on coral reefs. Following the French President's declaration at the Johannesburg Summit, a national sustainable development strategy was adopted in 2003 and a *national biodiversity strategy* was introduced in 2004 to help meet national, European and global challenges. In 2003, France created an ecological protection zone in the Mediterranean, extending more than 100 km off the coast.

However, major challenges remain. First, ratification of the biodiversity convention requires the introduction of mechanisms for the conservation of species, ecosystems and genetic characteristics. Several measures for the conservation of *species* and *habitats* exist, but relatively few for ecosystems and genetic diversity. Second, despite significant progress, application of the *EU directives* on birds and habitats is still patchy. Implementation of the *Natura 2000* network is lagging even after a decision against France by the European Court of Justice. The scientific, budgetary and institutional resources devoted to conserving *biodiversity in the overseas départements* are not proportionate to the exceptional wealth of that biodiversity. The Guadeloupe National Park, created in 1989, is still the only overseas national park, though other projects have been put forward. Conservation mechanisms cannot cope with the great pressure on *coasts and mountains*. For example, the Coastal Conservatory needs to step up its programme of land acquisitions (it now holds 12% of the coastline) and the law on coastal development needs to be consolidated and strictly enforced. The integration of biodiversity concerns into farming, forestry and tourism policies needs to continue. Intensive farming remains a source of considerable stress on biodiversity: farmland ecosystems contain France's largest number of endangered species. Greater recognition should be given to the *economically important ecological services* that biodiversity offers, especially as regards land use and prevention of environmental risks such as flooding and climate change.

♦ ♦ ♦

1. Objectives

In the framework of the Convention on Biological Diversity (Rio, 1992), which it ratified in 1994, France adopted a *wildlife action programme* (1996) with the following *objectives*:

- preserve *endangered species* through reintroduction programmes and conservation or restoration plans;
- implement an accepted *game policy* that complies with France's EU commitments;
- provide a legal framework for the *habitats and birds directives*;
- in the framework of Natura 2000, extend the network of protected areas with the aim of covering *15% of the national territory*;
- move *landscape policy* forward;
- develop *sound practice in farming and forestry*.

The *national biodiversity strategy*, adopted in 2004, followed on the 2003 national sustainable development strategy. The biodiversity strategy includes several operational action plans: a general action plan and sectoral plans relating to natural heritage, the sea, agriculture, urban and land-use planning, linear infrastructure and overseas territories.

France's performance can also be assessed in the light of the recommendations of the *1997 OECD Review*:

- develop and adopt a co-ordinated set of biodiversity objectives for habitats and species;
- make more resources available for biodiversity research;
- ensure that legal instruments for the protection of the countryside are implemented, particularly in the case of recently adopted instruments;
- increase the degree to which socio-economic and environmental considerations are incorporated in the designation and management of protected areas, as well as the public's commitment to such a policy, so as to improve safeguards against the pressures on such areas, particularly national parks;
- ensure that concerns relating to landscape protection are properly taken into account by national and local authorities in sectoral policies;
- give priority to measures aimed at sustainable development of agriculture, especially by assuring greater environmental consistency in agricultural support measures;

– ensure that environmental concerns are integrated into decisions at local level on urban development, infrastructure and tourist activities in coastal areas;

– proceed with the full implementation of the coastal law, notably by increasing funding for preparation of marine resource plans, and bring land use plans into line with the legislation;

– provide increased support to the Coastal Conservatory so as to rapidly conclude planned property transactions.

2. Biodiversity in Metropolitan France

2.1 Wildlife

The situation

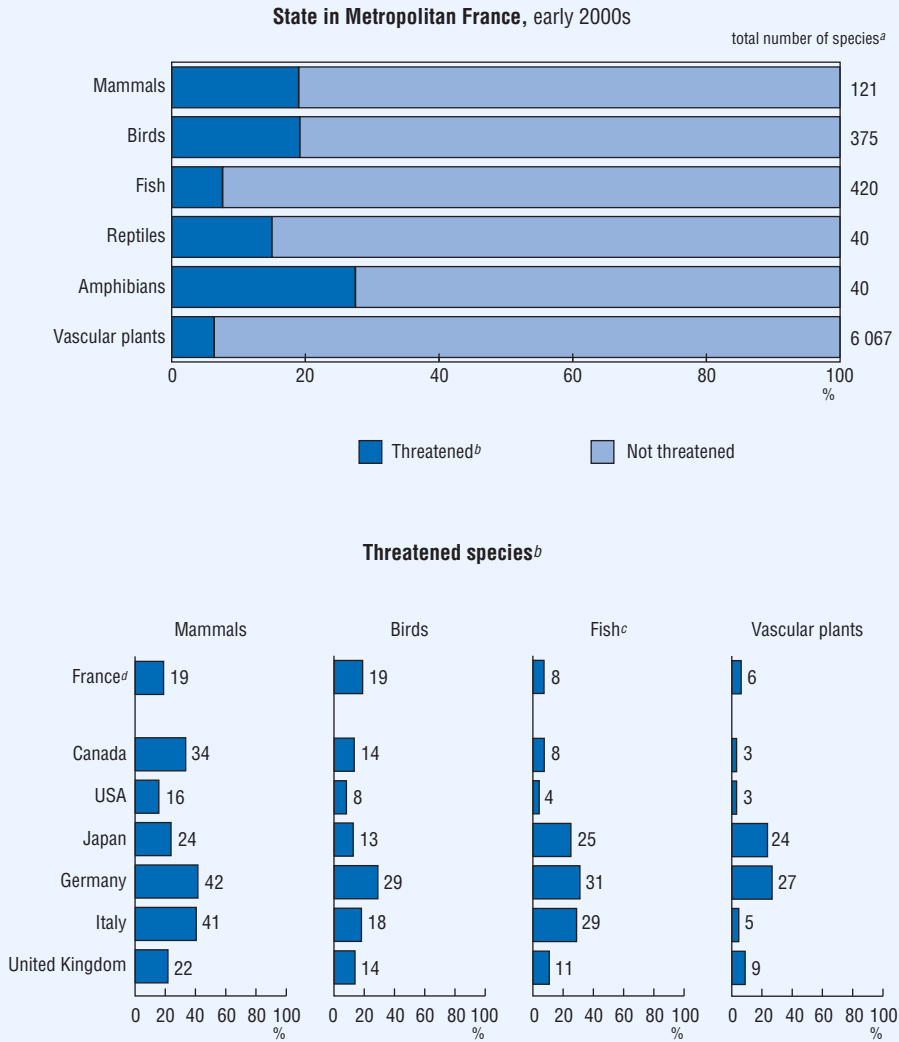
France has considerable *species diversity*, especially by European standards. It has, for instance, *43% of the vertebrate species of interest in the EU context* and ranks only behind Greece in terms of diversity of amphibians, mammals and birds. It has 40% of European flora on less than 12% of the continent's surface area. In addition, France is an *important biological crossroads*: many migratory species rest, feed and reproduce on its territory. Since the 1997 OECD Environmental Performance Review, the *number of threatened species* is apparently unchanged (Figure 4.1).

Concerning *birds*, 51 species are threatened. According to the French red list, the conservation status of 155 species (14% of the total) is unfavourable or fragile: populations of several species have more than halved, with trans-Saharan migratory birds particularly affected. The decline among bird species of forest and farm habitats is also quite marked (Figure 4.2).

Concerning *mammals*, 24 species (20%) are endangered or vulnerable. Apart from exploited species (stag, chamois, boar) and large carnivores (wolf, lynx, bear), whose return is often controversial, populations are difficult to track. A bat research network has shown that two-thirds of subspecies are endangered and two are becoming extinct. Seals have reappeared on the Picardy and Brittany coasts.

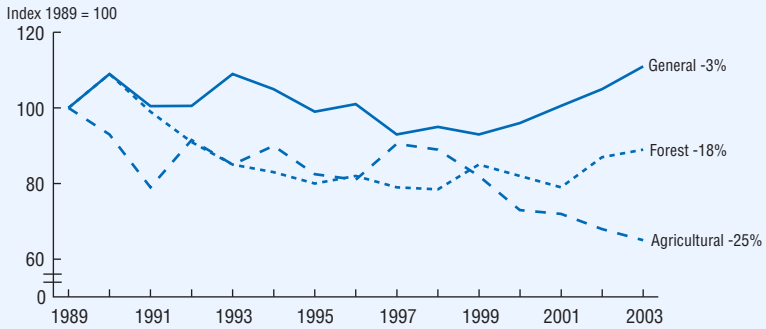
Concerning *fish*, out of 72 *freshwater species* (23 of them introduced), about 27 are threatened; several of these cases may involve engineering projects blocking migratory species' access to spawning grounds. Stocks of some marine species are a concern in certain areas, such as cod in the North Sea, partly because of overfishing. About 46% of species fished by France are subject to total allowable catch (TAC) rules.

Figure 4.1 **Fauna and flora**



a) Excludes extinct species.
b) IUCN categories "critically endangered", "endangered" and "vulnerable" in % of known species.
c) Freshwater fish only for the United States, Japan and the United Kingdom.
d) Metropolitan France.
Source: OECD, Environment Directorate.

Figure 4.2 **"Birds" indicators: trends in populations**



Source: National Natural History Museum.

Six species (16%) of *reptiles* are threatened, as are 11 species (30%) of *amphibians*. The decline in amphibian populations is attributed to the drying up of spawning places, especially ponds. Among the vertebrate groups, the status of amphibians is the most worrying. Both amphibians and reptiles are affected by pesticide use.

Information about *invertebrates* (insects, crustaceans, molluscs and echinoderms) is patchy. Concern is rising about several insects, including bees, that seem to be affected by the use of new pesticides.

France's *flora* numbers 6 067 species, of which 4 700 are indigenous. In the past century 34 species have become extinct. Today 387 species (6%) are considered threatened. The National Botanical Conservatories have begun protection programmes, though they do not yet cover the entire country or all species concerned.

Specific issues

The *introduction of non-indigenous species* is second only to habitat destruction as a direct cause of biodiversity loss. Invasive exotic plants in coastal areas, lakes and reservoirs compete with local species and can impede run-off and through-flow. International regulations on the discharge of *water ballast* and cargo residues from vessels in ports need to be enforced more strictly.

Plans to reintroduce and augment species have been implemented for the Corsican stag, the lammergeyer, the lynx, the bear and the griffon vulture. Some inventories show encouraging trends, but success will have to be measured in the longer term. Wolves have returned to France naturally from Italy since 1992, when they were first reported in the Alpes-Maritimes. They have continued to spread northward in the Alps and are now found in eight départements. The total population is now estimated at over 50 animals.

For birds, France has had difficulty both in bringing its regulations into line with *EU requirements on hunting seasons and methods* and in doing so on time. Hunting regulations have been a topic of debate by hunters' groups, environmental non-governmental organisations (NGOs) and public bodies. The European Court of Justice condemned France on 7 December 2000 concerning its application of the birds directive, especially as regards hunting seasons for migratory birds. The Conseil d'État accordingly nullified decisions on season openings or closings that did not comply with the directive, and the authorities thus had to define seasons in line with EU law, which improved compliance and helped calm the situation in 2004.

Difficulties have arisen regarding conservation of the *lynx, wolf and bear,* which are protected species under the *Bern Convention* and French regulations. Management of these species, especially wolf and bear, has caused serious tensions among rural livelihood groups, local elected officials and environmental NGOs. A wolf action plan was introduced in 2004 following a report from a working party comprising local elected officials, professional bodies, nature conservation groups and experts. Covering 2004-08, it includes the possibility, under certain conditions and in compliance with France's international commitments, of eliminating animals if they cause too much harm to livestock.

2.2 Natural areas and ecosystems

Protected areas

France has a large body of laws and regulations for protection of natural areas, depending on conservation needs and regional development options (Table 4.1). Overall, the main *protected areas* cover more than 13.3% of Metropolitan France, or some 1 230 square metres per inhabitant (Figure 4.3). Highly protected natural areas (IUCN category II) cover only about 0.5% of Metropolitan France, which has no totally protected areas (IUCN category I). Ten biosphere reserves, under UNESCO's Man and the Biosphere (MAB) programme, have been delineated.

France has seven *national parks*: six in Metropolitan France, covering a million hectares and attracting 6 million visitors a year, and one in Guadeloupe. Within these,

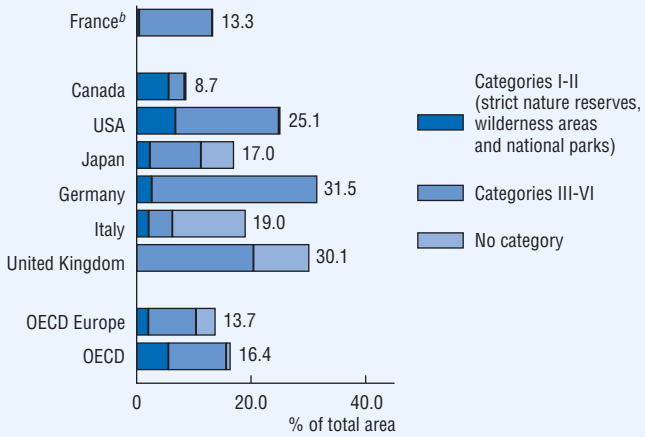
highly protected "central conservation areas" cover 370 000 hectares. Thus, national parks are not only isolated areas serving as nature reserves, but are part of the life of the communities in or around them. By supporting tourism they also meet economic and cultural development needs. A national parks bill has been introduced, emphasising the cultural and social dimensions and the role of local players. At the time of the 1997 OECD review there were plans to designate national marine parks in Corsica and the Iroise Sea, a park in French Guiana was "being created" and another, in Réunion, was under consideration. In the end, the Corsican project was dropped, and the other

Table 4.1 **Main types of protection of natural areas**

Types of protection	Number 1997	Number 2004	Surface area 2004 (hectares)	Supervision
Regulatory protection				
National parks[a]	7	7	1 278 000	MEDD
Nature reserves	130	156	546 000	MEDD
Voluntary nature reserves	139	153	16 000	MEDD
Biotope protection areas	426	516	275 000	MEDD
Protected forests	68	106	114 625	MAAPR[b]
Property ownership or control				
Sites acquired by CELRL[c]	348	530	70 500	CELRL
National biological reserves[d]	134	171	169 376	ONF[e]
Forest biological reserves[f]	6	33	4 114	ONF
Areas protected under contract				
Regional nature parks	32	44	7 100 000	MEDD
EU directives				
Special protection areas[g]	103	174	1 428 000	MEDD
Sites of community importance[h]		1 219	4 219 000	MEDD
International programmes				
Ramsar wetlands	17	22	820 000	MEDD
Biosphere reserves (MAB)	8	10	778 000	MEDD

a) Includes peripheral zones.
b) Ministry of Agriculture, Food, Fisheries and Rural Affairs.
c) Conservatory of Coastal and Lakeshore Areas.
d) Reserves in forests belonging to the state, including integral forest reserves and reserves managed as protection forest.
e) National Forestry Office.
f) Reserves in forests not belonging to the state.
g) 277 areas of importance for the protection of birds have been listed, of which 174 are classified as special bird sanctuaries.
h) 1 219 sites have been proposed under the "Habitats" directive.
Source: MEDD.

Figure 4.3 **Protected areas,**[a] 2004



a) IUCN management categories I-VI and protected areas without IUCN category assignment; national classifications may differ.
b) Metropolitan France only.
Source: IUCN.

national parks are still under consideration. Local authorities have created a public interest group with the aim of creating a national park on the coast near Marseilles and Cassis. No national park has actually been designated for 15 years, however. A planned amendment to the 1960 Law on the Creation of National Parks aims to get local players more involved in managing the areas adjacent to parks, which would become "adhesion zones". There are 156 designated *nature reserves* protecting habitats of great ecological value, such as mountains, forests, wetlands and moors. Other protected areas include voluntary nature reserves created under a flexible procedure at landowners' request, biotopes protected by prefectoral orders, national biological and forest reserves, national hunting reserves and protected forests (Table 4.1).

In the context of sustainable development, *regional nature parks*, created in 1967, are intended to assure balanced socio-economic development as part of a spatial management approach preserving the quality of their natural heritage and landscape, as each park's charter states. The charters have had legal force since 1993 and can oppose land use plans. As of 2004 France had 44 regional nature parks covering 13% of the country, a very positive achievement.

Despite some progress, nature protection efforts in France are not always up to the *pressures on the natural environment that economic activities pose*. For instance, the areas around parks have not always played their intended buffer role. One example involves the Vanoise National Park in Savoy, which draws 800 000 visitors a year. In its periphery are tourist accommodations totalling 300 000 beds. To allow refurbishment of the adjacent Val d'Isère ski slopes, a nature reserve was abolished, and the Bailletaz Reserve that was created in compensation is only one-third the size of the previous reserve.

Amendments to the 1985 Law on the Development and Protection of Mountain Areas have relaxed the rules on protection of natural areas and landscapes in the mountains. Parliamentary reports have proposed amending the Law on Coastal Development, Protection and Enhancement (usually called the coastal law) and supporting urbanisation of natural coastal areas. The need to *strictly control settlement in mountain areas* and to protect *natural coastal areas* should be reasserted (Box 4.1). The *management* of protected areas and the *financial resources* allocated to it may not be sufficient to achieve the related objectives. Using the IUCN classification, more protected areas in categories I and II might be advisable in order to improve the on-site conservation of biological diversity.

Coastal and lakeshore areas, wetlands

The *Conservatory of Coastal and Lakeshore Areas* has acquired over 860 kilometres of coastline and lakeshore (12% of the total), covering 70 000 hectares. It has been remarkably effective in curbing property development in coastal areas, and its approach remains a model of protection internationally. Conservatory sites attract over 20 million visitors a year, and some of them suffer from the extent of their popularity. An example is the Pointe du Raz in Brittany, which is being rehabilitated. The Coastal Conservatory acquires an average of 2 350 hectares a year. This rate would have to be nearly doubled to meet France's "unspoilt third" objective (keeping one-third of the coast in its natural state) and target of acquiring 200 000 hectares in 30 years. The Conservatory's investment budget, whose level was maintained in 2004 and 2005 through one-off operations funded under supplementary budget laws, should be increased accordingly and in line with land prices, and should be returned to a footing suited to multi-year programming. The Conservatory's work, though useful, is bound to be limited for financial reasons. It should operate within a context of strict enforcement of the coastal law, of which it is one of the instruments.

Wetlands are particularly important for the preservation of biodiversity but they are subject to many pressures, including agricultural run-off, the intensification of farming, and port and waterway development. The amount of land drained has been

Box 4.1 **Coastal areas: protection and development**

The *1997 Environmental Performance Review* recommended greater integration between different government levels as regards coastal area protection, particularly so as to reconcile nature protection and economic development objectives. It also recommended fully implementing the 1996 coastal law and bringing land use plans more into line with the law.

Strong pressures

Metropolitan France has 5 533 kilometres of coastline and its overseas territories 1 459 kilometres. Considerable environmental and economic interests are at stake in coastal areas. Coastal ecosystems are being *extensively denatured*: almost 60% of the coast is no longer natural. The main pressures are pollution by *organic matter* and *fertiliser* carried by rivers, causing green tides, as well as erosion; *leisure activities* (there are a million boats in Metropolitan France, and sales are rising by 20% a year) that crowd ports and generate residential and commercial property development; tourism, which accounts for one-third of jobs and over half of business turnover in coastal areas; and *shipping*, entailing accidents (such as those of the Erika, the levoli Sun, the Balu and the Prestige) that cause oil spills or chemical pollution and illegal discharges at sea. *Population density is increasing faster in coastal areas* than elsewhere in the country and is now 272 inhabitants per km^2, compared with 108 nationwide. The population of coastal communities more than doubles during the summer.

Instruments

The 1986 *coastal law* aims to integrate protection, enhancement and spatial planning for coastal areas, in pursuance of the objective of preserving the "unspoilt third". The law forbids construction within 100 metres of the shore, gives the public access to all beaches and encourages the use of maritime enhancement plans (SMVM).

The coastal law has helped *make urban planning more rational* (e.g. by favouring extension of existing settlements and restricting food processing installations) as well as identifying important nature areas on the coast and improving access to the sea via some 1 600 kilometres of coastal pathways. But its application is not easy, given the shorter-term interests of some local authorities, especially regarding urban planning.

The aim of the SMVMs is to assure consistency between environmental and economic imperatives. In institutional terms they form a bridge between the coastal law and other planning instruments, such as local zoning plans. Results have been mixed, however. Difficulties in arranging consultations among the various stakeholders have delayed elaboration of the plans. Only one *SMVM* has been finalised, two are well along and seven are under consideration.

Box 4.1 **Coastal areas: protection and development** *(cont.)*

The *Coastal Conservatory* contributes to effective protection of parts of the French coast and plays an important (and internationally innovative) role in coastal area management. It buys sites to protect them and generally delegates their actual management to local authorities. French tax law allows certain types of land to be donated to the Conservatory in lieu of inheritance tax.

increasing for several decades, except on the Mediterranean coast. In 1992 France adopted an objective of strict preservation for at least two-thirds of remaining wetlands. No inventory of wetlands has been made since then. But judgements by the European Court of Justice for failure to comply with conservation-related directives in the Seine estuary and Poitevin fenlands, along with the rate of wetland drainage and deterioration, suggest this objective has not been met. Nevertheless, a preliminary inventory has counted 87 major wetlands (i.e. over 1 000 hectares each), covering some 2 million hectares in all. Some are protected areas and are part of the Natura 2000 network. Wetland protection is an important aspect of a new rural development bill, which would confer public interest status upon wetlands and provide for property tax exemptions.

Natura 2000

The *Natura 2000* ecological network, initiated in 1993 and now being established Europe-wide, consists of designated sites under the terms of the EU birds and habitats directives. France has designated 1 209 sites under the habitats directive, covering 4.2 million hectares (including 500 000 offshore). French sites under the birds directive cover 1.2 million hectares (2.2% of the territory). These sites do not include all existing protected areas (7.3 million hectares), and some are in addition to sites already protected. In a circular dated 23 November 2004, the minister for ecology and sustainable development informed prefects of his intention to complete the Natura 2000 network by 2006, including site designation and preparation of an objectives document for each site.

The European Court of Justice ruled on 26 November 2000 that France had not implemented the birds directive properly, especially as regards its designation of the *special protection areas* (SPAs) called for by the directive. In April 2004 the European Commission notified France that its classification of areas most appropriate for wild bird conservation as SPAs was insufficient and that it would be fined if it

failed to remedy the situation. France's network of SPAs is the smallest in the EU at 2.2% of the territory. SPAs afford extra protection to the birds that live in them and pass through them. Not giving SPA status to major wetlands and other sites harbouring rare or endangered species of wild birds compromises conservation efforts. France's network of *special conservation areas* under the habitats directive is also relatively small: 7.6% of the territory, compared with the EU average of 14.4%.

The government has opted for contracts with landowners to assure the management, restoration and conservation of habitats and species covered by the EU directives. This approach poses *problems involving funding*, verification, consistency of local planning policies and permanence of sites, especially in forest and farming areas. France is still among the countries showing the most meagre results as regards application of the habitats directive. Resistance from local elected officials and hunters' groups explains much of France's difficulty in designating sites. A solution to such stand-offs is urgently needed. Implementation of the habitats directive is an unavoidable requirement, as all players concerned should now realise.

Ecosystems, forestry and farming

Recognition of the role of *ecosystems* in the provision of ecological services of economic importance has progressed in France, for example in efforts to prevent flooding and address climate change. *Flood prevention measures* have led to better integrated, more ecologically sound management of river basins (Chapter 3), which in turn can result in actions to better protect wetlands, clean up rivers and restore the habitats of migratory fish such as sturgeon and salmon. Measures taken by some subnational authorities in these areas are exemplary (Box 4.2). Afforestation of water-courses stabilises their banks, reduces increases in water temperature, inhibits flooding and filters out pollutants carried by floodwater. In France, however, less than 20% of the length of watercourses 15 metres wide or more has wooded banks of at least 250 metres on each side. From 2005, as one of the conditions on farm subsidies under the EU's Common Agricultural Policy (CAP), farmers have to establish grass strips, first along watercourses, then at breaks in slope and in protection perimeters of public water supply sources. The area planted is supposed to equal 3% of the surface area they have planted with cereals, oil seeds and pulses. Afforestation should be among the activities promoted in natural risk prevention plans. Another economic consideration in ecosystem management is *carbon sequestration* as a climate change abatement measure.

With 80% of the French population living in towns and cities, intensively farmed areas alternate with depopulated, sometimes marginalised rural districts, while natural areas predominate along the coastline and in the mountains (Boxes 4.1 and 4.3).

Box 4.2 **Restoration of Lake Bourget**

The integration of *environmental protection and regional development* in the Savoy département is reflected in an ambitious sustainable development project for the greater Lake Bourget area. Due for completion by around 2015, it focuses on water, natural heritage, landscape, mobility and the economy. Various government levels and agencies, including municipalities, have formed the Grand Lac public interest group to co-ordinate their actions, with financial and technical support from many partners.

The lake is covered by the habitats and birds directives and is a *Ramsar* site. The project has received EU financial support via the *LIFE programme* for measures to restore the lake, especially the southern marshes, and to reintroduce the European pond tortoise, an endangered species.

The *measures being taken* concern prevention of accidental pollution, protection from flooding, awareness raising among children and adults, development of eco-industries, enhancement of historic urban and rural sites, development of intercommunal land use planning and the preservation and restoration of natural environments. The budget for 2000-06 is EUR 450 million.

Regional development efforts and devolution are the chief approaches to reducing excessive pressure from economic activities on the natural environment and landscapes. Regional and local authorities are playing a greater role in administering regions and municipalities. Binding land use documents such as territorial cohesion plans and local zoning plans need to take better account of the natural environment, for example in the framework of planning contracts between central and regional authorities, municipal environmental charters and regional nature parks' charters.

Agricultural output has risen steadily, increasing by 30% between 1980 and 2000 despite a 5% decrease in land under cultivation, through increasingly intensive farming marked by more use of fertiliser, pesticides, irrigation and drainage (Figure 4.4). In addition to the potential effects on human health from this trend, related declines in water quality and quantity can affect reproduction in certain species. The drainage of land near Ramsar wetlands is also worrying. Pressure on wetlands and pesticide use remain the principal causes of vertebrate species becoming classified as threatened.

Substantial tracts of farmland are classed as *nature areas of interest for their ecology, flora and fauna* (ZNIEFF). Launched in 1982 on the initiative of the Ministry of the Environment, predecessor to the Ministry of Ecology and Sustainable

Box 4.3 **The mountains: growing pressures**

Mountain ecosystems are home to almost 45% of the country's protected *plant species* (128 of which are found only in the mountains) and 87% of protected *mammal species* (ten of them living exclusively in the mountains). There are programmes to *reintroduce* several threatened species, such as wolves and bears. A majority of potential Natura 2000 areas are in the mountains, as are five of Metropolitan France's six national parks. The *retreat of glaciers* that began in the mid-19th century has accelerated in recent decades: the surface area of glaciers in the Pyrénées has shrunk from 34 km^2 to 6 km^2, and the Argentière glacier in the Alps has receded by 1 000 metres.

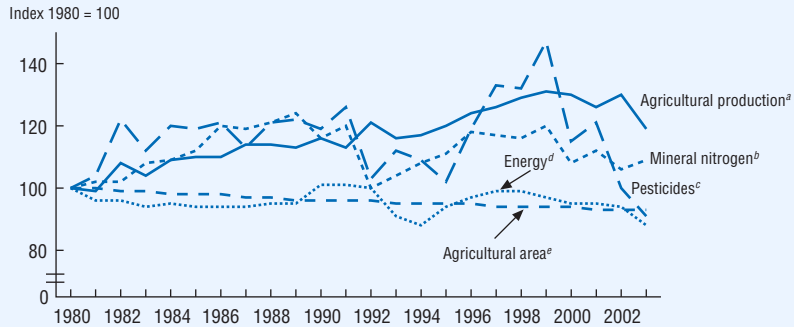
Downhill skiing is a source of considerable pressure, entailing increases in man-made features at high altitudes, landscape modification, slope preparation requiring earthworks, clear-cutting in forests and the erection of pylons. Erosion and landslides often result. Many ski resorts are on the peripheries of national parks. While capital expenditure seems to have stabilised in recent years, investment in snow-making equipment has doubled. Sometimes bacteria are added to the water to raise its freezing point. Such measures disturb stream regimes, high-altitude water sources, wetlands and Alpine pastures. The use of snow guns in skiing areas has become a cause for concern among mountain conservation groups.

Transport contributes to the fragmentation of mountain ranges, is a pollution source and causes landscape deterioration. Goods transport volumes across the Alps and Pyrénées are rising steadily as a consequence of trade liberalisation in the European Union (Chapter 2). The Somport tunnel is the first major tunnel cutting through the Pyrénées. Transmission of electricity exports to Italy and Spain compounds these negative effects.

Farming and herding, which play a part in maintaining landscapes and biodiversity, are declining in area at the same rate in the mountains as elsewhere in France (by about 7% per year), despite the introduction in 1972 of national and EU support programmes devoted to reducing the income differential between highland and lowland farmers. Increases in flock and herd size lead to localised overgrazing and the abandonment of smaller pastures. The spread of tourism infrastructure and the extension of roads to 75% of high-altitude pastures facilitate the penetration of motor vehicles into protected areas.

Much is being done to contain such pressures. Measures include the designation of regional nature parks by subnational authorities; national laws on mountains, regional planning and the management of forests, water resources and risks; and, at international level, the Salzburg Convention on the Protection of the Alps and its protocols. However, a tendency to ease the rules protecting farmland and natural areas from urbanisation and the building of second homes is evidenced in legislation passed or pending in 2003 and 2004.

Figure 4.4 **Eco-efficiency of the agricultural sector**



a) In volume.
b) In thousand tonnes of fertiliser.
c) In tonnes of active ingredients.
d) Final energy consumption in million tonnes of oil equivalent.
e) In thousand hectares.
Source: INSEE; Ministry of Agriculture; Ministry of the Economy; Unifa; UIPP.

Development (MEDD), the ZNIEFF inventory is a tool providing information about France's natural heritage. There are two types of ZNIEFF. A Type I area is generally relatively small and harbours species, combinations of species or environments that are rare, remarkable or typical of the national or regional natural heritage. Type II areas are large, rich natural areas that are relatively unaltered or offer considerable biological potential. A Type II area can include one or more Type I areas. Farmland accounts for 24% of Type I areas and 36% of Type II areas. Hence the importance of nature conservation on agricultural land, which may be carried out through an objectives document under the habitats directive. In an effort to move towards sustainable development practices in agriculture, some 50 000 of the largest farms adopted plans to control pollution of agricultural origin between 1994 and 2002. In addition, 49 000 regional farming contracts (renamed sustainable farming contracts in 2003) have been concluded, covering 3 million hectares.

Forests cover 15 million hectares (28% of the territory), and the figure is *rising* due to abandonment of farmland and incentives for farm forestry under the CAP. Substantial areas of forest are classed as Type I or Type II ZNIEFF, which shows their ecosystem diversity. *Forest fires* continue to cause considerable damage, especially in Mediterranean regions, despite increased firefighting resources. Storms in 1999 blew

down over 300 million trees. This disaster resulted in much consideration being given to ways of *making forestry ecologically sound*, with decreased monoculture and more awareness of biodiversity needs. In addition, the area of *eco-certified* forest, negligible in the late 1990s, had reached almost 1.5 million hectares by 2003 under the pan-European sustainable forest management certification system (PEFC), adopted in 2000.

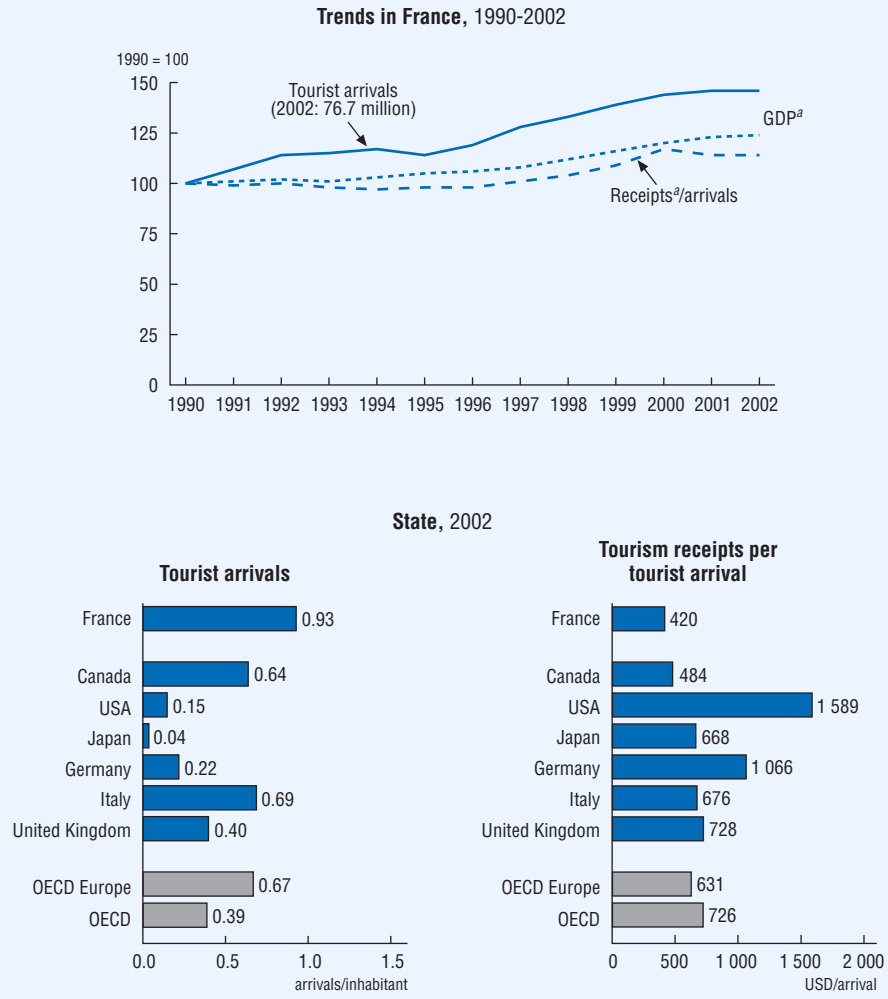
3. Landscapes

Landscapes in Metropolitan France and its overseas départements are a *high-value natural asset* and a major factor in the *development of tourism and the economy*, since France is the world's leading international tourist destination (Figure 4.5). A range of appropriate legal measures exists to protect and manage the country's landscapes.

The law of 2 May 1930 on the *protection of natural sites* has proved effective, with 5 100 listed sites and 2 700 classified sites. Each year, ten to twenty sites are added to the list of classified sites; 17 new sites were classified in 2003. Particular attention has been paid to enhancing the best-known and most frequently visited sites, which attract 25 million visitors a year. Out of 46 major site operations that have been launched at an average cost of EUR 4 million, eight have been completed and 18 are in progress. A government label, filed with the National Intellectual Property Institute in 2003, was awarded to four major sites in 2004. A network of major French sites, set up in 2000 and supported by MEDD and the Secretariat of State for Tourism, brings together 30 local authorities responsible for managing sites. The clear success of this initiative, based on the joint commitment of local authorities and central government, underlines the positive link between active protection of the landscape and the development of tourism and the economy. The policy on major sites is likely to be strengthened and benefit from greater financial support in coming years. France's signature of the European Landscape Convention at Florence in 2000 commits the government to introducing measures to protect, manage and create landscapes in both ordinary and exceptional rural and urban areas, and to improving public knowledge and awareness of this process along with public participation.

France, almost 60% of whose territory is farmland, gives legal recognition to *agriculture's role in landscape protection and management*. The 1993 Law on Landscape Protection and Enhancement recognises the importance of addressing quality for all landscapes. Article 1 of the 1999 Framework Law on Agriculture cites landscape maintenance as one of the multiple functions of agriculture. The specifications for many products of designated origin or other labels explicitly refer to landscape protection. Agricultural policy measures have an effect on the maintenance

Figure 4.5 **International tourism**



a) At 1995 prices.
Source: World Tourism Organization; OECD.

and quality of landscapes, especially through conditions attached to subsidies (e.g. regarding land maintenance and grass strips) and support for farming in mountain areas (e.g. natural disadvantage compensation payments).

The landscape issue is also covered by spatial planning legislation, including the mountain and coastal laws, and by environmental impact assessments. Territorial cohesion plans and local zoning plans must provide for protection of high-quality landscapes. Architectural and urban heritage protection areas now include landscape. The 1991 national environment plan was followed by the *1993 Law on Landscape Protection and Enhancement*, which gives landscape a legal status in the context of national spatial and development planning. The law recognises regional nature parks as a priority framework for action by public authorities to preserve the landscape. It prescribes measures designed to reconcile construction with landscape protection and enhancement. A *National Landscape Council*, set up in 2000, reports on trends, reviews developments under the legislation and makes proposals relating to landscape policy. The law led to production of *landscape atlases* to facilitate consultation among the parties involved. At département level, 52 atlases had been published by 2003 and 27 were being prepared; nationwide coverage should be completed in 2006. The law's provisions on landscape guidelines, however, have not been implemented.

More *specific measures* have been taken to protect landscapes. Charters to limit the proliferation of *electricity pylons* have led to 26% of French power lines being buried. For *advertising displays*, there are many regulations and mechanisms for consultation between local elected officials and advertisers, aiming especially to prevent illegal displays. For *railway main lines*, stricter environmental impact studies such as those for the Mediterranean high-speed link have resulted in the planting of around a million trees and shrubs and the creation of wildlife corridors. For *motorways*, since the early 1990s 1% of new projects' budgets has had to be devoted to landscaping, so new road infrastructure is better integrated with the surrounding landscape and itself is better landscaped.

The many tourists who visit France each year are particularly attracted by traditional country areas and customs. Preserving this *rural cultural heritage* and enabling people to continue to live in and maintain the countryside is an integral part of rural development policy and makes a substantial contribution to landscape protection.

4. Overseas Territories

Rich but threatened biodiversity

Although France's overseas territories are a quarter the size of Metropolitan France, they have a *much more diverse natural heritage*: they represent 14 ecoregions

(as defined by WWF), compared with three in Metropolitan France, and are endowed with exceptional biological diversity (Table 4.2). They include habitats of global importance, such as the tropical rainforest and mangrove swamps in French Guiana and the tropical islands, the coral reefs of the Pacific islands and the French Southern and Antarctic Territories. Some of these are among the 25 world biodiversity hot spots identified in 1990. New Caledonia, for example, has more endemic species than any place in the world except Madagascar.

The status of some of these species is *worrying*, however: 24% of mammal species, 12% of bird species, 25% of reptile species, 20% of amphibian species, 30% of freshwater fish species and 12% of plant species are in danger of extinction in France's island dependencies. Insularity is the main reason not only for the uniqueness or endemism of several wildlife species, but also for their fragility. *Hunting* continues to limit species populations in some overseas communities; this affects, for example, sea turtles in the French West Indies and Réunion. Over-exploitation of species for *trade* in wild animals and rare trees is another factor. Bottom-dwelling marine species, including spiny lobster, white sea urchin and spider conch, are overexploited in Mayotte, Réunion and the French West Indies. Human populations have *grown considerably* in the overseas départements in the last ten years (by 14% overall, by 37% in French Guiana). As the *population is concentrated in coastal areas,* this puts considerable pressure on shore and reef habitats.

A need for increased protection

French laws and regulations on matters such as nature protection, water and coastal areas apply in the *overseas départements*. The EU habitats and birds directives do not apply, since their scope is limited to Europe. In all the overseas départements, efforts and resources devoted to enforcing laws and regulations are insufficient.

Protection of biologically important *natural areas* in the overseas départements remains limited (Table 4.3). They include a single national park (created in Guadeloupe in 1988), 13 nature reserves, 172 biological reserves in state-owned forests and 33 biological reserves in forests owned by local authorities. Proposals to create national parks are under consideration for Réunion and French Guiana. Four nature reserves are planned, one in French Guiana, one in Guadeloupe and two in Réunion. Concerning wetlands, only a reef site in Guadeloupe is listed under the Ramsar Convention and as a UNESCO-MAB biosphere reserve. Essentially, the effective application of natural heritage protection measures in the overseas territories is extremely limited. The relevant authorities need to increase their attention to this issue, given the ecological value of the areas concerned and the requirements of related international conventions.

Table 4.2 **Number of indigenous species,** Metropolitan France and overseas territories

	Metropolitan France	French Guiana	Martinique	Guadeloupe	Réunion
Vascular plants	4 900	5 350	1 863		750
Continental molluscs	660	97	59	91	68
Amphibians	34	108	1	3	0
Land reptiles	33	158	8	21	3
Nesting birds	276	718	65	70	18
Land mammals	97	183	11	14	2

Source: French IUCN Committee.

Table 4.3 **Protected areas in overseas départements,** 2004

(km^2)

Types of protection	French Guiana	Martinique	Guadeloupe	Réunion
Regulatory protection				
National parks[a]	–	–	335 (1)[b]	–
Nature reserves	2 933.52 (5)	5.23 (2)	89.56 (4)	37.11 (2)
Voluntary nature reserves	24.64 (1)	–	–	0.30 (1)
Biotope protection areas	928.16 (5)	0.15 (3)	9.28 (7)	18.18 (2)
Control of land				
Land acquired by CELRL[c]	33 (9)	15.86 (8)	5.23 (10)	7.66 (9)
National biological reserves[d]	1 103 (1)	–	–	138.78 (7)
Protection under contract				
Regional nature parks	6 998 (1)	701.50 (1)	–	–
International programmes				
Ramsar wetlands	1 960 (2)	–	241.50 (1)	–
Council of Europe biogenetic reserves	–	5.17 (1)	–	–

a) Includes peripheral zones.
b) Number of areas in brackets.
c) Conservatory of Coastal and Lakeshore Areas.
d) Reserves in forests belonging to the state, including integral forest reserves and reserves managed as protection forest.
Source: MEDD.

5. International Commitments

The *national biodiversity strategy*, adopted in 2004, is based on a diagnosis of the state of pressures and defines a framework for action programmes. It emphasises sectoral policies regarding the use of ecosystems and resources in Metropolitan France and overseas, in consultation with the ministerial departments concerned (those dealing with agriculture, fisheries, forests, spatial and development planning, culture, urban planning, tourism, sport, education and research, and the overseas territories) and with all private sector and civil society stakeholders. The strategy sets out the objectives to be met, including those related to EU directives and international commitments, and underlines France's responsibility for its overseas territories. It provides a framework for assuring consistency between policies regarding protection and management of the natural heritage and sectoral policies, and it defines France's international action. It is backed up by action plans, especially for the overseas territories and the natural heritage, and indicators to enable progress towards meeting the objectives to be monitored.

Concerning tropical forests, the close links and overlaps between environmental, economic and development concerns explain why the international community has taken so long to draw up an effective preservation strategy. Such a strategy is now being put in place, however, particularly through work programmes on forests related to the Convention on Biological Diversity, the United Nations Forum on Forests and the International Tropical Timber Organization. In April 2004 France published a *tropical forest action plan*. France is the only industrial nation with extensive tropical forests: 8 million hectares in the overseas territories, mainly French Guiana. A key feature of the action plan is the creation of national parks in Réunion and French Guiana, once the law amending the 1960 Law on the Creation of National Parks, and associated implementing decrees, have been published. A uniform transboundary protected area will be created with Brazil's Tumucumaque National Park, to be managed in close co-operation with Brazilian authorities.

France has 22 *Ramsar sites*, three of them overseas; in all they cover some 816 000 hectares. Most were designated in the first half of the 1990s, though five of them, which added 5% to the surface area, are more recent. The latter include the Lake Bourget area in the Rhône-Alpes region. France is working with Germany for Ramsar classification of both banks of the Rhine as a single site.

The *overseas territories* are affected by several international agreements of regional scope with nature protection objectives: the Apia Convention (1976), the Cartagena Convention (1983), the Nairobi Convention (1985) and the Nouméa Convention (1986). The French Coral Reefs Initiative (IFRECOR) has promoted protection and sustainable management of France's coral reefs since 1999.

As regards *marine environments*, areas of interest in terms of natural heritage are being identified. Areas designated under the *habitats directive* cover 500 000 hectares of sea. Thirteen nature reserves have been created in the islands and maritime public domain areas. A marine sanctuary for cetaceans, an international innovation, was set up in 1999, covering 83 833 km^2 in the Mediterranean, including waters outside national jurisdictions (Chapter 8). The agreement establishing the sanctuary commits France, Italy and Monaco to draw up a marine mammal conservation plan for the Ligurian Sea, between the Côte d'Azur, the Gulf of Genoa and Corsica. In 2003 France established an ecological protection area in the Mediterranean to aid in controlling pollution from shipping. Backed by five other European countries, France has made a proposal to the International Maritime Organization concerning protection of an extensive and particularly vulnerable maritime zone.

6. Financing for Nature Conservation

Estimates by the Environmental Accounting and Economics Commission in 2004 indicate that *national expenditure on biodiversity and landscapes* amounted to EUR 908 million in 2002 (or 3.2% of total environmental protection expenditure), 7.6% more than in 2001. Of this, EUR 473 million was government expenditure and EUR 435 million corporate.

The *contribution of central and subnational government has increased* since the 1997 OECD review. The regions devote 15% of their environmental expenditure to protecting landscapes and biodiversity, an annual average of EUR 35 million, compared with EUR 177 million at département level. Between 1997 and 2003, central government funding of nature and landscape protection rose steadily, not least because of the need to finance the establishment of the Natura 2000 network to the tune of some EUR 18 million per year. The rise levelled off in 2002-03 and *the trend is now downwards*, with an 11% decrease from 2003 to 2004. The budget of the Coastal Conservatory was cut, and although exceptional allocations were made in 2004 and 2005, it is unlikely that at its current funding level the Conservatory will be able to meet the acquisition objectives in its multi-year programme. While substantial resources are now allocated to the management of national parks, the current amounts do not take into account future needs for the national park projects still "under consideration", which may finally come to fruition.

Finally, to meet growing demand, *more resources* should be allocated to *protection of destination sites* in general and to major site operations in particular, especially given that some major site agreements concluded between central government and local authorities have not been followed up with the necessary funding.

6.1 Funding and local taxes

A *département tax for sensitive natural areas*, levied on construction of single-family houses, is entirely earmarked for nature conservation, on the principle that urban expansion and infrastructure additions should be offset by action favouring nature. This one-off payment, imposed when a building permit is issued, is equivalent to up to 2% of the construction costs (it is zero in some instances). Revenue from the tax could be doubled, representing additional annual income of around EUR 100 million, by setting a minimum rate of 1% and introducing legislation to make the tax compulsory (currently 29 out of 100 départements do not levy it). The tax could also be extended to major infrastructure projects, such as high-speed train links, high-tension power lines, industrial waste disposal sites, incinerators, quarries and motorways, thus generating considerable funds. Motorway construction is already subject to the 1% landscape requirement, the revenue from which is allocated to landscaping.

General operating grants can give municipalities considerable financial resources. The central government allocates the grants to the départements, which then divide the funds among municipalities, thus providing a form of re-equalisation. The size of municipal allocations is mainly based on criteria related to demographics and economic development. The criteria could be widened to include indicators of municipal nature conservation efforts, such as the extent of protected areas.

Raising the level of fees related to tourism, such as accommodation taxes, parking fees and hunting licence fees, would not generate substantial resources, so it seems more sensible not to jeopardise the essential contribution that tourism makes to local development. For example, the *accommodation tax* instituted in 1910 for hotels and campsites is less than a euro per tourist-night at most, and the revenue is mainly spent on tourism development; only 1-1.5% goes to nature conservation. The rate, and the proportion allocated to nature conservation, could both be increased. But the poor yield from the tax (which many hotel keepers do not declare) and the narrowness of the tax base (only 5% of municipalities levy it), combined with the discontent such a measure would produce, militate against such a move.

As most natural assets belong to private owners, restrictions or easements linked to nature conservation could be rewarded by an *easing of the land tax or estate duties*. For example, there is a plan to exempt property in Natura 2000 areas from the land tax. To minimise nature conservation costs, economies of scale should be emphasised, which implies greater use of various forms of partnership.

6.2 Common Agricultural Policy

Agri-environmental support is low (2-3%) compared with direct subsidies under the CAP, nor does the amount per hectare (EUR 150) compare with direct support (EUR 250-600). In départements where aid for irrigated crops is much higher than that for non-irrigated crops, direct support linked to average yield encourages intensive farming and irrigation. The effects of the July 2003 CAP reform are still unknown, in particular concerning the preservation of agricultural activity in large areas of considerable interest in terms of biodiversity. Making aid conditional on environmental criteria will enable significant improvements to be made, though without accomplishing a complete shift to sustainable agriculture.

5

ENVIRONMENTAL-ECONOMIC INTERFACE*

Features

- Sustainable development: institutions, strategy
- Environmental Charter
- Market-based integration: subsidies, taxes
- Environmental policy
- Economic instruments
- Prevention of natural and technological risk

* This chapter reviews progress over the last ten years, and particularly since the previous OECD Environmental Performance Review of 1997. It also reviews progress with respect to the objective "decoupling environmental pressures from economic growth" of the 2001 OECD Environmental Strategy, and takes into account the latest OECD Economic Surveys of France.

Recommendations

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

- continue to reform existing *environmental taxes* to take better account of environmental externalities and eliminate the environmentally harmful aspects of *energy and transport taxation*;
- continue efforts to *reduce environmentally harmful subsidies*, and systematically examine all types of *support programme* from the standpoint of their net impact on environmental effectiveness and economic efficiency;
- ensure that national and EU policies relating to *environmental impact assessment and strategic environmental assessment procedures* are fully implemented, including at subnational level;
- more explicitly integrate an economic dimension when implementing the *national sustainable development strategy*, and promote integration of environmental concerns into sectoral policies (e.g. for agriculture, transport and energy);
- strengthen the role of *indicators* in measuring environmental and sustainable development progress and in policy formulation;
- set up a network of regional and national environmental authorities to manage EU *structural funds* with the aim of better integrating the environment and sustainable development into regional policies and programmes;
- establish a *green tax commission*, attached to the Prime Minister;
- increase *rates of environmental taxes and charges*, thereby increasing their incentive effect and reducing the budgetary cost of government environmental policies;
- ensure that economic instruments are introduced to address *externalities associated with agriculture*;
- in water management, maintain the *basin-wide approach* and setting of charges by the river basin authorities in a context of overall control by the Parliament;
- continue to strengthen *enforcement of environmental regulations*; improve their integration in land use planning documents, including at local level; strictly apply the laws on risk, mountains and coastal areas, including at local level;
- continue to carry out *economic studies* necessary for efficient action on the environment.

Conclusions

The integration of environmental concerns into economic, social and sectoral decision making is essential to improving environmental performance and moving towards sustainable development. Such integration, whether effected through institutions or through market mechanisms, is also needed to achieve *cost-effective responses* to environmental challenges. Economic forces and changes in such major sectors as energy, industry, agriculture, transport and tourism strongly influence environmental conditions and trends, and hence can either enhance or diminish the benefits of environmental policy.

Integration of environmental concerns in economic decisions

France has successfully *decoupled* several environmental pressures from economic growth, including SO_x and NO_x emissions, freshwater abstraction and pesticide and nitrogenous fertiliser use. Several major *institutional and legislative reforms* have been made since 1996 to assure better integration of economic and environmental objectives and to promote sustainable development. The national sustainable development strategy was approved in 2003. The authorities apply the polluter pays and user pays principles, so both direct and indirect subsidies for environmental protection are generally minimal. The new EU directive on *strategic environmental assessment*, together with better environmental impact assessment procedures, should help improve integration in programmes and plans as well as projects. The National Health and Environment Plan is a major step forward, as is the integrated risk management policy. Other progress includes the elimination of environmentally harmful *subsidies* (with the end of coal support) and the introduction of cross-compliance in farm support. The recent reforms of the EU's Common Agricultural Policy have also tended to dissociate farm subsidies from environmental pressures. Environmental decision making has been made more coherent through various *consultation mechanisms* (e.g. the National Commission for Public Debate, the 2003 national sustainable development strategy and preparation of the water development and management master plans) and through joint management mechanisms (e.g. territorial contracts on coastal areas and Natura 2000 sites).

The implementation of the *national sustainable development strategy* could usefully focus more on market-led integration of environmental concerns in such economic sectors as agriculture, transport, energy and tourism. Many *price signals* are inadequate, given, for example, the long-term decline in real fuel prices, the continued tax advantage of diesel over petrol (to the benefit of road hauliers) and reduced prices

for water used in agriculture. Radioactive waste management (e.g. in the very long term) should be fully built into the cost of nuclear power so as to reflect relative costs. In the current state of knowledge, the nuclear sector's external costs (e.g. radioactive waste management) are only known in their broad outline. In this context, the major service providers have taken steps to meet those costs that are presently known and measurable. Most decisions about *subsidies* are still based on availability of financial resources rather than expected environmental or economic outcomes. *Taxes* take little account of environmental externalities, and some aspects of transport and energy taxation are harmful to the environment. Problems remain, especially at *local level*, with integrating environmental concerns into economic decisions and with achieving economic efficiency in implementing environment policies. Growth in *road transport of goods* continues to be a major cause for concern.

Implementing more efficient environmental policies

France has a vast, coherent body of environmental legislation that is consistent with the principle of subsidiarity. The *Environmental Charter* approved in 2004, was incorporated into the Constitution in February 2005. The 2000 *Environment Code* provided an opportunity to clarify France's environmental legislation, which has both influenced and been influenced by EU environment law (e.g. as concerns integrated pollution prevention and control for France's 68 000 classified installations). The *new law on risk* permits better economic assessment of natural and technological risk in spatial planning. Environmental policy implementation is carried out through a *balanced package of instruments* including regulation, economic instruments, planning and voluntary approaches. Enforcement of environmental regulations has benefited from a strengthened inspection system. A wide range of *economic instruments* is used. Charges for water services and waste management, and some other economic instruments, are used effectively. Several environmental taxes (as part of the general tax on polluting activities) were created. New instruments, such as trading in greenhouse gas emission permits, are being developed. Planning tools (e.g. state-regional contractual plans, climate plan, health and environment plan) and the system of land use planning play their part. Better institutional integration of economic concerns within environmental policies has been made possible by remarkable progress on *economic studies* and environmental assessments within the *Ministry of Ecology and Sustainable Development*. *Environmental protection expenditure* has risen to 1.9% of GDP and total environment-related expenditure (including water services and material recycling and recovery) to 2.8% of GDP. There is no indication that environmental action has affected the competitiveness of the French economy as a whole.

Nevertheless, local implementation of *laws and regulations* relating to the environment and land use should be improved, including the laws concerning risk, coastal areas and mountains. Some EU directives, such as those on nitrates, urban waste water, birds and habitats, pose problems. Much work is still needed to address water pollution from urban and agricultural run-off. Possibilities for co-operative efforts on nature and biodiversity protection could be further explored. For some *economic instruments*, rates need to be adjusted so as to better internalise positive and negative externalities. The major drive for *environmental tax reform* begun in 1999 did not come to fruition. An in-depth examination of the environmental effects of taxes and subsidies should be done, and requires the establishment of a green tax commission.

♦ ♦ ♦

1. Sustainable Development

1.1 Decoupling environmental pressures from economic growth

GDP grew relatively slowly over 1990-2003, at 2% a year (Box 5.1). Thus, *France's economy* expanded by 26%, while the population grew by 5%. Industrial output rose at a slower pace than GDP, by 13%, and agricultural output fell by 2% (Table 5.1). Growth in energy supply and use mirrored the increase in industrial output. Energy intensity fell by 6% to a level slightly higher than the OECD Europe average (Chapter 7). Goods transport by road rose faster than GDP, by 34%.

Emissions of pollutants fell both in relation to these economic trends and in absolute terms. In particular, SO_x emissions fell by 59% and NO_x by 32%. Pressure on the water supply has levelled off but the intensity of water use remains higher than the OECD Europe average. Similarly, although nitrogen fertiliser use fell by 9% and pesticide use by 24%, they are still higher than the OECD and OECD Europe averages. CO_2 emissions from energy use, which fell during the 1980s, increased by 1% between 1990 and 2002, though they are still among the lowest in the OECD. Municipal waste generation increased by 5%.

Overall, France succeeded in *decoupling many environmental pressures from economic growth*. The best results concerned emissions of the main air pollutants (e.g. SO_x and NO_x), freshwater extraction and pesticide use. Growth in the use of nitrogen-enriched organic fertiliser, which had increased up to the early 1990s, has also levelled off, a result due principally to the Programme to Control Pollution of Agricultural Origin (PMPOA), in which about 60% of manure is controlled through

Box 5.1 **Economic context**

France, with GDP of EUR 1 548 billion in 2003, is the *world's fourth largest economy*. It is an integral part of the EU economy. The service sector accounts for 70% of GDP, agriculture for less than 4% and manufacturing for about 25%. GDP grew by 2% a year on average between 1990 and 2003. Recession in the early 1990s was followed by strong growth late in the decade. Activity has slowed since 2001 in line with the broader international context. The French economy grew by only 0.14% in 2003, but the figure for 2004 could be around 2% (Figure 5.1).

Foreign trade accounts for 27% of GDP; of that, trade with other EU countries represents 60%. France's trade balance, negative in the early 1990s, has improved and was substantially in surplus by the late 1990s. The balance of payments is positive. France is the world's leading tourist destination in terms of international arrivals. Its biggest import item is energy, far ahead of consumer goods.

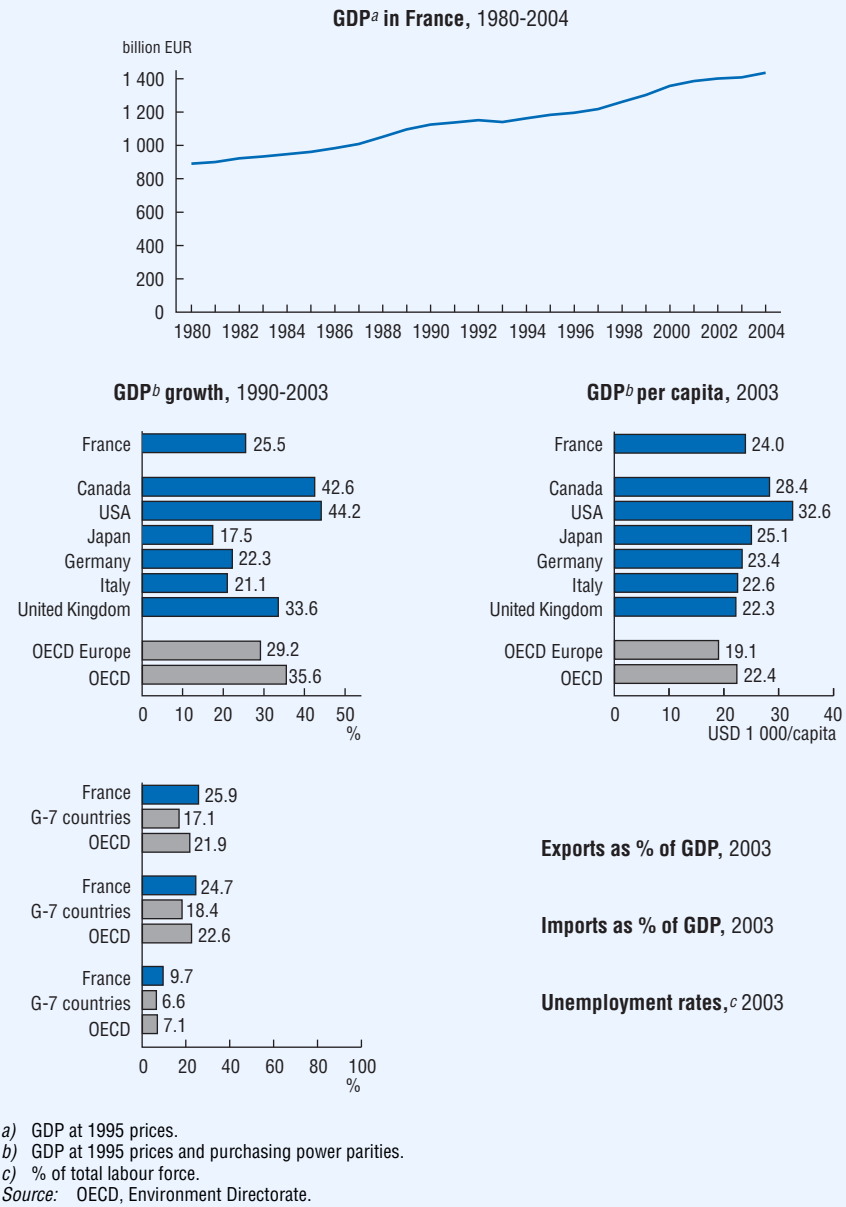
France is a *high-tax* country: taxes and social welfare charges represent 45% of GDP. Social expenditure (covering health care, unemployment, retirement and family support) accounts for 28% of GDP. Public expenditure by all government levels, excluding social expenditure, accounts for 17% of GDP. The *public sector deficit* has fallen sharply and steadily since the early 1990s as a result of rate rises on social charges and limits on public spending. The *net borrowing requirement* rose in 2002 and 2003, however, causing the European Commission to engage in an excessive deficit procedure. Public sector debt measured by the Maastricht criterion amounted to 61% of GDP in late 2003, lower than the EU and OECD averages.

France is the second largest net contributor to the *EU budget*, contributing EUR 14.6 billion in 2002 and receiving 11.8 billion, of which farming accounted for 83% and structural action for 11%. *Foreign direct investment* in France represented 2.6% of GDP in 2003 (USD 45 billion, putting France in second place among the G7 countries).

storage. Despite this progress, growth in *municipal waste* generation and, above all, in *goods transport by road* remains cause for concern. Road is still the dominant mode for domestic goods transport because rail transport is less flexible and the price of road transport has fallen.

The decoupling achieved does not stem from economic choices aimed at bringing about particular degrees of decoupling, nor are environmental objectives generally explicit. *Thought should be given to the economic processes underlying decoupling*. Environmental policy objectives should be clearly stated in the context of marginal costs and benefits (e.g. level of externalities, cost-effectiveness of possible solutions) associated with achieving the objectives. Such analysis would highlight the environmental and economic implications of various development options.

Figure 5.1 **Economic structure and trends**



a) GDP at 1995 prices.
b) GDP at 1995 prices and purchasing power parities.
c) % of total labour force.
Source: OECD, Environment Directorate.

Table 5.1 **Economic indicators and environmental pressures**

(% change)

	1980-90	1990-2003
Selected economic indicators:		
GDP[a]	26	26
Population	5	5
GDP[a] per capita	20	19
Agricultural production	4	–2
Industrial production[b]	14	13
Total primary energy supply	17	20
Energy intensity (per unit of GDP)	–7	–5
Total final consumption of energy	2	15[c]
Road freight traffic[d]	17	34
Road passenger traffic[e]	34	26
Selected environmental pressures:		
CO_2 emissions from energy use[f]	–23	1[c]
SO_x emissions[g]	–59	–59
NO_x emissions[g]	–6	–32
Water withdrawals	22	1[h]
Nitrogenous fertiliser use	16	–9[c]
Pesticide use	19	–24
Municipal waste	21	5[i]

a) At 1995 prices and purchasing power parities.
b) Includes mining and quarrying, manufacturing, gas, electricity and water.
c) To 2002.
d) Values expressed in tonne-kilometres
e) Values expressed in vehicle-kilometres.
f) Excluding marine and aviation bunkers.
g) 2003: preliminary estimates.
h) 1994-2002: total without agriculture.
i) 1989-2002.
Source: CITEPA; FAO; IEA-OECD; OECD.

1.2 Sustainable development: institutions and strategy

Institutional aspects

The *Interministerial Committee for Sustainable Development* was formed in 2003 under the aegis of the Prime Minister to succeed and replace the Interministerial Committee for the Environment, the Interministerial Commission on Climate Change

and the Interministerial Committee for the Prevention of Major Natural Risks. It draws up guidelines for government policy to promote sustainable development and endorses the *national strategy for sustainable development*, whose implementation it tracks and evaluates. It is backed by a standing committee, comprising representatives of every ministry, whose aim is to increase sectoral integration.

Significant changes took place in the institutional structure for environment policy in France between 1996 and 2004. Many of the changes are designed to improve the extent to which economic and environmental considerations are integrated into policy. First, in 2002 the *Ministry of Ecology and Sustainable Development* (MEDD) replaced the Ministry of the Environment established in 1971. MEDD's mandates include assuring policy consistency, environmental effectiveness, economic efficiency, the use of integrative approaches for environmental management and improved public information and consultation procedures. Second, a position of Interministerial *Delegate* for Sustainable Development was created. Third, in 2004 the National Assembly and Senate adopted a new *Environmental Charter* (Box 5.2), which was incorporated into the preamble of the Constitution in 2005 alongside human rights and economic and social rights. It clearly emphasises sustainable development and the need to integrate environmental, economic and social policy goals.

Several important legislative initiatives relating to environmental-economic integration were taken between 1997 and 2004. All of France's environmental legislation was gathered into an *Environment Code* issued in 2000. The *Law on New Economic Regulations* (2001) requires listed companies to include in their annual reports information about how they deal with the environmental and social consequences of their activities. The *Law on the Prevention of Technological and Natural Risks and Repair of Damage* (2003) includes provisions on furnishing timely information to the public on various forms of risk, in the interest of transparency.

New instruments introduced in 2004 will help strengthen *government action in favour of sustainable development*, the aim being to have the state set an example. Ministries must report annually on their water and energy consumption and waste management. Public procurement contracts can now include sustainable development criteria. Possibilities for private-public partnership contracts have been extended and delegated management is encouraged. Under the new Institutional Law on Budget Acts, ministerial budgets are now to be result-oriented, including where sustainable development is concerned.

Sustainable development strategy

The *national sustainable development strategy* was approved in 2003. Its chief aim is improving economic, environmental and social policy integration. It focuses on the

Box 5.2 **Environmental Charter**

The Environmental Charter was approved by both chambers of the Parliament in 2004 and incorporated into the Preamble to the French Constitution in 2005, alongside human rights and economic and social rights. It is the most detailed *constitutional text* relating to the environment among EU countries. The text of the Charter is as follows:

– The French people, considering,

That natural resources and natural balances conditioned the emergence of humankind;

That the future and the very existence of humanity are inseparable from its natural environment;

That the environment is the common heritage of human beings;

That humanity has a growing influence on living conditions and its own evolution;

That biological diversity, personal fulfilment and the progress of human societies are affected by certain consumption and production patterns and by overexploitation of natural resources;

That preservation of the environment should be sought in the same way as the other fundamental interests of the nation;

That to assure sustainable development, the choices made to meet present needs should not compromise the capacity of future generations and other peoples to meet their own needs;

- Proclaim:

Article 1. Everyone has the *right* to live in a balanced and healthy environment.

Article 2. Every person has a *duty* to take part in the preservation and improvement of the environment.

Article 3. Every person must, under conditions defined by law, *prevent* the harm they may cause to the environment or, failing that, limit the consequences.

Article 4. Every person must help *repair the harm* he or she causes to the environment, under conditions defined by law.

Article 5. When an occurrence of damage, even if uncertain given current scientific knowledge, could entail serious and irreversible harm to the environment, the public authorities, by application of the *precautionary principle* and within the scope of their powers, shall ensure that risk assessment procedures are carried out and that temporary and proportionate measures are taken to forestall occurrence of the damage.

Article 6. Public policies must promote *sustainable development*. To that end, they shall reconcile protection and enhancement of the environment, economic development and social progress.

Box 5.2 **Environmental Charter** *(cont.)*

Article 7. Every person has the right, under conditions and within limits defined by law, to *access to information* about the environment held by the public authorities and to take part in the preparation of public decisions that have an impact on the environment.

Article 8. Education and training in environmental matters must contribute to the exercise of the rights and duties defined by this Charter.

Article 9. Research and innovation must contribute to the preservation and enhancement of the environment.

Article 10. France's *action in Europe and in the international arena* shall be based on this Charter.

three economic sectors that the 1997 OECD review identified as priorities: agriculture, transport and energy. The Interministerial Committee for Sustainable Development, reporting directly to the Prime Minister, was formed to guide implementation of the strategy. As of 1 December 2004, 488 measures in this regard had been identified, of which 17% had been completed, 53% were in progress and 30% remained to be implemented. France has also initiated a peer review of its strategy.

Some problems remain, however. While the *national strategy* represents an important step towards environmental-economic integration, it does not go far enough. Better analysis is needed on certain strategic issues, including urban sprawl, long-term trends in energy prices and taxation, and priorities regarding a precise, scientific knowledge base. Too much importance is placed on financial aid to drive change and not enough on the potential role of fiscal instruments. When tax reforms have been proposed, they have not always been fully implemented, as with the general tax on polluting activities (TGAP) (Box 5.3). Not enough consideration is given to the complementary role *economic analysis* can play in determining how ambitious environmental objectives should be. The objectives themselves often remain imprecise, even though sustainable development *indicators* have been developed separately. In realising objectives, too much emphasis is placed on the role of *government intervention* and not enough on investment and consumption. *Redistributive effects* are considered above all from the standpoint of fairness in a north-south context and not enough from the standpoint of particular sectors (e.g. agriculture) or economic agents (e.g. households). Thus, *the economic dimension should be integrated more explicitly into the national strategy* by focusing more on political economy and such

Box 5.3 General tax on polluting activities (TGAP)

The TGAP was introduced in 1999 to induce greater consideration of the environmental costs of pollution in economic decision making and to reduce the earmarking of tax revenue. This single tax, overseen by the Ministry of the Economy, Finance and Industry (MINEFI), *combines five previous pollution charges* (on industrial waste, household waste, air pollution, noise pollution and used oil) whose revenue was allocated to the Agency for Environment and Energy Management (ADEME). The tax is proportional to the quantity of pollutant concerned.

The TGAP was extended in 2000 to cover phosphates, pesticides, gravel and classified installations. Its revenue now accrues to FOREC, the Fund to Finance Reform of Social Charges, which finances reductions in employers' social payments, especially those granted in connection with a reduction in the workweek.

Revenue from the TGAP fluctuated over 2001-04 around EUR 500-640 million (it was EUR 510 million in 2004). Other taxes coming under TGAP coverage have been considered, including on nitrates, radioactive and thermal pollution, energy use and infrastructure that increases flood risk, but none have been introduced to date.

Experience with the TGAP illustrates the problems that can arise if an *integrated approach* is not taken. To simplify, environmental campaigners were reluctant to see revenue from the tax used to finance social programmes (they would have preferred it to be used to environmental ends); those for whom social issues were a priority did not wish to find themselves dependent on potentially ephemeral revenue linked to the environment; financial experts did not like the principle of earmarking tax revenue; and users were hostile to the idea of paying any tax at all, even a "green" one.

microeconomic aspects as distributive effects and the impact on competitiveness; the costs and benefits of proposed measures (e.g. concerning risks or subsidies) should be made clear; and a debate should be initiated to review economic and environmental issues in an interministerial framework.

Environmental-economic integration is also stronger at national level than at *subnational level*. Regional and local authorities and elected officials often focus on planning and the management of financial aid rather than on integration as such. Little consideration is given to environmental objectives, ways to minimise the costs of environmental programmes, or those programmes' contributions to local development (e.g. protection of coasts and the mountains as bases for developing tourism and associated jobs). As local authorities in France play a very important part in environmental policy and natural resource management, the relative lack of interest in environmental-economic integration at local level is cause for considerable concern.

Subnational action is therefore a priority. The national strategy includes a *five-year objective of producing 500 Agenda 21 action plans*, an initiative backed up by local action contracts for the environment and energy efficiency that include organisational and financial assistance for selected rural areas, communities, regional nature parks and other activities at subnational level. In 2005 the government will offer climate change workshops, prepared with local authority associations in 2004, to discuss the implementation of national objectives at subnational level and local authority participation in greenhouse gas (GHG) emission trading.

Economic and environmental assessments

The 1997 OECD Environmental Performance Review recommended *strengthening mechanisms* for: i) economic assessment of environmental policies; and ii) environmental assessment of plans, programmes and projects, including better integration of environmental costs into sectoral planning and territorial management. Much progress has been made in these areas.

Three *new institutions* responsible for improving environmental-economic integration have been established: the National Commission for Public Debate (1997), the Commission for Environmental Accounting and Economics (1998) and the Interministerial Committee for the Prevention of Major Natural Risks (2001). In the late 1990s a *Department of Economic Studies and Environmental Assessment* was set up within the Ministry of the Environment (now MEDD), with special responsibility for assessing the environmental consequences of government economic decisions and conducting an economic review of environmental policies and actions. France also regularly examines the *consistency of government policies* through instruments and institutions such as parliamentary reports, the Council for Economic Analysis, the Court of Accounts (auditors) and the Planning Commission.

Public debates have been held, for instance on energy and water issues. The *national health and environment plan* (2004) is a model document based on a comprehensive review of knowledge, facts and data and on wide-ranging consultation. It is regularly monitored by a steering committee, using indicators and other tools (Chapter 6). Since 2001, the protection system for *Natura 2000* sites has included environmental assessment of activities liable to affect such sites. Substantial progress has been made in local *risk prevention planning* as regards both technological and natural risks.

Overall, progress has also been made on *public consultation* and public involvement in *environmental impact assessments* (EIAs) of capital projects. The new EU *strategic environmental assessment (SEA) directive*, which came into effect in 2004, will help target ex ante strategic assessments, for example in the transport

sector. The directive should be transposed into French law within three years. Integration of environmental considerations through EIA and SEA is less advanced at regional and département level and in *urban planning* than at national and EU level, however. Similarly, although scientific and technical aspects of expected environmental effects are generally well covered, the assessments tend to overlook *socio-economic aspects*.

1.3 Market-based integration

Energy and transport taxes

Existing environmental taxes, such as the *taxes on energy products* (revenue of EUR 25 billion) and *transport taxes* (about EUR 2 billion) (Table 5.2), were generally introduced for fiscal reasons not directly related to environmental externalities, such as CO_2 emissions that contribute to the greenhouse effect (Chapter 7), arising from the sectors' activities. For example, coal is not taxed and thus is indirectly subsidised even though it is the most polluting fuel.

Transport taxes declined by 35% during the review period, mainly because the annual road tax was abolished, while fuel taxes rose by only 5%. These changes, combined with an earlier reduction in VAT on car purchases from 33% to 22%, mean there has been a considerable long-term reduction in *taxation of car ownership* that has not been offset by *taxation of car use*. Fuel taxes are higher in France than in

Table 5.2 **Energy and transport taxes,** 2001

	Type	Beneficiary	Total (EUR million)
Energy	Excise duty on fuels (domestic tax on oil products, TIPP)	Central govt.	23 172
	Domestic consumption tax on natural gas	Central govt.	118
	VAT on oil products	Central govt. (IFP)[a]	195
	Local electricity tax	Municipality (2/3) Département (1/3)	1 235
Transport	Tax on vehicle registration	Region	1 413
	Annual road tax	Département	249
	Axle tax	Central govt.	226

a) Institut français du pétrole.
Source: IFEN.

North America but lower than in some EU countries, including Germany, Italy and the UK. Nevertheless, urban parking fees and motorway tolls help internalise some of the externalities of road transport. Such measures could be reinforced by congestion charges in major cities. It is unfortunate that the government has reduced its financial support for urban public transport, even given the transport charge paid by companies that thus have access to labour in the areas served. The rate of taxes on energy products and transport should be linked to the environmental harm they cause.

The tax differential between *diesel fuel and petrol* has led to a considerable increase in the proportion of diesel vehicles on the road, with some negative environmental effects. In 1998 the government pledged to reduce the difference to the EU average within seven years, but halted the process in 2000 before resuming it in 2004 with a tax increase of EUR 0.03 per litre. Steps to eliminate the difference between diesel and petrol should be continued and extended to heavy goods vehicles, despite the notable improvement in modern diesel vehicles' particulate emissions and the environmental benefit of diesel fuel (the engines emit less CO_2 than petrol engines, but also more NO_x).

A *planned carbon/energy tax* on companies' intermediate energy consumption, in the framework of the TGAP, was apparently intended to have an incentive effect. The tax, whose revenue would have gone to reduce companies' social welfare charges, was also supposed to contribute significantly to the plan to reduce GHG emissions and help achieve French objectives under the Kyoto Protocol. The Constitutional Council rejected the plan in December 2000 as non-egalitarian in conception. The government then sought alternative solutions, such as negotiating voluntary agreements to reduce GHG emissions (Chapter 8).

All aspects of taxation of environmentally harmful energy products need to be reformed, as do various tax exemptions or reductions, especially those granted to road and air carriers. It would be desirable to set up a *green tax commission* under the aegis of the Prime Minister in order to prepare such a reform, as has been done in other OECD countries.

Farm subsidies

Direct farm subsidies (i.e. not counting price support) accounted for some 60% of farm income in France in 1997. Farming was also one of the main beneficiaries of water subsidies, especially for irrigation. Between the 1960s and mid-1990s the amount of irrigated land more than quadrupled under the combined effect of undercharging for water and subsidising irrigation investment. Water users pay considerably less in agriculture than in other sectors; the withdrawal charge for farms is roughly one-fifteenth of what households pay, for instance. Irrigation is also

subsidised (up to 65%), through direct support to develop water supplies and EU aid linked to irrigated land. Moreover, certain cross-subsidies, such as reduced fuel taxes, indirectly benefit agricultural production.

Developments in the World Trade Organization and EU in recent years have led to a *gradual reduction in farm subsidies*. Structural changes to EU subsidy programmes have also shifted support away from production-based payments to aid with beneficial long-term environmental effects. Improved access to markets and lower export subsidies are other positive steps in the right direction.

EU subsidy reform has included *agri-environmental measures*. In France, such transfers, through sustainable farming contracts, totalled some EUR 1.6 billion over 2000-03, or almost one-third of expenditure budgeted in the national rural development plan. Added to that is financial aid in national programmes addressing particular environmental problems. Some of these programmes, such as *PMPOA* and programmes to help farmers switch to more environment-friendly production methods, have resulted in observable environmental improvements. *Territorial farming contracts*, and the sustainable farming contracts that followed them, have encouraged conversion to organic farming.

Nevertheless, some of these support programmes continue to pose problems of environmental-economic integration. Some, by offering financial incentives to reduce pressure on the environment, are *inconsistent with the polluter pays principle*. The PMPOA is an example. In "structural surplus areas" for nitrogen, mostly in Brittany, livestock farms that exceed a certain size and have less than the recommended surface area for nitrogen spreading can qualify through this programme for investment subsidies for manure and slurry storage. The polluter pays principle has been partly restored, however, for the biggest farms (over 90 livestock units), which since 1996 have had to pay the Water Agencies a pollution charge. Like factories, farms able to prove that their practices and investment reduce pollution pay a reduced charge. Other measures *increase the pollution risk*. Direct irrigation subsidies, for instance, lead to increased water consumption and more intensive use of fertiliser and pesticides because of the need for high yields. Such subsidies are now subject to eco-conditionality rules (making aid conditional on environmental improvement). Other measures *increase the pressure on fragile ecosystems*. Natural disadvantage compensation payments, for instance, help keep low-productivity mountain areas as pasture. Here too, elements of eco-conditionality have been introduced: the load factor must be monitored to ensure that the land is not overgrazed. *One programme can also offset the negative environmental effects of another*. Thus, the effects of subsidies to increase irrigation (supplemental payments for irrigated crops) are countered by agri-environmental measures related to irrigation.

The 1997 OECD review recommended that France abolish, as far as possible, *subsidies that are damaging to the environment*. It also recommended cataloguing all environmentally harmful tax measures and amending them appropriately. Some progress has been made in this area with the elimination of coal subsidies and introduction of eco-conditionality in some farm programmes. Recent reforms to the EU's Common Agricultural Policy also move in the direction of decoupling farm subsidies and environmental pressures.

Most decisions concerning subsidy programmes, however, continue to be based on available financial resources rather than expected environmental or economic effects. Hence, it is important to continue reforming *environmentally harmful subsidies*. Measures needed include improving information about such subsidies, improving analysis of their dynamic and long-term effects on the environment and the economy, putting in place adjustment policies and transition measures to gradually introduce the necessary reforms and increasing international co-ordination to minimise effects on competitiveness. More generally, support programmes of all types (economic subsidies with environmental effects, payments with direct environmental objectives, eco-conditionality measures) should be examined from the standpoint of their net impact on environmental effectiveness and economic efficiency.

1.4 Sectoral and institutional integration

Integration in the energy and transport sectors

In 2003 the government organised a *national debate* on energy policy. Government action relating to the environment and energy focuses mainly on improving energy efficiency and increasing the share of renewable energy sources in the energy supply. For example, the government aims to increase the share of renewables from 12% of electricity consumption now (hydroelectric power accounts for 11%) to 21% by 2010. It also promotes natural gas and nuclear power, regarded as less polluting than other solutions. Moreover, the government is continuing to liberalise the energy market, which should improve environmental-economic integration in the long term (Chapter 7).

Several programmes have been introduced to help meet the goals on *energy efficiency* and *renewables*. For example, ADEME has established partnerships with several industry federations with the aim of improving energy efficiency in major energy-consuming sectors. It also offers special deductions for depreciation on energy-saving investments and various types of aid for the development and use of renewable energy sources.

France aims to stabilise its GHG emissions at their 1990 levels by 2010. To that end, it adopted the *National Programme to Combat Climate Change* in 2000 and a further Climate Plan in 2004. The energy sector has been asked to play a major role in achieving the objective. Targets for the sector have been defined and a long-term emission reduction objective has been set (–75% by 2050). Institutionally, *MEDD* plays an active part in framing France's energy policy and contributes to better environmental-economic integration.

To take better account of environmental concerns in *road planning and building*, the ministries dealing with public works and environment signed a protocol in 1999 and issued a circular for consultation among the Regional Environment Directorates and decentralised agencies dealing with infrastructure. The quality and influence of *EIAs* for road projects have improved as a result. *Cost-benefit analysis*, particularly as regards environmental externalities, is frequently done before major transport decisions are taken.

Integration in the agriculture sector

The 1997 review recommended a more integrated approach in agriculture, and progress has been made. *Territorial farming contracts* and the more recent *sustainable farming contracts* contain provisions explicitly encouraging more integrated management methods. Current approaches favour agri-environmental programmes and eco-conditionality criteria. Progress was made in 2003 in tightening regulation of water withdrawals for agricultural use and implementing a new plan to *reduce pollution from pesticides*.

Despite these efforts, nitrate pollution remains a serious problem in some areas. Implementation of the relevant EU directive is lagging, mainly because of the costs involved (especially for local authorities). The pollution problem arises because the agriculture sector is not required to *internalise the environmental costs* it generates. A recent Planning Commissariat study concluded that environmental externalities play only a tiny role in deliberations by agricultural policy makers despite the scale of farming's environmental impact.

1.5 Environmental expenditure and competitiveness

Expenditure

Environmental protection expenditure in 2002 totalled *EUR 28.8 billion, or 1.9% of GDP*. The public sector spent 65% of this total, businesses 29% and households 6% (Table 5.3), while in terms of funding sources the public sector accounted for 29%, business for 43% and households for 28%. Water and waste are the biggest items.

Environmental protection expenditure has increased steadily as a proportion of GDP, from 1.73% in 1996 to 1.9% in 2002, and even more in volume. Investment has provided the main growth in recent years, with the relative share of operating expenditure declining accordingly. Much of the investment is made by local authorities for water treatment and waste management. Investment's share of the total in 2002 amounted to EUR 7.7 billion, or 2.6% of gross fixed capital formation.

Environmental management expenditure (i.e. the environmental protection expenditure discussed above plus spending on water supply, recycling/recovery and quality of life) amounted to *EUR 43 billion in 2002, or 2.8% of GDP* (Table 5.3). The

Table 5.3 **Environmental management expenditure,** 2002

(EUR million)

	Public sector[a]	Private sector	Households	Total	GDP (%)
A. ENVIRONMENTAL PROTECTION EXPENDITURE[b]	8 218	12 518	8 078	28 814	*1.9*
Sewerage and waste water treatment	3 000	4 163	4 019	11 182	
Air	75	1 396	139	1 610	
Noise	131	430	315	876	
Waste	1 399	5 740	3 559	10 697	
Subtotal pollution[c]	4 392	11 729	8 032	23 489	*1.55*
Street cleaning	1 078	. .	. .	1 078	
Nature	438	424	47	862	
Research and development	722	365	–	1 087	
General administration	1 377	. .	–	1 377	
B. OTHER ENVIRONMENTAL EXPENDITURE					
Quality of life	1 735	. .	. .	1 735	
Drinking water supply	1 494	2 232	3 554	7 280	
Recycling/recovery	. .	4 743	. .	4 743	
Total (A + B)[d]	11 447	19 492	11 632	42 572	*2.8*

a) Central government, regional authorities, départements and local authorities, consortia of municipalities and specialist agencies (includes revenue from charges).
b) Environmental protection expenditure, including pollution abatement and control expenditure (presented by economic sector). Rose from 1.43% of GDP in 1990 to 1.73% in 1996 and 1.90% in 2002. Investment amounts to EUR 7.7 billion or 2.6% of gross fixed capital formation.
c) Expenditure on pollution abatement and control (presented by economic sector).
d) Environmental management expenditure, of which EUR 10 billion (3.4% of gross fixed capital formation) is investment.
Source: MEDD, 2003.

Water Agencies and départements are the main sources of funds, along with users paying for services. Investment amounted to some EUR 10 billion in 2002, or 3.4% of gross fixed capital formation.

Competitiveness

The implementation of environmental policy *does not seem to have posed any real problem regarding competitiveness* in France so far. In practice, even business leaders see competitiveness issues as generally being linked not to environmental policies but rather to other variables, such as the euro-dollar exchange rate, labour costs and proximity to markets. Indeed, strict environmental regulation can generate an advance in technology or profit potential that translates into a strategic competitive advantage. For example, French firms lead the world in the water sector. More generally, big companies are aware of the need to play an active part in promoting environmental protection and sustainable development. Many of them have taken significant steps towards integrating these needs into their day-to-day activities in France and abroad, through instruments such as environmental management systems, environment reports, international initiatives and voluntary partnerships such as Type II (Johannesburg) projects.

In theory, higher production costs can mean fewer exports and more imports and can displace investment towards less highly regulated countries. Concern may exist in some firms or sectors that particular regulations or approaches will seriously undermine competitiveness. This issue is perhaps most sensitive where *risk prevention* is concerned. Such concern explains why making the precautionary principle part of the Constitution was so hotly debated even though the principle was already enshrined in legislation.

In the future, problems with competitiveness could arise if a more ambitious line were taken in certain areas of environmental policy, such as stiffer measures to reduce GHG emissions or higher costs resulting from implementation of EU water directives.

2. Environmental Management

2.1 Institutional framework

Environmental administration at national level

France's first environment ministry was established in 1971. Today *MEDD* deals with policy on water, air, waste and nature. In 2004 its budget totalled EUR 860 million and its staff numbered 3 600, a 50% increase since 1997. MEDD has decentralised local directorates, the DIREN and DRIRE (Box 5.4), and supervises

Box 5.4 **Decentralised agencies of MEDD**

Regional directorates

MEDD has *26 Regional Environment Directorates* (DIREN). Established in 1991, they employ 1 500 people. Operating under the authority of the regional prefect, they develop knowledge of natural spaces, ensure that environmental considerations are taken into account in development projects and in local and national planning documents, and ensure that laws relating to nature, natural sites and landscapes are enforced. They provide information and raise public awareness about environmental issues. The DIREN help to prepare and implement planning contracts between the central and regional governments, apply EU structural funds, and prepare water use and management plans, local zoning plans and charters for regional nature parks and areas adjacent to national parks. They co-ordinate the preparation of major natural risk prevention plans.

Each of the *24 Regional Directorates of Industry, Research and the Environment* (DRIRE) has had an industrial environment unit since 1992. MEDD's budget includes 1 100 DRIRE posts. The DRIRE, under the authority of the prefect, enforce legislation relating to classified installations, air pollution and waste, and are responsible for prevention of major technological risks. DRIRE inspectors are responsible for controlling 450 000 classified installations (the veterinary services inspect 21 000 livestock farms and abattoirs). Of these, 65 000 must be licensed by the prefect, 10 000 present major risks and 1 250 are covered by the Seveso directive.

Other regional administrative bodies

One role of regional prefects is to co-ordinate government policy, especially environment policy, in their regions. They can consult specialist bodies bringing together all stakeholders concerned, such as the River Basin Committees, Mountain Committees for major mountain ranges, and regional forest and forestry product commissions.

The regions have powers to promote economic, social, health, cultural and scientific development and land use planning, in partnership with the central government, within the framework of central-regional planning contracts. Sustainable development is a priority for 2000-06. In the 1990s (for the most part), 11 regions set up administrative environmental management frameworks. The regions help prepare national, regional and departmental plans, such as regional hazardous industrial waste disposal plans, regional air quality plans, regional land use plans, public service plans and the central-regional planning contracts.

several other agencies (Box 5.5). The Environmental General Inspection Service is devoted full time to enforcement, assessment and advice concerning environmental policy implementation.

Box 5.5 **Services overseen by MEDD**

MEDD is responsible for supervising the six *Water Agencies*, which cover the major hydrographic basins; seven *national parks;* and other public establishments:

- the *National Institute of Industrial Environment and Risk*;
- the *Higher Council on Fisheries*, whose main tasks are enforcing fishing legislation and providing support to department federations of fishing associations;
- *the National Hunting and Wildlife Office*, which acts as a technical adviser to the ministry and helps to enforce the laws on hunting;
- the *Conservatory of Coastal and Lakeshore Areas* (CELRL), responsible for acquiring and preserving threatened sites.

MEDD is *jointly responsible* for supervising seven other public establishments:

- the *ADEME*, with the ministries responsible for research and energy. ADEME and its 26 regional delegations undertake research, provide technical advice, raise awareness and provide financial incentives relating to energy management and the use of raw materials, the development of renewable energy sources, waste disposal and recycling/recovery, air and soil pollution, and the development of clean and quiet technologies;
- the *French Environmental Health Safety Agency*, with the ministry responsible for health;
- the *Institute for Radiological Protection and Nuclear Safety*, with the ministries responsible for defence, industry, research and health;
- the *National Radioactive Waste Management Agency*, with MINEF;
- the *National Forestry Office* (ONF), responsible for managing state forests, with MAAPR;
- the *National Natural History Museum*, with the ministry responsible for research;
- the *French geological survey*, BRGM, with the ministry responsible for research.

The French Environment Institute (IFEN), which compiles and publishes statistics on all aspects of the environment, is no longer a public establishment. In 2005 it became a national agency reporting to the minister in the same way as other statistical units.

Other ministries that play an important part in protecting the environment are the Ministry of Agriculture, Food, Fisheries and Rural Affairs (MAAPR), MINEFI, the Ministry of Capital Works, Transport, Housing, Tourism and the Sea, the Ministry-Delegate of Research and New Technologies and the Ministry of Justice.

MEDD participates fully in the environmental protection aspects of policy decisions relating to transport infrastructure, urban planning, countryside and forest development, the use of energy resources and health. It polices quarrying and is responsible for the protection of landscapes, sites, the shoreline and mountains. With MINEFI it is also responsible for framing and implementing nuclear safety policy. It can draw on many resources from other ministries in carrying out its duties, such as agencies relating to energy, forests and urban planning. In addition, the minister can call on 22 national boards and committees, some of them interministerial. The *Secretariat-General of the Interministerial Committee* is responsible for interministerial co-ordination, especially on EU economic co-operation issues.

Administration at département level

The département is the main level at which national policies are implemented, through the *local agencies of the various ministries*. The main ones concerned with the environment are the département directorates for infrastructure, for agriculture and forestry and for health and social affairs. Département hygiene commissions, chaired by the prefect, have an advisory role in all matters relating to public health and the environment, such as classified installation licence applications, drinking water supply points, drilling and health hazards. The commissions draw their membership from government agencies, local authorities, environmental NGOs, professional bodies and suitably qualified individuals. *Département prefects* have considerable authority in environmental matters through their powers of regulation and co-ordination.

The *départements* set up technical and financial assistance programmes for rural communities, for water and electricity supplies and for sewage treatment. They have delegated powers to develop, maintain and exploit public watercourses, canals, lakes and reservoirs and can draw up departmental plans for the disposal of household and similar waste. They are responsible for non-urban transport and for implementing the policy of protecting sensitive natural areas.

Municipal responsibilities

Municipalities have *planning* responsibilities through local zoning plans and territorial cohesion plans, and they issue building permits. They also manage municipal parks and gardens and urban transport (via urban mobility plans). The *mayor's general police powers* form the basis for municipal jurisdiction regarding pollution and nuisances (e.g. waste removal, public health matters, bill-posting and noise pollution control). Municipalities are responsible for *water supply and sewage networks* and the *collection, treatment and disposal of household and similar waste*. Many municipalities set up *intercommunal* groups, with their own budgets, to manage public services, such as water and waste services. Such groups provided services to 82% of the population in 2004.

2.2 Legislative and regulatory context

General legislation

Since 2000 all French environmental legislation has been brought together in the *Environment Code* (Box 5.6). Article 1 of the 1995 Law on Enhanced Environmental Protection incorporated the key principles of international environment law into French law: the *precautionary principle*, the *rectification at source principle* for environmental damage, the *polluter pays principle* and the public *participation principle*. The *Environmental Charter* has been adopted by the Parliament and incorporated into the Constitution (Box 5.2). There was heated argument about incorporating the precautionary principle into a constitutional text.

As France has played an active part in *developing EU approaches* to environmental matters, French environmental law has both influenced EU directives (such as the IPPC and Water Framework Directives) and been influenced by them. Today some 70% of French environmental legislation is of EU origin. Transposing directives into national law is not entirely straightforward: a European Commission report has identified 38 shortcomings on France's part. The directives on nitrates, urban waste water, habitats and birds have posed particular problems.

The *devolution* laws of 1982-83, the 2003 law on local democracy and the constitutional reform the same year, and the 2000 Law on Urban Solidarity and Renewal (SRU) spell out the division of powers among the various levels of government and influence land use planning. The 1995 and 1999 framework laws on regional planning and development introduced nine national strategy documents, called public service plans, which relate to (among other matters) passenger transport, goods transport, energy and natural and rural areas. These plans provide for "perequation" or re-equalisation in local finances to limit disparities among local jurisdictions. The Urban Planning Code contains rules for *building permits* and puts integration of sustainable development objectives at the heart of *local planning* instruments such as territorial cohesion plans, local zoning plans and mixed-development zones. Local zoning plans constitute public utility easements. Strengthened requirements in these plans mainly derive from the 2000 SRU law.

Sector-specific legislation

Environmental risk is a French policy priority (Box 5.7, Table 5.4). Successive laws have asserted the government's responsibility for organising risk monitoring and prevention and the provision of information. The laws define the organisation of emergency services and rules for payment of compensation from a special fund, and

Box 5.6 **Main environmental legislation**

1917 Law on Dangerous, Unsanitary or Injurious Enterprises
1930 Law on the Conservation of Natural Sites and Monuments
1960 Law on the Creation of National Parks
1961 Law on the Control of Atmospheric Pollution and Odours
1964 Water Law
1964 Hunting Law
1972 Law on the Development of Mountain Areas for Grazing Livestock
1975 Law on Waste Disposal and Recovery of Materials
1976 Law on Classified Installations
1976 Nature Protection Law
1977 Law on the Control of Chemical Products
1983 Law on Wider Participation in Public Enquiries and Environmental Protection
1984 Fishing Law
1985 Law on the Development and Protection of Mountain Areas
1986 Law on Coastal Development, Protection and Enhancement
1987 Major Risks Law
1992 Law on Biotechnology
1992 Law on Noise Abatement
1992 Water Law
1992 Law on Waste Disposal and Classified Installations
1993 Law on Quarries
1993 Law on Landscape Protection and Enhancement
1995 Law on Enhanced Environmental Protection
1995 Framework Law on Regional Land Use and Development
1996 Law on Air and Energy Efficiency
1996 Law on the Development, Protection and Enhancement of the "50-Pace" Zone in Overseas Départements
1997 Framework Law on Sea Fishing and Marine Aquaculture
1999 Framework Law on Regional Land Use and Sustainable Development (amending the 1995 law)
1999 Framework Law on Agriculture
2000 Environment Code
2000 Hunting Law
2000 Law on Urban Solidarity and Renewal
2001 Law Making Climate Change Control and Prevention of Risks Related to Global Warming a National Priority
2001 Framework Law on Forests
2002 Law on Local Democracy
2003 Law Creating an Ecological Protection Zone off the Coast of the Republic
2003 Law on Urban Planning and Habitats
2003 Hunting Law
2003 Law on the Prevention of Technological and Natural Risks and Repair of Damage
2004 Law on the Transposition of the Water Framework Directive

Box 5.7 **Prevention of natural and technological risks**

Risk prevention has been a *political priority* for several years in response to a series of natural and technological disasters. Insurance companies pay out some EUR 400 million each year to cover damage resulting from natural disasters. Natural and technological risk is included in legislation passed in 1982, 1987, 1995 and 2003. France complies with the EU's 1996 Seveso II directive.

Natural risk prevention

Flooding is the most common natural risk in France (Figure 3.2). The 1995 Law on Enhanced Environmental Protection introduced *natural risk prevention plans* designed to cover all natural risks. Drawn up at municipal level, they are approved by the prefect. Attached to the local zoning plan, they constitute public utility easements. In areas directly or indirectly concerned, they lay down rules for the conditions under which buildings may be erected and used, and may go so far as a total ban on construction. The preparation of natural risk prevention plans is financed by MEDD and the Major Natural Risk Prevention Fund, to which insurance companies are required to contribute. By 2005, 5 000 communes should have such plans; 4 100 others had an approved plan by the end of 2003; and 6 100 plans have been prescribed but not yet approved.

The 2003 law strengthens the arrangements for dealing with natural risks and includes measures to reduce the vulnerability to the risk of flooding in particular. It reasserts the *government's responsibility* for organising monitoring, prevention and information. It also includes measures relating to the provision of information to the public, land use, work sites, financial arrangements and the conditions for intervention by land restoration services and the ONF.

Risk prevention in the *overseas départements* is now regarded as a priority. Réunion, Martinique and Guadeloupe are exposed to particularly major risks, such as flooding, landslides and earthquakes, that are less predictable than in Metropolitan France. They are also exposed to specific risks, such as cyclones and volcanic eruptions. In these three départements 96 municipalities are affected and prevention is insufficient: only Réunion has a risk prevention plan.

To give local authorities and the public better information, the government *flood warning services* have been reorganised. A central hydrometeorological and flood forecasting support service was established in June 2003.

Technological risk prevention

Following the disaster at the AZF chemical plant in Toulouse on 21 September 2001 (Box 2.2), the 2003 law on risk prevention was passed to improve risk prevention and management by getting company managers, employee representatives and outside parties more involved, especially as regards information, consultation, training and evaluation.

Box 5.7 **Prevention of natural and technological risk** *(cont.)*

Through *local information and consultation commissions* at high-risk sites, this law makes it possible to conduct a debate with local residents about acceptance of the risk. The government is required to set up *technological risk prevention plans* around such sites. New measures have also been introduced so that victims not insured for damage caused by technological disasters *can receive compensation*.

Table 5.4 **Natural risks**

Risks	Number of municipalities concerned	
	Metropolitan France	Overseas départements
Flooding	11 604	81
Landslides	5 932	94
Avalanches	6 355	0
Forest fires	11 604	23
Earthquakes	3 905	68
Storms and whirlwinds	73	92
All risks	. .	96

Source: IFEN.

require foreseeable natural risk prevention plans to be drawn up, imposing public utility easement status on the areas concerned. The plans can set urban planning rules. The frequency of natural disasters and industrial accidents led to the 2003 law on *risk prevention*, which, as well as providing for the repair of damage, introduces technological risk prevention plans and compensation funds, and increases the responsibilities of almost 670 enterprises. More generally, the law aims to increase the information available to the public and to strengthen risk prevention mechanisms.

The 1964 *Water Law* contained early examples of the concepts of integrated management at river basin level, a partnership approach and financial incentives based on the polluter pays principle. The 1992 Water Law introduced the concept of ecological planning and management of water resources. Under this law, a water

development and management plan must be drawn up for each river basin, setting targets for the use and protection of water resources, aquatic ecosystems and wetlands. Legislation introduced in 2004 to transpose the EU Water Framework Directive is designed to control diffuse pollution and restore ecological quality. A further law in preparation would strengthen the mechanisms of basin-level management and the application of the user pays and polluter pays principles to leisure activities and agriculture.

The 1976 Law on *Classified Installations* introduced *integrated pollution management* (i.e. for air, water and waste) and application of the polluter pays principle. It takes a holistic approach to the risk, pollution and nuisances that an installation can represent, and refers to the best available techniques not entailing excessive cost. Installations covered by this law must be declared to or licensed by the prefecture, depending on the degree of nuisance involved.

The 1961 Law on the Control of *Atmospheric Pollution* and Odours paved the way for reductions in certain emissions when concentrations become excessive, either temporarily in the context of alert procedures, or permanently within special protection areas. Such areas exist in Paris, Lyon, Marseille, Lille and Strasbourg. The 1996 Law on Air and Energy Efficiency introduced air quality monitoring and regional air quality plans throughout the country. Air protection plans for urban areas of more than 250 000 inhabitants can impose restrictions on traffic and industrial activities. Urban mobility plans are required for cities of over 100 000.

The 1992 Law on *Waste Disposal and Classified Installations*, which replaced the 1975 Law on Waste Disposal and Recovery of Materials, laid the foundations for a policy of waste management at source, waste "valorisation" (encompassing reuse, recycling and energy recovery) and treatment of non-valorised waste, with the aim of ending landfill and storage, except for final waste, by 2002. Major waste generators are required to do waste studies under the Law on Classified Installations. In accordance with the 1992 law, regional industrial waste disposal plans and département plans on municipal and similar waste have been drawn up, covering the whole country.

Concerning *nature conservation*, much legislation has been passed since the 1930 Law on the Conservation of Natural Sites and Monuments, resulting in the creation of national parks, nature reserves, regional nature parks, protected habitat areas and CELRL protected sites. Many orders protecting species and their biotopes have been issued under the 1976 Nature Protection Law. The 1993 Law on Landscape Protection and Enhancement represented a shift from a normative system of protecting designated areas to a nationwide integrated landscape protection approach. The 1986 Law on Coastal Development, Protection and Enhancement aims to

preserve an "unspoilt third", keeping one-third of the coast in a natural state, and bans construction within 100 metres of the shore. In the 1 124 communes concerned, it is also a means of curbing or preventing development in areas defined as remarkable. Legislation creating an ecological protection area off France's coasts, introduced in 2003, allows protection of the Mediterranean coast up to more than 100 km from the shore. An ordinance of 2001 transposed the EU bird and habitat directives to create France's Natura 2000 network.

2.3 Enforcement of environmental legislation

Environmental enforcement is of two types: *administrative procedures* under the authority of the executive and *criminal proceedings* through the court system. Enforcement procedures aim to ensure that laws and regulations are applied, to improve the prevention of environmental damage and to penalize offenders. Environmental enforcement covers water, fishing, hunting, wildlife, sites, parks and reserves and various forms of hazardous pollution or nuisance (classified installations, waste, noise, bill-posting). Criminal proceedings are carried out by special police units and the national gendarmerie, which handle a very large number of violations and offences. Enforcement is decentralised, co-ordinated at département and regional level.

The *amount of administrative and police activity* is increasing. The number of water-related cases processed rose from 14 700 in 1998 to 33 000 in 2002. In wildlife protection, the number of import and export procedures under the Convention on International Trade in Endangered Species of Wild Fauna and Flora rose from 17 500 in 1997 to 30 000 in 2002. Better environmental enforcement is a priority objective of MEDD, but its efforts are impeded by the disparity between the tasks assigned to it and the resources at its disposal for the purpose. Another problem is the very different levels of commitment of prosecutors, who do not always take action when offences are reported. In 2002, out of 278 water-related cases (58% of them involving pollution), 33 were dropped, 205 were settled out of court and 40 were prosecuted. The number of fines and other penalties is *virtually unchanged* over the years. Compared with 1996, there are fewer convictions for criminal offences and serious breaches of environment legislation, fewer convictions for waste-related offences and more convictions for water-related offences.

Classified installation inspections are carried out at the facilities presenting the greatest hazard. Generally speaking, industrial and agricultural facilities liable to pose a hazard or cause pollution must either make a declaration (450 000 installations) or get a licence (64 600 installations). Of the installations subject to licensing, 32 659 are inspected by the DRIRE, which have *the equivalent of 615 full-time inspectors*, and

26 512 by Département Veterinary Service Directorates (with *the equivalent of 202 full-time inspectors*). Inspectors take administrative measures (authorisation orders or supplementary orders), make spot checks, issue notices of required action and impose administrative sanctions. In 2002 facilities were ordered to suspend activities in 150 cases, 37 installations were closed and 418 companies were ordered to set aside funds to carry out required work (Table 5.5). Following the disaster in Toulouse in 2001 (Box 2.2), 150 additional inspector posts were created for classified facilities. Four times as many hazard assessments were processed in 2002 as in 2001.

Table 5.5 **Classified industrial installations**[a]

Number of establishments requiring licences	32 659
of which:	
Establishments governed by the IPPC directive	4 709
Establishments posing major accident hazards	1 148
Seveso lower-threshold establishments	489
Number of inspectors (full-time equivalent)	615
Inspections	10 985
Spot checks of discharges	2 234
Rectification orders	2 549
Administrative penalties (sequestered funds, suspension of activity, etc.)	633
Criminal sanctions (upon offence report)	1 064
Authorisation orders	1 614
Supplementary orders for existing installations	2 705
Hazard studies	196

a) Classified installations visited by DRIRE inspectors in 2002.
Source: MEDD.

2.4 Economic instruments

Current situation

France makes *extensive use of economic instruments* in the form of environmental taxes, charges and various types of financial support: 68 such instruments have been identified, including 48 taxes and charges (Table 5.6). The *energy and transport taxes*, which are the most important in terms of revenue raised (energy taxes, including fuel taxes, raise EUR 25 billion per year and transport taxes EUR 2 billion), were created for purely fiscal purposes (Table 5.2). *Direct environmental taxes and charges* are mostly levied at municipal level. Charges for

services (water supply, sewage and waste disposal) raise EUR 12.5 billion and other charges EUR 3 billion (equivalent to EUR 54 per inhabitant), half of which goes to finance the water sector, generally through municipalities.

The *TGAP*, introduced in 1999, replaced pollution charges on industrial waste, municipal waste, air, noise and used oil (Box 5.3). It was extended in 2000 to cover detergents, pesticides, gravel and classified installations. Its revenue is earmarked for the social welfare system. The effectiveness of the 2000 measure, designed to encourage the use of non-phosphate detergents and limit the use of pesticides, is not reduced by its being earmarked.

In addition to imposition of the TGAP, *charges for services* have increased by over 25% (Table 5.7). Revenue from water charges amounts to some EUR 9 billion and that from waste charges to EUR 3.5 billion. The increases have had a significant effect on waste and water management.

Financial aid is highest in the water sector and mostly finances sewage treatment. Such transfers amounted to EUR 1.19 billion in 2001, representing 43.5% of capital spending on sewage treatment. The amount of aid is falling, however, as businesses receive less support. ADEME grants for municipal and industrial waste management have fallen to about EUR 120 million.

Desirable measures

The use of economic instruments, although extensive, could be improved. Concerning the *instruments whose role is mainly to raise revenue*, an increase in the *rates of charges and taxes* would better cover government agencies' costs (Table 5.8) and improve internalisation of externalities. This is particularly true of pollution taxes and charges. The system of waste management taxes and charges is another example of a financial rather than incentive-based rationale. Concerning *instruments intended mainly to provide incentives* (e.g. "bonus-malus" on car purchases, congestion charging, emission permit trading, measures concerning nature and agriculture) much remains to be done. Measures set forth in the *national health and environment plan* related to emissions from mobile sources could be defined and implemented. Coverage of CO_2 emissions in the TGAP could be reconsidered for activities not covered by emission quotas. The biggest emitters (the energy production, cement, and iron and steel industries) must take part in the EU market for CO_2 emission permits, which started on 1 January 2005. The fuel tax differential between petrol and diesel fuel could continue to narrow. A degree of harmonisation with neighbouring countries' fuel taxes would also be welcome. To prepare such reforms, a *green tax commission* should be set up under the authority of the Prime Minister.

Table 5.6 **Economic instruments**[a]

	Type	Beneficiary	Rate	Revenue 2001[b]
Water	Pollution charge Withdrawal charge (since 1964)	Water Agencies	Based on actual or estimated amount discharged (decided by River Basin Committee)	EUR 1 333 million + EUR 262 million (redistributed to local authorities, industry and farmers)
	Water supply charge	Municipalities	Based on volume	EUR 9 036 million to cover water supply and waste water treatment
	Water tax	Central govt.	Based on volume	EUR 85 million for FNDAE[c] and PMPOA[d]
Phosphate	Pollution tax on detergents (1999)	Central govt.	EUR 72-87/tonne	EUR 84 million (earmarked for social welfare programmes)
			162 taxpayers	Incentive tax
Pesticide	Pollution tax on antiparasite pesticides (1999)	Central govt.		EUR 36 million Incentive tax
Mineral water	Withdrawal charge	Central govt. Municipalities	EUR 0.54/litre EUR 0.58/litre	EUR 20 million Waste water treatment
Air	Charge on emissions of SO_X, NO_X, VOCs and hydrogen chloride from facilities emitting over 150 tonnes a year or with capacity of over 20 MW, or incinerating over 3 tonnes an hour of waste (1985)	Central govt.	EUR 27-57/tonne	EUR 28.4 million
Household waste	Household waste collection tax	Municipalities	Based on property value. Average EUR 65/inh.	EUR 3 090 million
	Household waste collection charge (1926)		Average EUR 46/inh.	EUR 360 million
Campsite household waste	Collection charge (1973)	Municipalities		
Ordinary industrial and commercial waste	Special collection charge (1992)	Municipalities	Based on service provided	EUR 80 million (2002)

Table 5.6 **Economic instruments**[a] *(cont.)*

	Type	Beneficiary	Rate	Revenue 2001[b]
Landfills	Pollution tax on disposal to landfill of household and similar waste (1992)	Central govt.	EUR 9-18/tonne	EUR 227 million (waste management modernisation and contaminated site clean-up fund)
Disposal of special industrial waste	Pollution tax (1995)	Central govt.	EUR 9-18/tonne	EUR 30 million (clean-up of orphan contaminated sites)
Oil	Pollution tax (1999)	Central govt.	Industrial oil: EUR 38/tonne	EUR 27 million (paid to firms collecting waste oil)
Street cleaning	Tax	Municipalities	Based on pavement length	EUR 64 million (2000)
Aircraft noise	Take-off tax, aircraft of over 2 tonnes (1992)	Central govt.	EUR 8-22/tonne	EUR 10 million (2002)
Aggregates	Pollution tax on sand and gravel	Central govt.	EUR 0.09/tonne	EUR 28.6 million (earmarked for social welfare programmes)
Parks and gardens	Département tax on sensitive natural sites	Département	Based on construction	EUR 100.5 million (2000) to buy and safeguard unspoilt areas
Overbuilding	Tax (1975)	Municipalities Département	–	EUR 32 million (2000)
Classified installations	Pollution tax (1999)	Central govt.	–	EUR 20 million (2000) cost of inspections
Electricity pylons	Tax on transmission lines of 200 kV and over	Municipalities	–	EUR 134 million
Nuclear power plants	Inspection charge (1960)	Central govt.	–	EUR 129 million (2000)

a) Excluding energy and transport taxes (Table 5.2).
b) Unless otherwise specified.
c) Fonds national pour le développement des adductions d'eau.
d) Programme de maîtrise des pollutions d'origine agricole.
Source: IFEN.

Water Agency charges

The bulk of the revenue of environment-related economic instruments comes from the charges collected by the Water Agencies from local authorities, businesses and farmers, totalling almost EUR 1.6 billion in 2001. This money finances aid for sewerage and waste water treatment projects, chosen by River Basin Committees, to preserve water resources and control pollution (Chapter 3). The basic principle at work is "*water pays for water*", combined with the idea that charges should largely be used in the sector concerned. Water charges are a form of environmental taxation at

Table 5.7 **Trends in revenue from environmentally related taxes**

(EUR million)

	1995	2001	Change 1995-2001 (%)
Energy	23 487	24 685	*+5*
of which: *Taxes*[a]	*21 970*	*23 172*	*+6*
Transport	3 639	2 375	*–35*
Water	9 044	11 135	*+23*
of which:			
Taxes	*1 372*	*2 099*	*+53*
Charges	*7 672*	*9 036*	*+18*
Air	24	28	*+16*
Waste	2 532	4 163	*+64*
of which:			
Taxes	*111*	*670*	*+505*
Charges	*2 421*	*3 494*	*+44*
Natural resources	99	97	*–2*
Landscapes	212	284	*+34*
of which:			
Taxes	*118*	*156*	*+33*
Charges	*95*	*128*	*+36*
Risk prevention	102	149	*+47*
Noise	6	10	*+77*
Total revenue	39 145	42 928	*+10*
of which:			
Energy taxes	*23 487*	*24 685*	*+5*
Non-energy taxes	*5 470*	*5 584*	*+2*
Charges	*10 188*	*12 658*	*+24*

a) Domestic taxes on oil products (includes fuel taxes).
Source: Report to the Commission for Environmental Accounting and Economics.

river basin level rather than national level, and are *strongly influenced by the concept of mutual benefit*. Neither the River Basin Committees nor elected officials endorse the idea of collecting charges centrally and then redistributing them among various spheres of public action. They prefer to retain a system that is well-accepted by society, has proved effective and is used as a model. Thus, there is no pollution tax for water, only payments from the Water Agencies to MEDD for actions of interest to all six agencies.

Major changes to the financing system at river basin level would be inadvisable, but the Water Agencies need to improve the economic effectiveness of the financial aid they disburse. This is particularly important because water pricing is due to become more incentive-based by 2009 and should better reflect environmental costs. Accordingly, a *more rigorous economic approach* will be in order, along with development of cost-benefit analysis in river basin management. The *agricultural sector* will be asked to increase its contribution to the agencies' work, and municipal charges should be modified to reflect real pollution costs as far as possible. Needed reforms to Water Agency charges will be discussed in the context of a future Water Law that will increase parliamentary control of water charges but, under the *subsidiarity principle*, should leave the agencies and elected officials with considerable latitude.

Table 5.8 **Public environmental revenue and expenditure**, 2001

	Public expenditure on environmental protection[a] (EUR million)	Revenue[b] (excluding measures to recover costs) (EUR million)	Proportion of expenditure covered by revenue (%)
Water management	4 285	2 100	*49*
Waste	1 584	670	*42*
Air	60	28	*47*
Biodiversity and landscapes	429	156	*36*
Noise	80	10	*13*
Total	6 438	2 964	*46*

a) Excluding expenditure covered by charges for services provided.
b) Excluding charges for services provided (water and waste water: EUR 9 billion, municipal waste: EUR 3.4 billion), paid directly to municipalities.
Source: IFEN.

2.5 Voluntary instruments

Voluntary instruments include *voluntary agreements* and *voluntary information programmes* (e.g. certification and labelling programmes and environmental reporting). Voluntary agreements were used especially in 1996-97 to reduce GHG emissions in sectors including chemicals, steel, lime, cement, motor vehicles, glass and PVC. A new programme to cut industrial emissions of GHGs, introduced in July 2002, calls for voluntary commitments to reduce six types of GHG between 2003 and 2007. A first review was to be carried out in late 2004. It will be helpful to compare results in France with those in other European countries, which have been mixed. France's results will influence the eventual decision on whether to shift from a voluntary approach to more restrictive measures.

Since 2002, listed companies have been required to *include environmental information in their annual reports*. The European Commission has invited privately held companies to follow suit. Companies can also voluntarily seek *environmental certification* (e.g. ISO 14001, EMAS), but French companies seem less interested in this than are companies in other countries.

6

ENVIRONMENTAL-SOCIAL INTERFACE*

Features

- Social context
- Environment and employment
- Access to water and power
- Environment and health
- Legionellosis and classified installations
- Information and participation

* This chapter reviews progress over the last ten years, and particularly since the previous OECD Environmental Performance Review of 1997. It also reviews progress with respect to the objective "social and environmental interface" of the 2001 OECD Environmental Strategy.

Recommendations

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

- continue to promote environmental protection through proactive *employment* policies involving measures such as job creation and assuring a better match between training and employment;
- continue to improve solidarity funds for *access to essential goods* (water, energy, housing) by encouraging effective, long-term personal support; ensure that the planned water law favours access to water;
- continue to strengthen the *environmental health* sector by reinforcing expertise (e.g. develop training and research);
- free up the necessary resources to implement the *National Health and Environment Plan*, including the assessment of risks related to chemical products;
- pursue efforts to ensure that legislation on *access to environmental information* complies with recent EU directives, and take the necessary steps to implement the directives and the Aarhus Convention; better inform the public about its right of access to environmental information;
- continue to improve the co-ordination of information systems and the coverage and *quality of environmental data*, and increase the accessibility and use of such data in the development and monitoring of public policies;
- increase *environmental education* in primary and secondary schools.

Conclusions

Concerning *employment*, the "New Services, Youth Employment" programme introduced in 1997 encouraged the creation and contributed to the viability of environmental jobs, especially with local authorities and NGOs. France has also made great efforts to ensure that the most disadvantaged people have *access to essential goods like water and electricity*, and to this end is reorganising various solidarity funds and has introduced social tariffs that do not significantly distort price signals. Concerning *health*, the establishment of the French Agency for Environmental Health Safety (AFSSE) in 2001 and a review of links between the environment and health paved the way for the *National Health and Environment Plan* in 2004. It aims to reduce and prevent health risks connected with the environment in the broadest sense (including the outdoor and indoor environment and the work environment). Long experience with environmental *information* (e.g. state of the environment reports, publication of economic data on the environment, environmental indicators) and

effective and improved monitoring ensure that information is actively disseminated. The *right of access to environmental information* is enshrined in French law and can be invoked in court; the Environmental Charter will give it constitutional force. Under the 2001 Law on New Economic Regulations, listed companies are required to account in their annual reports for the social and environmental consequences of their activities. The *National Commission for Public Debate*, set up in 1997 as a tripartite, independent administrative body, conducts public consultation at an early stage of proposed infrastructure projects and land use change. Several times in recent years, public consultation has been extended to draft legislation and policy formulation, for instance on energy, climate and water.

Nevertheless, the solidarity funds designed to *give disadvantaged people access to essential goods* like water and energy do not have enough money to provide long-term support. Despite the creation of AFSSE, expertise remains too limited to cover a remit as extensive as environmental health. Primary and secondary schools have lacked ambition and organisation in *environmental education*, though the situation is improving. There is a *mismatch between types of environmental training* and actual environmental employment. Although most legal rules relating to environmental information are consistent with the corresponding international texts, transposing the related new EU directive into French law will require fresh *compliance* efforts. Implementing this directive and the Aarhus Convention will require better-organised access to information and improved responsiveness to public requests. The public still needs to be better informed about its *right of access to information*. Web sites are often unclear to inexperienced users; a national environmental information portal could improve the effectiveness, efficiency and use of the information available. More extensive environmental information on subjects such as industrial waste and biodiversity would be helpful.

♦ ♦ ♦

1. Environment and Employment

Given the high level of unemployment, jobs have long been a prime government concern and hence taken into account in environmental policies: the Commission for Environmental Accounting and Economics *regularly evaluates* the links between employment and the environment (Box 6.1).

The number of environmental jobs in Metropolitan France rose from 298 000 in 1996 to about 316 000 in 2002. This long-term rise seems to be more structural than cyclical. The New Services, Youth Employment programme contributed

Box 6.1 **Social context**

France has almost *61 million inhabitants*. The population is growing, but the growth rate has slowed to about 0.4% per year because of falling birth rates and the ageing of the population. Projections to 2025 indicate that the rate of population ageing will increase. Life expectancy is high: 75.5 years for men and 83.0 years for women, one of the highest figures among OECD countries. The differential between the sexes is one of the biggest in the European Union (Figure 6.1).

Over *80% of the French population lives in towns or cities*. Only four conurbations have more than one million inhabitants: the Paris area (with over 10 million) Lyon, Marseille and Lille. There are about 100 cities with between 50 000 and 200 000 inhabitants and 800 with between 10 000 and 50 000. Growth in major urban areas, which particularly attract migrants, is strongest on the outskirts, which means urban sprawl is increasing. The summer population of coastal communities is 2.2 times greater than their permanent population, with the biggest variations occurring in the south (Figure 6.1).

Population density is 108 inhabitants per square kilometre but varies widely by region. Some 43% of the population lives in four regions: Île-de-France, Provence-Alpes-Côte d'Azur, Nord-Pas-de-Calais and Rhône-Alpes. Île-de-France accounts for 18% of France's population and 2.2% of its surface area. Regional planning and development initiatives since 1950 have sought to remedy inequalities among regions. A slow shift in the balance has benefited western and southern France and Alsace.

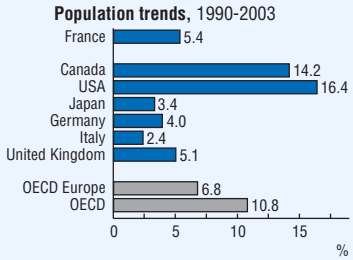
Per capita GDP is about EUR 26 000. Unemployment exacerbates income inequalities. The *unemployment* rate rose in the early 1990s to 12% before subsiding to 9.6% in 2003, still among the highest rates for major OECD countries. Fighting unemployment has been a top economic policy priority for many years (Figure 6.1).

Around 3.5 million people, 6.1% of the population, live below the *poverty* threshold (50% of median income), placing France near the EU average. Legislation to combat social exclusion, introduced in 1998, takes an integrated approach to poverty, emphasising access to rights such as employment, housing and health care, the prevention of exclusion and the role of social institutions.

significantly to the increase (Box 6.2). Two-thirds of environmental jobs are in *water, waste water and waste management* (Table 6.1). Eco-enterprises account for 57% of environmental jobs and public services for one-third, the remaining 4 400 to 9 000 jobs being with NGOs. The environment accounts for 1.35% of total employment in France. Waste management and water management were the sectors in which most of the jobs were created between 1996 and 2002 (Table 6.1), as a result of rises in waste recycling and local authority investment in waste water and sewage treatment networks.

Figure 6.1 **Social indicators**

Population and ageing

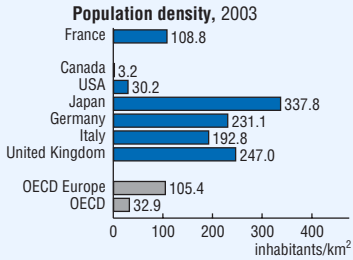


Population change		1990	2003
natural increase	‰	4.2	3.5
net migration	‰	1.4	0.9

Foreign population		1990	1999
	%	6.3	5.6

Ageing		1990	2002
over 64/under 15	ratios	0.70	0.87

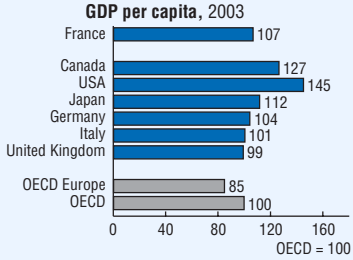
Settlement and mobility



Population by type of region	Early 2000s		
	% population	% area	density
urban	28.7	4.5	688
intermediate	41.3	34.4	130
rural	29.9	61.1	53

Mobility		1990	2003
car ownership	veh./100 inh.	42	49
rail traffic	billion pass.-km	73.9	83.1

Income and employment

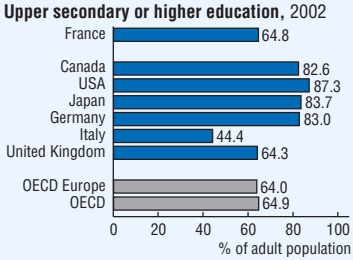


Regional disparities		Early 1990s	Late 1990s
GDP/inh.	variation coefficient	42.8	45.2

Labour force participation		1990	2002
total rate	%	66.6	69.9
female rate	%	57.8	64.2

Unemployment		1990	2003
total rate	%	9.1	9.8
female rate	%	11.7	10.8

Health and education



Educational attainment		1990	2002
upper secondary	%	..	64.8

Life expectancy			1990	2003
at birth:	total	years	76.9	79.4
	female	years	80.9	82.9
			1990	2001
at age 65:	male	years	15.5	16.9
	female	years	19.8	21.3

Source: OECD, Environment Directorate.

Box 6.2 **Environmental job creation programmes**

Aid for first-time jobs in new activities, a special instrument of environment and employment policy, has a twin aim: to generate employment for people in difficulty and young people entering the labour market for the first time, and to encourage formation of new activities. The Ministry of the Environment launched an "innovation, employment, environment" programme in the early 1980s to demonstrate the potential for environmental employment. A community work programme followed in 1984 and "solidarity" job contracts in 1989.

In the *New Services, Youth Employment* programme, launched in 1997, the government and partner organisations concluded five-year agreements. The programme was designed to place young, first-time job seekers in posts created to meet emerging or unsatisfied needs in areas including environment, sport, culture, education and local services. The programme ended in 2002. In 2003, 38 000 jobs were created in the environment sector, which accounted for 12.6% of youth employment in the programme, second only to social services. The young people were mostly hired by local authorities, especially for waste separation programmes, environmental education and the upkeep of natural areas. The programme helped encourage the growth of such activities and create long-term employment. It contributed significantly to the increase in public sector environmental employment. NGOs also benefited from the programme. Many of the new jobs are being made permanent, but it is too soon to draw firm conclusions about the overall effectiveness of the programme, the last contracts under which end in 2007.

Table 6.1 **Environmental employment**, 1996-2002

	1996	1998	2000	2002
Air pollution	9 400	9 300	7 500	7 600
Waste water	79 600	83 400	88 200	91 100
Waste	71 300	73 500	75 300	79 200
Rehabilitation of soil and water	400	500	500	1 700
Noise	7 400	7 200	8 300	8 500
Measurement and control	2 400	2 600	3 000	1 900
Nature, landscape, biodiversity	8 100	9 300	10 300	12 200
Water supply	48 800	33 700	32 300	31 800
Recycling	25 400	28 600	29 400	30 100
Quality of life	22 300	22 900	24 400	24 000
Cross-cutting activities	23 200	24 100	25 800	26 700
Total	298 300	295 100	305 000	314 800

Source: IFEN.

It is difficult to evaluate the effect of environmental policies on employment. Overall, the available data and various economic models suggest that *environmental policies have a small but positive effect on employment*. At first, environmental policies may have contributed to redundancies and site closures, albeit in conjunction with other factors. Later the acquisition of special equipment to assure compliance with environmental standards generated an expanding market (an additional thousand or so jobs between 1996 and 2000). The spread of certification could increase recruitment of executives with environmental responsibilities. Other factors, however, such as labour costs, exchange rates and market access, have a much greater influence on employment.

As regards *employment and training*, mismatches observed in the past still exist. The vast majority of environmental jobs are manual labour and involve pollution management; only some require environmental qualifications as such. In the latter case, jobs tend to be for people at higher qualification levels (managers, technicians) and involve nature management and protection. The response to this demand has tended to be a profusion of generally poorly focused training courses.

2. Access to Water and Electricity Services

The *right to water* has been fulfilled: almost 99% of the population is connected to water supply. The first *legislative measures* promoting access to water for all date from the early 1990s. The 1992 Water Law states that water is part of "the nation's common heritage" and that its "use belongs to all". The law includes measures specifically assuring access to water for itinerant groups. The latest draft water bill abandons the idea of a preferential tariff for a "first tranche of consumption corresponding to essential water needs" in water supply to primary-residence buildings, but it considers the possibility of a progressive tariff.

Solidarity measures aimed at rural areas include a fund to *develop water supply to rural communities*, with an annual budget in recent years of EUR 150 million. Another solidarity fund, aimed at people in financial difficulty, *helps pay delinquent water bills*. The price of water supply and waste water service provision rose by 8% between 1998 and 2001, to EUR 1.8-3.8 per cubic metre. Water services represent on average 3.3% of the income of a person on minimum income support, sometimes more than the poorest can pay. By law, water supply must continue until an aid mechanism intervenes. It is rare for water to be cut off because bills have not been paid; the case law discourages this, and service providers are not permitted to cut off water to a family with a young child or dependent person. Nevertheless, in about 2 000 cases a year disadvantaged households' water is cut off for more than 24 hours.

The *right to electricity* is made concrete through measures including geographic uniformity of tariffs, the right of all to connect to the network (including itinerant groups), a "social" tariff for the poor and aid from social services via a solidarity fund to pay overdue bills. *Tariff uniformity* results in a transfer of EUR 376 million per year from Metropolitan France to the overseas départements and Corsica, which do not have nuclear power. Concerning the *social tariff*, an April 2004 implementing decree provides for a 30-50% reduction on the first 100 kW of monthly consumption for 1.6 million households with income of under EUR 460 a month. The decree constitutes a major change, which could cost EUR 100 million per year. When bills are unpaid, rather than cutting off electricity, a "*vital" minimum* is supplied for a certain time (1 kW without electric heating, 3 kW with electric heating, under certain conditions). Despite these measures, electricity is cut off to some 12 500 poor households per year.

Solidarity funds, financed mainly by distributors, local authorities and central government, are a way of temporarily covering unpaid bills for people without resources. The first funds were set up in the early 1990s. They meet a statutory requirement: "any person or family encountering particular difficulties because of a precarious situation is entitled to assistance from the community to gain or preserve their access to water, power and telephone services". The housing solidarity fund helps people whose water bills are not subject to a separate invoice (being part of condominium fees) and responds to 60 000 requests a year, spending some EUR 75 million. The energy solidarity fund helps 220 000 households at a cost of about EUR 49 million. Although very useful, these funds could be further improved. An estimated 2 million people have to try to live on less than EUR 400 a month, not enough to meet all needs. Such funds do not yet cover all départements, nor are they large enough to provide long-term support or honour requests year-round. A new bill on devolution would devolve the housing, water, power and telephone solidarity funds to département level and combine them for efficiency's sake, but this measure will be fully effective only if the funds are increased in both the short and long term.

3. Environment and Health

3.1 The health care system

Public and private players participate in the French health care system as regards both care and insurance. National health insurance plays a major role, meeting 76% of health care expenses. The Parliament votes national health insurance spending targets annually. Policy guidelines and implementation are mainly the responsibility of the Ministry of Solidarity, Health and the Family. The ministry also determines the budgetary funds allocated to public hospitals. Below the national level, public health policies is mainly implemented at regional level (Table 6.2).

The French health care system is *effective*, as indicators show (e.g. waiting times, the range of choice afforded to patients, the infant mortality and women's life expectancy rates). Health care is available even to the poorest under universal coverage, introduced in 1998 and used by 4.7 million people in 2002, out of a target population of 6 million. The system is *expensive*, however, accounting for 9.5% of GDP. The ageing of the population and treatment innovations will mean still more costs. *Preventive medicine* gets relatively short shrift with only 2% of the health care budget. This disparity contributes to health care inequality that particularly affects the working class, where discrepancies in care quality can be considerable. The ministry sets the direction of public health policy each year, relying on a multi-year, strategic, yet insufficiently integrated vision.

The *public health approach* is gradually evolving. The National Health Accreditation and Evaluation Agency has been evaluating treatment strategies since 1996. Health safety agencies set up since 1998 form a network devoted to health monitoring and expertise. The 2004 Public Health Framework Law clarifies and simplifies the organisation of the health care system, emphasises the need to promote health and reduce inequality, and sets 100 health care objectives for 2004-08. Many of these are

Table 6.2 **Key health and environmental-health data**

Health care expenditure		The health of the French	
9.5% of GDP[a]		Life expectancy	83.0 years for women[b] 75.5 years for men
Financed by:		Annual deaths	540 000
		of which:	
Public health insurance	76%	Cardiovascular disease	165 000 (falling)
Households	11%	Cancer	150 000 (rising)
Mutual insurance	7%	Respiratory disease	45 000 (rising)
Private insurance	3%	Accidents and violent death	45 000
Central and other government	1%	Premature deaths	110 000
		of which (causes):	
		Tobacco	60 000
		Alcohol	20 000
		Road accidents	8 000
		Infant mortality	4.5 per 1 000

a) 4th in OECD ranking.
b) 2nd in OECD ranking.
Source: Department of Research, Studies, Assessment and Statistics; Ministry of Solidarity, Health and the Family; OECD.

quantitative, and tracking indicators are already available for about 40 of them. Eight of the objectives concern environmental health. The law also provides for plans to be drawn up concerning cancer, road accidents, disabilities, rare diseases and health-environment issues.

3.2 The link between health and environment

A *comprehensive review* was carried out in early 2004 as part of the preparation of the National Health and Environment Plan. Environmental factors have a proven or suspected role in certain worrying phenomena. The *incidence of cancer* increased by 35% between 1978 and 2000, even after adjustment for population ageing. Behaviour such as drinking and smoking cannot fully explain this trend. Many physical and chemical pollutants, or combinations thereof, in everyday environments are suspected. Asbestos, benzene, tobacco smoke, heavy metals and metalloids, radon and other forms of ionising radiation are known carcinogens. Other causes for concern are the suspected or proven effects of various pesticides, pharmaceuticals, metals, VOCs and other products on the *reproductive, nervous and endocrine systems. Respiratory allergies* are rising dramatically: the prevalence of asthma has doubled in 20 years. Pollen, fine particulates, pet allergens, moulds and tobacco fumes play a role in triggering attacks and aggravating symptoms, though whether they cause the illness has not been proved. There is growing concern about emerging *infectious diseases* such as legionellosis and nosocomial infections. Exposure to pollution occurs in the general environment (air, water, soil, food, habitat, consumer goods) (Table 6.3).

Environmental health initiatives in recent years include an expanding health and environment research programme launched in 1995 and involving the National Centre for Scientific Research (CNRS), the Ministry of Ecology and Sustainable Development (MEDD) and the French Agency for Environmental Health Safety (AFSSE). A prevention and precaution committee was set up in 1996 and AFSSE in 2001. France takes part in international chemical product risk assessment programmes. Many sectoral initiatives have been taken in the framework of classified installation inspections and water policy measures. Examples include work on preventing legionellosis, reducing six toxic substances (including metals) at source and implementing a glycol ether plan. Such initiatives do not go far enough, however; nor do environmental health training and research efforts, and all these areas suffer from the sector's lack of structure. The establishment of AFSSE was a step in the right direction, but the agency is still very small in relation to the issues at stake.

Broadly speaking, the 2004-08 *National Health and Environment Plan* (PNSE) is expected to result in considerable progress. It was drawn up and adopted (in June 2004) in accordance with the 1999 London Declaration, the 2003 national

sustainable development strategy, the 2004 Public Health Framework Law and the Environmental Charter incorporated into the Constitution in 2005. Its priorities were based on public health criteria without taking potential limits on resources into account. A comprehensive analysis of the situation in France was part of the exercise, covering health in the workplace as well as the general environment and habitat, since the PNSE is meant to address all types of exposure. The plan contains 45 extremely varied actions, of which 12 are particular priorities (Table 6.4). It should contribute to a better strategic vision and help improve environmental health. Implementation of the plan and the resources allocated to it will be regularly tracked, with the help of indicators. With a three-year budget of EUR 85 million, the plan will be monitored by a steering committee. The aim is to increase the budget to EUR 100 million per year.

Table 6.3 **Environmental factors and their health impact**[a]

Air pollution	32 000 premature deaths per year (of which 5 000 to 18 000 motor vehicle related) 110 000 cases of bronchitis and 60 000 to 190 000 asthma attacks per year 6 000 to 30 000 hospital admissions per year
Lead	85 000 children aged one to six (2% of the age group) with blood lead levels above 100 µg/litre
Radon	2 500 deaths per year from lung cancer 2.3% of dwellings with a concentration in excess of 400 Bq/m^3 31 départements with average atmospheric levels in excess of 150 Bq/m^3
Asbestos	2 000 deaths per year from lung cancer or mesothelioma (linked to past exposure) 25% of men over age 60 having been exposed during their professional lives
Carbon monoxide	150 to 300 deaths per year from poisoning, at least 6 000 cases of poisoning per year in the Paris area
Noise	7 million persons exposed to traffic noise levels in excess of 65 dB outside their homes, 40% of the population claiming to be bothered by noise
Microbiological water quality	10-50% of cases of acute gastroenteritis attributable to piped water 8% of the population affected by substandard water
Legionellosis	Over 1 000 cases and 150 deaths per year
Nosocomial illnesses	7 000 to 20 000 deaths per year
Mercury	At least 150 people with capillary level in excess of 10 µg/g (all in French Guiana)
Pollen	10-20% of the population reporting pollen allergies

a) Some data are precise, others estimated.
Source: National Technical Group for Defining Public Health Objectives; Health and Environment Plan Guidance Commission.

Table 6.4 **National Health and Environment Plan priorities**

Objectives	Priority actions
Guarantee good quality *air* and *water*	– Reduce emissions of *diesel particulates* from mobile sources by one-third by 2010 – Reduce emissions to air of *toxic substances* of industrial origin by 85% for dioxins, 50% for cadmium, 65% for lead, 40% for vinyl chloride monomer and 35% for benzene by 2010 – Assure protection of all *drinking water withdrawal points* (37% now, 80% in 2008, 100% in 2010) – Better understand the factors determining *indoor air quality* – Introduce labelling for health and environmental characteristics of *construction materials* so that 50% of construction products on the market are labelled by 2010
Prevent *pathologies* of environmental origin, especially cancer	– Reduce *professional exposure* to carcinogenic, mutagenic and reprotoxic agents – Increase *capacity for evaluating* the health risks of dangerous chemical substances – Increase *fundamental knowledge* of the environmental and societal determinants of human health and develop new methods in experimental sciences
Provide the public with better *information* and *protect at-risk populations*	– Facilitate *access to environmental health information* and foster public debate – Carry out an *epidemiological study* of children – Improve the *prevention of lead poisoning in young children* and the identification and treatment of children suffering from lead poisoning – Reduce the incidence of *legionellosis* by 50% by 2008

Source: MEDD.

3.3 Air quality and health

By controlling stationary sources and improving fuels and engines, especially in cars, France has made considerable progress concerning *air pollution* (e.g. reduced SO_2 and heavy metal emissions). Rising traffic levels, however, have neutralised progress on some pollutants, such as ozone. As a result, air quality remains a public health concern, especially in urban areas (Chapter 2). Apart from short-term effects on populations at risk, air pollution is thought to cause a substantial number of premature deaths affecting the entire population in the long term (32 000 premature deaths per year, 5 000 to 18 000 of them attributable to motor vehicles) (Table 6.3). Fine particulates are a notable culprit. The 1996 Law on Air and Energy Efficiency has helped improve monitoring and public information. Progress is still needed to reduce pollution in major urban areas. Action should be taken, for example, to increase use of cleaner vehicles, speed up renewal of the vehicle fleet, tighten standards for motorbikes and scooters and increase use of such economic instruments

as parking meters and congestion charges. At national level, combined transport should be encouraged on main routes, where analysis of both economic and environmental criteria shows this to be economically viable. The policy of controlling urban sprawl under the Law on Solidarity and Urban Renewal needs to be continued (Box 6.1, Chapter 2).

Air quality in buildings is a growing cause for concern, as people spend 90% of their time indoors, including 70% in the home. Measurements taken by the Indoor Air Quality Research Centre, founded in 2001, have revealed VOCs from construction materials, allergens, tobacco smoke, carbon monoxide and radon, for example. Ventilation flows do not meet standards in 57% of cases, contributing to the accumulation of pollutants in buildings. The National Habitat Improvement Agency gives grants to owners and tenants, especially for work to improve the safety, salubrity and fittings of housing. A January 2002 decree defines the characteristics of decent housing. Integration between the health care and building sectors could be improved, however, by revising regulations nationwide on safety and health aspects of buildings, especially ventilation, and by requiring habitat health reports any time a dwelling is sold or rented.

3.4 Water quality and health

The *quality of drinking water resources* is insufficient in many cases as regards pesticides, nitrates and microbes (Table 6.4). Rural areas and some regions, such as Brittany, are particularly affected. The resource as a whole increasingly gives cause for concern: in 2002, samples at 80% of the 400 monitoring points for surface water, and 57% for groundwater, contained at least one pesticide. The results are better at drinking water supply points. Nevertheless, a more integrated approach to drinking water quality is needed. Palliative measures during production of drinking water are insufficient for the long term. Action needs to be taken earlier in the process, such as *improving catchment protection* and controlling *diffuse pollution*. Protecting catchments is an objective of the PNSE. Discharges from stationary sources are under control but not enough is being done to prevent pollution of *agricultural origin*. Possible measures could include tightening environmental conditions attached to farm support and increasing the pesticide tax (Chapter 3).

3.5 Specific environmental health problems

Some problems related to pollution in general environmental media, such as air and water, affect much of the population. Others affect particular groups: children, old people, the poor. *Lead poisoning in children* occurs in dilapidated, pre-1948

Box 6.3 **Legionellosis and classified installations**

Legionellosis is a respiratory infection caused by the legionella bacterium, which lives in fresh water and proliferates between 25 °C and 45 °C. When inhaled, the bacterium can cause a benign infection that may go unnoticed or a serious infection that is fatal in a little over 15% of cases, especially among the elderly and people with depressed immune systems. Legionellosis gets considerable media coverage in France because it causes *avoidable deaths*. Declaration of outbreaks has been compulsory since 1987. The number of declared cases has risen by about 30% a year since 1997, when better monitoring was introduced: 80 cases were diagnosed in 1996 and *1 044* in 2003. The incidence of 1.7 cases per 100 000 population gives France one of the highest rates of legionellosis among EU countries. Most cases are isolated and the origin of the contamination is rarely identified, but there is a risk of legionella bacteria proliferating in hot water systems, air conditioning systems and hot springs (which come under the remit of the département Health and Social Project Directorates, the DDASS) as well as in classified installations, e.g. cooling towers used in some industrial processes (sugar, glass, chemicals, etc.), for which the Regional Industry, Research and Environment Directorates (DRIRE) are responsible. Hence, the DDASS and DRIRE target special measures against legionellosis.

France is part of the European Working Group for Legionella Infections. Many circulars and best practice guides (e.g. for health spas and cooling towers) have been published. Much emphasis is placed on communications and information. More is being done to find the source of contamination. With several outbreaks casting suspicion on classified installations, *MEDD has stepped up its action in recent years*. Since 1999, prefectoral licensing orders for classified installations have included instructions on preventing legionellosis for the relevant sector, including measurement of concentrations. In 2003 and 2004, preventing legionellosis was a priority issue in inspections of classified installations. In this context, an inventory of cooling towers is being drawn up: 5 500 have been identified so far, and 450 prefectoral orders have been issued, both for installations that have to be licensed and for those merely declared. Over 3 500 bacteriological checks have been carried out. In 6% of cases the measured concentrations led to cleaning of the installation, and in 2% the installations were closed for decontamination. A government plan on preventing legionellosis was introduced in June 2004.

housing containing lead paint. Ambitious, targeted measures have been taken for many years to combat the problem, which is thought to affect some 85 000 children. But the system is not effective enough, levels of commitment vary considerably among regions, health care professionals are insufficiently aware of the issue and the need to rehouse families can pose problems. As a result, most of the money allocated is not used. The PNSE provides an opportunity to relaunch the policy. *Exposure to*

asbestos, mainly affecting manual workers, causes about 2 000 deaths a year. The government has set up a fund providing full compensation to victims. Special prevention measures also exist for *legionellosis*, which affects the elderly and those with depressed immune systems. Some 1 000 people contract the disease each year and about 15% die (Box 6.3). In French Guiana some native populations suffer from exposure to *methyl mercury* near often-clandestine gold panning sites. The PNSE and the Public Health Framework Law cover all these points and should help reinforce action already being taken (Table 6.4). The Health Monitoring Institute also contributes to better health risk management.

4. Environmental Democracy: Information, Access to Information and Participation

4.1 Production, dissemination and quality of environmental information

France has long had a *proactive policy* of informing the public about environmental matters. For example, it keeps good inventories of pollutant emissions, issues a *state of the environment report* every four years and is one of the few OECD countries publishing annual *economic data* on the environment, presented to the Commission for Environmental Accounting and Economics. Several sets of *environmental indicators* are available (performance indicators, sectoral integration indicators, regional indicators) and a new set on *sustainable development* will be the basis for regular reports to the *Parliament* tracking implementation of the national sustainable development strategy. Plans also call for including environmental indicators in parliamentary budget documents.

Environmental *monitoring networks* are regularly reviewed and optimised and are generally of *very high quality*, despite some inadequate monitoring of drinking water resources in agricultural areas. *Air quality* monitoring has improved since 1997, in terms of the number of sensors and the forecasting system, and several *research centres* have been set up, not only for research but also to carry out monitoring in certain areas, such as climate, water, landscapes and wetlands, though their results need to be assessed. The monitoring of *water withdrawals* and *water quality* has improved, notably under the impetus of EU regulations: a national water data network was set up in 1997 and an *integrated system for producing and disseminating water information* was established in 2004 with the co-operation of MEDD and 12 other partners (Chapter 3).

Many players are involved in the *production and dissemination* of environmental information, including public authorities, businesses and environmental NGOs. At national level, the environment is one of the chief working areas of the National

Statistical Information Council. The French Environment Institute (IFEN), which combines statistical and scientific expertise with a certain degree of independence, plays a key role in the *analysis and synthesis* of environmental data and has done much to circulate information more widely to the public. Its action is backed up *locally* by decentralised government agencies (Regional Environment Directorates [DIREN], DRIRE, regional and departmental prefectures) and *nationally* by the statistical units of other ministries (e.g. the one in charge of agriculture) and bodies such as the Environment and Energy Management Agency, the Interprofessional Technical Centre for Air Pollution Studies and the Water Agencies. Local authorities such as the Savoy département council also publish environmental data.

The government agencies and other organisations that develop environmental information are actively encouraged to *disseminate* it. Many reports, inventories and databases can be consulted online. The *Internet* is increasingly used to *anticipate public demand*. IFEN offers a range of publications, including an online *catalogue of environmental data sources*, accessible by subject, producer and geographical area, and ten times per year publishes a four-page *thematic brochure*, online and by subscription.

Many *companies* include environmental information in their annual reports. Since 2002, *listed companies* have been required to incorporate in their annual reports information about their response to the *social and environmental consequences* of their activities. This obligation, introduced in the Law on New Economic Regulations, applies to about 950 companies. The information to be included is based on international *indicators* used by bodies such as the OECD, the United Nations and the European Union. The companies are responsible for quality assurance of this information. They have generally *welcomed* the new requirement, but before making further efforts they are awaiting the results of an initial evaluation commissioned by the government to identify best practices.

Thus, France has a *rich and relatively well-balanced corpus of environmental information*, though it could be *strengthened, better structured and better used* in the framing and evaluation of government policies. As in other OECD countries, the information needed to evaluate *long-term* environmental progress and identify *emerging problems* is still insufficient, and *gaps* remain in areas such as industrial waste, biodiversity and risks linked to the toxicity of pollutants. The lack of regularity in updating *natural heritage accounts* is to be regretted, as is the absence of a *comprehensive, integrated compendium* of environmental statistics, though the statistical digest produced in 2000-01 and the forthcoming database of essential environmental data offer some interesting opportunities in this respect. The *timeliness* of data and indicators needs to be improved, and the quality and production of data associated with *international environmental co-operation* should be stepped up.

4.2 Access to information

Legal framework

The *right of access to environmental information* held by the public authorities is governed by legislation on relations between the government and the public in general. The law of 17 July 1978 establishing the principle of *free access to government data* also set up the Commission on Access to Government Documents (CADA), an independent authority that advises government agencies and serves as the body of first appeal. The right of access to environmental information is also enshrined in the Environment Code and in many other laws (e.g. the Rural Code, the Law on Enhanced Environmental Protection) and regulations on matters such as waste, air quality, risk and genetically modified organisms. The 2003 Law on the Prevention of Technological and Natural Risks and Repair of Damage contains provisions on informing the public and the populations exposed to risks (Box 5.6). France ratified the *Aarhus Convention* in September 2002, took a step towards giving *constitutional force* to the principle of access to environmental information by adopting the *Environmental Charter* in 2004 and incorporated the Charter into the Constitution in 2005 (Box 5.2).

"Access to environmental information" refers to data collected or produced by a public agency in carrying out its mission. The information must be provided *within one month* after the request is made, and the *cost* to the requester may not exceed the cost of copying the documents. After this deadline has passed, lack of a response from the agency concerned is deemed an implicit *rejection* of the request. *Access* to data *may be refused* on grounds of national security, confidentiality of certain public decisions and industrial or trade secrecy. Access may also be refused to documents being used in preparation for an administrative decision that has not yet been issued.

The absence of a specific right to environmental information complicates the transposition into French law of the relevant EU directives. The European Court of Justice has condemned France for incompletely and incorrectly transposing several provisions of EU directive 90/313/EEC. After amendment, the current legislation *meets most international requirements* on the subject, such as those of the 1998 OECD Council Recommendation. It does not conform, however, to the *new EU directive* on public access to environmental information (2003/4/EC), which was due be transposed by 14 February 2005. Transposition will mean the scope of the concept of environmental information will have to be reviewed, as will exceptions to the obligation to disclose such information. Steps to assure compliance should be accompanied by *regular monitoring of implementation* of the relevant legislation and of the Aarhus Convention.

Implementation

Little information is available about the *actual application of these legal* provisions, difficulties encountered or the number of official complaints following a refusal to provide information. However, administrative justice is well-established in France and *access to justice is generally satisfactory*. Complaints and appeals relating to refusals or restrictions on access to environmental information go first to CADA (though its decision is not binding on the agency involved), then to administrative courts if necessary.

Most *requests for environmental information* are made at *subnational level* on subjects essentially related to the concerns of the local public and stakeholders. Evidence of this phenomenon can be seen in the growing success, with the public as well as with local authorities, of the Web sites of decentralised central government services. Demand at *national level* is different and tends to be for aggregated data intended to inform public debate.

Policy on access to information still lacks overall coherence and would benefit from being strengthened. The public is not well enough informed about its right of access: for example, no guidelines on procedures for obtaining information are available. The development of structures and *funding to facilitate responses to requests from the public* has long been neglected, and efforts to enable access to environmental information *remain piecemeal*. Some Web sites are still unclear, and browsing among the relevant sites not easy for inexperienced users. There is no *environmental information portal* similar to those that the government provides on agriculture and fishing. Such a portal would not only make it possible to provide structured, easy access to all environmental information but would also favour the use of existing information at lower cost.

4.3 Public participation

Consultation between public authorities and relevant stakeholders regarding draft legislation, public works projects and policy making *is widespread* in France. Consultation on environmental issues, among other areas, is *systematic and required by law*. It is carried out through impact studies, public enquiries on classified installations and public input on instruments such as urban mobility plans and regional industrial waste elimination plans.

Since 1997, France has taken steps to increase *grassroots democracy*, make consultation procedures more efficient and comply with new EU and international requirements. These efforts are reflected in the widespread use of consultation and public enquiries, and in a broadening of the scope of public debate. The *National Commission for Public Debate* (CNDP), established in 1997, has been transformed

into an *independent* administrative authority comprising elected officials, senior judges and representatives of civil society. Its aim is to make public participation procedures more transparent, starting with those concerning *public works and development projects in the national interest*. Its increased powers mean that MEDD can ask it to organise public debates on *general options relating to the environment* or planning, or to advise on the organisation of *public consultation exercises* like the one on *water policy* launched in 2004.

Other recent initiatives have included national debates and public consultation on proposed legislation and policy guidelines relating to energy, climate change (for instance, regarding quota allocation plans) and the Environmental Charter. NGOs say some consultation (relating to energy, for example) does not go far enough in eliciting feedback and taking it into account in decision making.

Access to documents during consultation procedures is generally satisfactory at national level, particularly in the context of impact studies and public works projects in the national interest, both of which are covered by specific rules, and in debates co-ordinated by CNDP. The situation is more variable at subnational level and would benefit from greater harmonisation; stakeholders complain, for instance, that many complex draft documents are not available until late in the proceedings. The restriction on access to *preparatory documents* related to future administrative decisions is another subject of criticism, especially as regards decisions concerning the operation and upgrading of waste treatment facilities under regional authority.

France has long had a *flourishing network of non-profit organisations* concerned with a wide range of issues. Environmental NGOs have expanded considerably in number and membership in the past ten years, reflecting growing concerns about health and about natural and technological risks. Such groups' dynamism, expertise and interaction with central and local authorities give further impetus to France's network of non-profit organisations when it comes to environmental issues. Several environmental NGOs are nationwide in scope and are represented on advisory bodies and CNDP. Officially recognised NGOs can sue for breaches of environmental laws and regulations. Certain non-profits that have been registered for at least five years have the same right with regard to water and classified installations. Despite a broadly favourable trend and growth in membership, many non-profits have long been in financial difficulty; a decline in public funding and other aid to environmental NGOs, including the end of the youth employment programme, has reduced employment and activity in the sector.

Local Agenda 21

Some French cities drew up Agenda 21 programmes as early as 1995, though the government did not actively promote them nationwide until 1997. Local Agenda 21

(LA21) programmes are a *voluntary initiative on the part of local authorities*. Their main value lies in their cross-cutting approach and the quality of reflection and dialogue they enable among local officials, residents and other local players. Hence, they serve as a useful complement to other regional and local planning tools and encourage social cohesion in disadvantaged areas.

More than 100 local authorities have drawn up LA21 programmes or expressed their intention to do so. The *national sustainable development strategy* envisages 500 such programmes by 2008. A national steering committee with broad stakeholder representation (involving 55 local and regional sustainable development organisations) handles calls for projects and subsequently monitors them. Each project selected receives a lump-sum grant of EUR 15 000. Some regions also give grants to regional initiatives.

5. The French and the Environment: Perception, Knowledge and Practice

French views on the environment are regularly monitored, notably by IFEN and the Research Centre on Environmental Practices and Perceptions. In 2001, *18% of French people said the environment was their chief worry*. This figure, higher than in previous years, reflects a broader trend of growing concern about risks facing society, probably linked to a series of events including the Erika oil spill, violent storms, and flooding in southern France (late 1999); flooding in western France (late 2000-early 2001); and the accident at the AZF plant in Toulouse (autumn 2001). The French are concerned about the *state of the planet*: 48% think it is poor. Opinions are more positive at local level: 90% of French people think their local environment is good, though views on subjects such as air quality, noise and local exposure to natural risk vary according to region, urban density and type of dwelling. Nationwide, *air and water pollution* are easily French people's chief environmental concerns. Combating the greenhouse effect comes sixth in a list of priorities that people think the government should adopt.

While the population as a whole is aware of environmental issues, its *knowledge on certain points could be improved*. According to some surveys, one-third of French people know what "sustainable development" means. One-fourth cannot decipher certain eco-labels (e.g. those indicating organic and ozone-friendly products). The water cycle is not well understood. Concerning water pollution sources, 61% of the French think industry is the main culprit, 26% say it is farming and only 6% blame private consumption. In addition, only 8% think they can act individually to reduce air and water pollution. Thus, communication on environmental matters could be improved. There is demand for information at local level in particular.

Nevertheless, *environmentally sound practices* are slowly gaining ground in households. Very substantial progress has been made in waste disposal: half of the French believe that waste separation is their most important contribution to protecting the environment. In 1998, 64% regularly sorted glass and 36% sorted paper, and the figures have almost certainly risen since. Differences in behaviour are linked to conditions such as housing and income as well as *socio-cultural factors*. By and large, relative wealth is linked with better environmental practice, though lower-income people are more likely to conserve water and use bicycles or other alternatives to private cars.

To improve environmental awareness, *environmental education* in primary and secondary schools has gradually been increased. A 1977 government circular introduced environment in curricula, and a 1993 protocol between the ministries in charge of environment and education added the concept of sustainable development. These two key documents introduced a broad concept of environment with an interdisciplinary approach, and have encouraged interesting local initiatives. They were backed up in 2005 by the incorporation of the Environmental Charter into the Constitution: it introduces the role of education and training as a condition for exercising environmental rights and performing environmental duties. Environmental education for sustainable development has been introduced throughout the school curriculum, from primary school to upper secondary level.

7

SECTORAL INTEGRATION: ENERGY*

Features

- Energy efficiency and management
- Renewable energy sources
- Nuclear power plants
- Management of radioactive waste
- Energy taxation and the environment

* This chapter reviews the progress made over the past ten years, and particularly since the previous OECD Environmental Performance Review of 1997. It also reviews progress with respect to the "decoupling environmental pressures from economic growth" objective of the 2001 OECD Environmental Strategy and takes account of the latest IEA Energy Policy Review of France.

Recommendations

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

- increase efforts to make an *economic valuation of environmental damage* caused by the energy sector so as to better internalise external costs in energy prices ;
- step up efforts to *save energy*, with due attention to the cost-effectiveness of the measures taken ;
- undertake economic analysis of government policies to promote *renewable energy sources* so as to minimise the cost to society ;
- reform *energy taxation* to better integrate environmental concerns (e.g. continue moving towards balanced taxation on diesel and petrol, abolish the tax on hydroelectricity); set up a green tax commission;
- assess the potential environmental consequences of *liberalising the gas and electricity* markets; introduce safeguards if necessary;
- continue to make the *nuclear sector* more transparent, including through greater access to information.

Conclusions

France's *energy intensity* has continued to decrease steadily since the previous OECD review, especially in industry. The decrease is due to productivity gains and improved energy efficiency, stimulated since 1998 by incentives, regulation and information. A particular effort has been made in the case of small and medium-sized enterprises, through the Environment and Energy Management Agency. In addition, emissions of the *main air pollutants* have declined significantly in energy generation, which is all the more remarkable as the electricity supply is 90% non-thermal (78% nuclear, 12% hydroelectric and other renewable sources). France's *energy policy* objectives have not changed since 1996. The national debate in 2003 revealed a quasi-consensus on the main energy concerns (security of supply, energy competitiveness, respect for the environment, solidarity between regions and with the disadvantaged), culminating in a white paper and a framework energy bill currently before the Parliament. The main thrusts of the bill are a policy of energy conservation and efficiency, diversification of energy sources and the preservation from 2020 of all energy options, including that of nuclear power. In institutional terms, in 2002 the supervisory aspects of *nuclear safety and radiological protection* were combined in a single body, the Nuclear Safety Authority, and the corresponding expertise was concentrated in the Radiological Protection and Nuclear Safety Institute. This marks a step forward in the consideration given to risks related to nuclear power

stations for those who work in them and for the general public. France has a long tradition of planning in energy and in the *framing and evaluation of government policy*. The energy outlooks and assessments prepared during the review period by bodies like the Directorate-General for Energy and Raw Materials of the Ministry of Economy, Finance and Industry, the Planning Commissariat, the Economic Analysis Council and the Parliamentary Office for the Evaluation of Scientific and Technological Choices provided a very useful contribution to decision making.

Despite this progress, the energy intensity of the French economy remains slightly higher than the OECD Europe average. The situation in the *transport* sector gives particular cause for concern because of the increases in overall consumption and numbers of vehicles. Not enough is being done to *save energy*, given the many benefits that can be expected from energy conservation. Energy saving is not a research and development priority and few measures are designed to limit demand growth. Very few external costs are internalised in energy prices, as the rationale of energy *taxation* is not based on integrating environmental concerns into energy policies. Internalising these costs could substantially change the choice of energy sources. Renewable energy sources offer many benefits to society, but factors such as the number of administrative permits needed, delays in issuing them and the absence of a one-stop subsidy-granting body hinder the penetration of *renewable energy sources* such as solar power. Some NGOs charge that *consultation* in the public debate preceding the drafting of the framework energy bill was insufficient and biased.

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1. General Trends in the Sector and Environmental Impacts

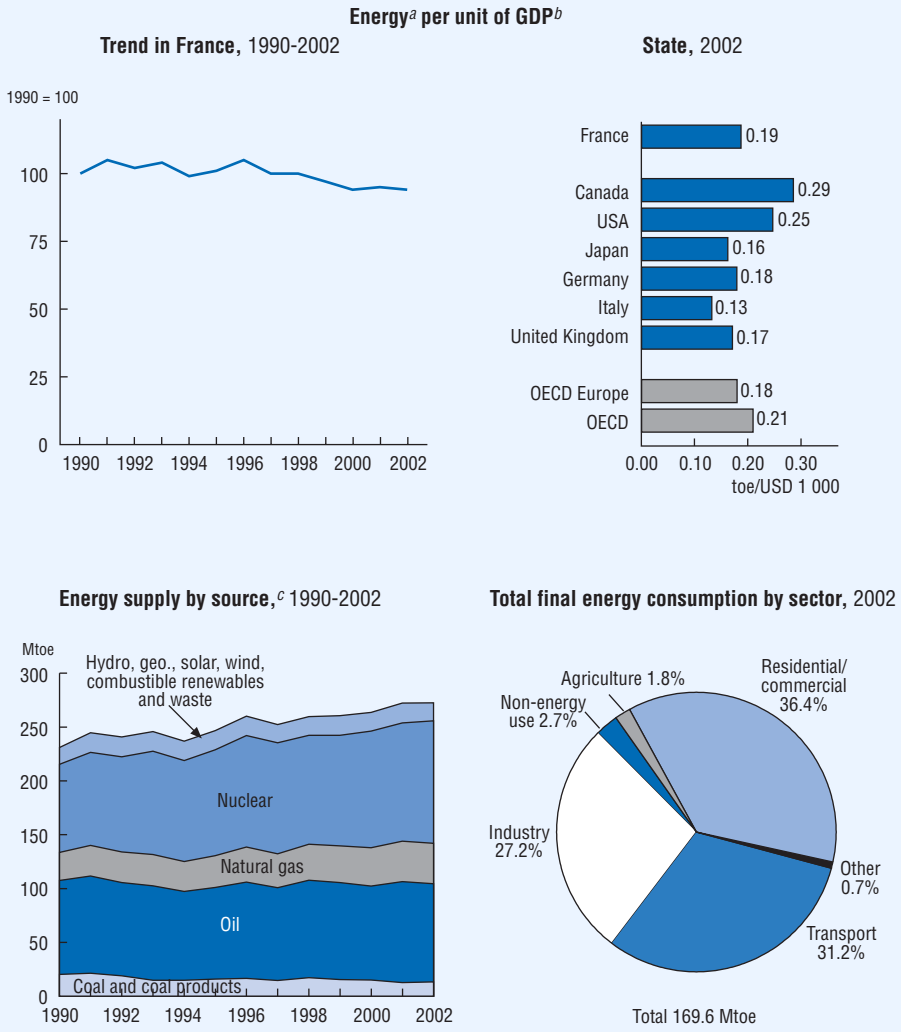
In 2003 the French energy sector accounted for *2.5% of GDP*, 19% of industrial investment (and 5% of total investment), 1% of jobs nationwide (employing 230 000 people) and around 16% of the country's imports (worth EUR 24 billion). Energy also accounted for 6% of household expenditure, on average (EUR 62 billion), and 5% of intermediate consumption in industry (about EUR 50 billion). France has 13 oil refineries, and 59 nuclear power reactors on 21 sites.

1.1 Structure of energy supply and demand

Supply

France's *total primary energy supply* (TPES) in 2003 amounted to 272.1 million tonnes of oil equivalent (Mtoe). Growth in supply averaged 1.6% a year from 1997 to 2003 and 1.4% from 1990 to 2003 (Figure 7.1).

Figure 7.1 **Energy structure and intensity**



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

The *supply mix* in 2003 was as follows: nuclear energy (42.20%), oil (33.80%), natural gas (14.40%), coal (5.00%), biomass (4.40%), hydroelectricity (2.10%), geothermal power (0.05%) and solar and wind power (0.04%). Electricity exports are equivalent to 2.2% of TPES and 12.7% of the electricity generated in France. In recent years the shares in TPES of the various energy sources have not changed significantly, except that the share of coal has declined in favour of natural gas. The long-term trend has been for oil to be replaced by nuclear energy, which in 2003 accounted for 78% of the electricity generated in France.

Demand

In 2003 *total final consumption* in France came to 175.3 Mtoe. From 1997 to 2003 consumption grew by 1.2% per year and from 1973 to 2003 by 0.7% per year (Figure 7.1). By way of comparison, between 1973 and 2002, total final consumption grew by 0.9% per year in the countries of IEA Europe and by 1.1% per year for all IEA countries. In 1973 oil accounted for 68.0% of total final consumption in France, but by 2003 its share had fallen to 49.6%. Coal's share fell from 9.0% to 1.5% while the shares of electricity and natural gas increased over the period to, respectively, 20.3% and 19.2%.

The *transport sector* remains the largest end user of energy, accounting for 31% of total final consumption in 2003, followed by the residential sector (28%), industry (27%) and the commercial sector (8%). Over the long term, energy demand grew more in transport than in any other sector, rising by 93.5% between 1973 and 2003 while demand from industry declined by 8%. Transport sector energy demand fell by 1.1% in 2003, thanks to road vehicles' improved compliance with speed limits.

1.2 Environmental impacts

Improving understanding of impacts

Energy production and consumption have numerous *impacts* (e.g. on human health, ecosystems, buildings, crops, landscapes and climate change) and carry risks (of accidents and sabotage, for example) (Tables 7.1 and 7.2).

The energy sector is responsible for a large share of *air pollution*. The production, transmission, transformation and use of energy account for: i) among *conventional pollutants*, 75% of SO_2 and CO emissions, 50% of NMVOC emissions, 85% of particulates and almost all NO_x emissions; and ii) 75% of France's *greenhouse gas* (GHG) emissions (Chapters 2 and 8). Nevertheless, the use of nuclear power has allowed France not only to cut CO_2 emissions but also, according to the Ministry of Economy, Finance and Industry (MINEFI), to avoid emitting 1.7 million tonnes of SO_2 and 890 000 tonnes of NO_x per year.

Table 7.1 **Energy-related risks and environmental impacts**

ENERGY CONSUMPTION	
Air	Emissions of CO_2, CO, SO_2, NO_x, VOCs, dust, heavy metals and PAHs (combustion) Releases of CFCs and fluorinated gases (air-conditioning and refrigeration systems)
Waste	Ash, oil, sludge (combustion plant)
Risks	Fire, explosion, electrocution, poisoning
ENERGY PRODUCTION	
Air	Emissions of SO_2, NO_x, CO, VOCs (coal mining) Releases of organic compounds, dust and methane (oil and gas extraction, oil refining, gas storage and distribution) VOC emissions (storage, transport and distribution of oil products, notably fuels)
Water	Waste that can contaminate river water (power plants, coal mines, refineries) Heat pollution that can damage aquatic ecosystems (discharges of cooling water from conventional thermal plants and nuclear plants) Modification of flow regimes in waterways (hydropower projects) Contamination from degassing at sea (oil tankers) Pollution by fertilisers and pesticides (biofuels)
Accident risks	Nuclear accidents (nuclear power plants, reprocessing plants, transport of nuclear material) Fire (oil rigs, storage sites and refineries, oil and gas pipelines) Oil spills (tanker wrecks) Explosion, subsidence, rock falls (coal mines) Catastrophic failure (hydroelectric dams)
Sabotage risks	Attacks on production, transport or storage facilities (nuclear power plants, storage sites for nuclear materials, methane terminals, hydroelectric dams, etc.) Theft of hazardous materials
Waste	Sterile waste (coal mines) Radioactive waste (nuclear installations) Oil refinery waste
Impact on landscape and nature	Destruction or modification of ecosystems (hydroelectric dams, wind turbines, solar panels) Landscape severance and damage (oil and gas pipelines, high-voltage transmission lines)
Chemical substances and radioactive materials	Radioactive liquid waste releases (nuclear power plants, spent fuel reprocessing plants) Toxic substances contained in unburned solids (ash) or dust from fuel combustion
Noise	Thermal plants (motors in particular)
Soil	Contamination (coal and uranium mines, former gas plant sites) Brownfield sites

Source: IFEN.

During the *heatwave and drought in the summer of 2003* it became clear how essential water was to the operation of both hydroelectric and thermal power plants (conventional and nuclear). In the case of nuclear plants, given that the severe weather had increased temperatures in some rivers by around 5 °C above the averages recorded in the past 25 years, several reactors had to be either shut down or operated on reduced load. In addition, high demand for electricity in response to the heatwave prompted operators to seek and obtain waivers to waste water discharge permit conditions. Thus, on 2 August 2003, the ministers responsible for the environment, health and industry issued an order authorising power plants on the Rhône, Moselle, Garonne and Seine rivers to remain in operation by discharging cooling water at temperatures above the limits authorised by the plants' discharge permits, as long as river temperatures rose by no more than 1-3 °C, depending on the type of plant and the river concerned. The waiver expired on 30 September 2003, and in the end was very little used. Only with time will the impact on these rivers of the heat discharges in the summer of 2003 be fully understood, but to date no significant effects have

Table 7.2 **CO_2 emissions from energy combustion,**[a] 1990-2002

($Mt\ CO_2$)

	Oil		Coal and derivatives		Natural gas		Total		Variation (%)
	1990	2002	1990	2002	1990	2002	1990	2002	2002/1990
Total	223.0	240.6	73.7	50.4	56.1	86.1	352.7 *100.0*	377.1 *100.0*	*6.9*
Energy production and transformation	20.2	17.6	39.2	31.4	1.6	8.8	61.1 *17.3*	57.8 *15.3*	*–5.3*
Industry and building	27.9	28.9	27.9	16.9	24.5	34.3	80.3 *22.8*	80.0 *21.2*	*–0.3*
Transport	115.9	140.8	–	–	–	0.1	115.9 *32.8*	140.8 *37.4*	*21.6*
Residential sector	34.0	31.5	6.5	2.1	15.4	42.2	55.9 *15.9*	75.8 *20.1*	*35.6*
Other	25.0	21.8	–	–	14.6	0.8	39.6 *11.2*	22.5 *6.0*	*–43.1*

a) Sectoral approach.
Source: IEA-OECD.

been observed. For example, fish seemed to have coped with the higher than normal temperatures, anglers' associations have reported. The main impact of the heat wave on the environment-energy interface may well stem from the increased installation of air conditioning (e.g. in residences and businesses), entailing higher electricity consumption during the hottest parts of the year.

Improving economic assessment

Quantifying and costing the environmental impacts of the energy sector poses several challenges. Much progress has been made in recent years in *assessing the external costs of the energy sector*. In particular, the ExternE project, a European Commission study on cradle-to-grave costs of the electricity life cycle, estimated external costs in the electricity industry for the EU15 at 1% of GDP even with externalities in the nuclear cycle only partially valued at just 5% of production costs. The study included life-cycle analyses of several energy sources for France: coal, natural gas, fuel oil, nuclear power, biomass and waste incineration. If climate impacts are factored in, externalities may exceed electricity production costs for generation based on coal and fuel oil, depending on the assumptions used in calculating the cost of a tonne of CO_2. Apart from nuclear power, whose external costs were underestimated, and waste incineration, where external costs were overestimated because all emissions were attributed to electricity rather than heat generation, hydroelectricity offers the lowest external costs, along with biomass and natural gas. The organisation of high-level nuclear waste management is contingent on decisions that will be taken after a parliamentary debate to be held in 2006; the major operators have already made financial arrangements to meet future obligations in this connection. Economic assessment work regarding energy should be pursued, and extended to renewables (e.g. the visual impact of wind turbines, emissions from wood burning), since *internalising the external costs of energy production and consumption could lead to substantial changes in energy choice*.

2. Energy Intensity and Efficiency and Decoupling

2.1 Trends in energy intensity

France's energy intensity, calculated as TPES (in tonnes of oil equivalent) per unit of GDP at 1995 prices and purchasing power parities, is 0.19 toe per USD 1 000. This is slightly above the OECD Europe average and below the OECD average (Figure 7.1), and it has fallen by 6% since 1990, reflecting a *decoupling* of supply from GDP growth.

In terms of trends in *energy intensity by sector*, transport has made less progress than other sectors. From 1973 to 2002, *industry* made the greatest improvement, though structural change was partly responsible. Industrial energy intensity,

excluding the steel industry, fell by 52%, and the steel industry's energy intensity fell by 75%. Further improvement has been recorded in the past few years in non-steel industry, and the downward trend in the *steel industry* has been maintained through gains in productivity and energy efficiency. In the *residential/commercial sector*, however, improvement in energy efficiency does not seem to be continuing over the long term. Indeed, energy intensity in this sector has recently increased. Meanwhile, energy efficiency in the *transport sector* has deteriorated, even in comparison to the situation in 1973. Overall consumption in the sector has risen by over 90% since 1973, and the private car fleet continues to grow.

2.2 Measures promoting energy efficiency and management

Recent improvements in energy efficiency and energy management are attributable partly to structural change but also to the introduction of incentives at national and EU level, including subsidies for purchases of energy-efficient appliances, energy audits, research and development, education on behaviour, labels, regulations and information measures.

Regulations on *energy management* were updated in line with the 30 December 1996 Law on Air and Energy Efficiency and several EU directives. Since 1998, decrees from *MINEFI* (e.g. on heating regulations, minimum performance criteria, renewal of public vehicle fleets and energy consumption labels) have been accompanied by action from the *Environment and Energy Management Agency* (ADEME) in the form of decision-making tools (such as energy diagnostics), pilot projects and financial instruments (e.g. to aid small business). In 2000 ADEME signed a partnership agreement (later extended to 2006) with Électricité de France (EDF) on energy demand management and efficient uses of electricity. Also in 2000 the government set up a network of neighbourhood Energy Info Points, serving individuals, small firms and local authorities, as part of the National Energy Efficiency Improvement Programme. Funding for energy management has primarily gone through ADEME, whose budget for this area increased 13-fold between 1998 and 2002 to EUR 120 million before being cut back to EUR 98 million in 2003.

Industry's recent success in improving its energy efficiency seems to be due to a combination of regulatory, fiscal and voluntary measures. One factor was a decision-making assistance programme launched in 1998 and aimed primarily at *small and medium-sized business and industrial firms* (SMEs and SMIs), with aid from regional consultancy support funds and ADEME. Another was the establishment in 1999 of the Energy Management Investment Guarantee Fund, offering guarantees of up to 70% on loans for this purpose taken out by SMIs. Since 1 January 1991 exceptional depreciation has been offered to firms acquiring equipment designed to save energy or produce

renewable-sourced energy before 31 December 2006. After discussions with MINEFI and the Ministry of Ecology and Sustainable Development (MEDD), the companies with the highest energy consumption in France formed the Enterprise Association for Greenhouse Gas Reduction and undertook a *voluntary commitment* to reduce their GHG emissions and energy consumption starting in the second quarter of 2002.

In the *residential/commercial* sector, most recent regulatory measures are based on EU regulations. The EU directives on energy consumption labelling for *household appliances* (refrigerators, freezers, washing machines, dryers and dishwashers) have been transposed into French law, as have directives setting minimum environmental performance levels. The *housing* stock in France is relatively old (65% of residences predate 1975) and hence poorly insulated. At the current rate of renovation and replacement of old property (1% per year), the pre-1975 housing stock will not all be upgraded until around 2050. All regulations on minimum energy efficiency of new buildings had been revised by 2000. The 2002 EU directive aimed at improving the energy efficiency of buildings is being transposed into French law. It applies to *new and existing buildings* and includes minimum performance requirements, energy performance certification upon change of owner or tenant and display of energy consumption information in public areas. These measures should make possible a 75% reduction by 2050 in primary energy consumption averaged for the entire housing stock, i.e. to about 125 kWh/m^2. An income tax credit of up to 40% is available as from 1 January 2005 for purchases of renewables-based energy-producing equipment installed at the taxpayer's main residence, and also for purchases of thermal insulation material and heat control devices between 1 October 2001 and 31 December 2005.

The *transport* sector performs more poorly than other sectors in terms of energy efficiency. An example is the low compliance with Article 24-III of the 1996 Law on Air and Energy Efficiency, which says that for government agencies and certain other public bodies operating fleets of more than 20 vehicles, 20% of the vehicles they buy when renewing the fleet must be powered by electricity, natural gas or liquefied petroleum gas (LPG). A 2001 survey of 400 establishments deemed representative of those covered by the provision indicated that "clean" vehicles accounted for 20% or more of the fleet in only 18% of the establishments. Though many tax incentives have been introduced favouring "clean" vehicles (exceptional depreciation, lower taxes on natural gas fuel and a special butane-propane LPG mix, département tax exemptions for alternative vehicles, exemption from the tax on company cars, VAT exemption for alternative fuel, reimbursement of the consumption tax on LPG and natural gas fuel and an income tax credit for LPG, natural gas or hybrid fuel), the number of such vehicles has not grown. Accidents involving natural gas-powered vehicles have undermined consumer confidence in that technology.

In draft legislation on energy policy the government has proposed a series of measures designed to bring demand growth gradually under control. The aim is to reduce energy intensity by 2% a year on average between 2010 and 2015. A proposed system of *energy savings certificates* would aim to enable energy savings in all areas of consumption at a minimal cost to society, notably by exploiting "diffuse" reserves of potential savings involving many players. The tradable certificates would be issued to any legal person who voluntarily achieved energy savings above a given threshold in kWh. Energy suppliers would have to either finance energy-saving measures by their customers or buy certificates from other parties. Such a market is a good idea in principle, but care needs to be taken to ensure that it works and, in particular, that the planned system of fines (EUR 0.02 per kWh) is truly dissuasive.

Energy management efforts in the past have generally waxed and waned with oil prices. Major efforts were made after the oil shocks of 1974 and 1979; the momentum dropped with the countershock of 1986 and grew again in 1999-2000 on renewed oil market tensions. From an environmental standpoint, it is clear that *the type of energy most compatible with sustainable development is energy that does not have to be produced*. Energy conservation is an effective means of reducing emissions of conventional pollutants and GHGs: substantial reserves of potential energy savings can often be exploited at lower cost than supply-related measures. It would be advisable to *strengthen energy-saving measures* and significantly enhance their role in comparison with policies oriented towards supply, while monitoring their cost-effectiveness. The measures to increase energy efficiency in buildings are a step in the right direction, as is the planned system of energy savings certificates, provided that the administrative costs of setting up the system do not outweigh the benefits. *Research and development* efforts, on the other hand, are still little concerned with energy conservation and strongly focused on nuclear power. In 2001, for example, 83.1% of the EUR 441.6 million in government R&D spending related to energy production was devoted to nuclear energy, 7.7% to fossil fuels, 4.1% to renewables and 2.7% to energy conservation. Moreover, energy savings could be made longer lasting if energy prices were raised to reflect the long-term scarcity of the natural resources consumed worldwide.

3. Renewable Forms of Energy

3.1 General framework

France has *many assets* in terms of renewable energy resources: major hydro-electric generating capacity, some of Europe's largest forested areas, plentiful wind power potential, vast areas (especially in the overseas départements) where certain renewables are cheaper to produce than electricity, and recognised expertise in photovoltaic and thermal solar technology.

In 2003 France produced 17.3 Mtoe of renewables, one of the highest amounts recorded by any OECD Europe country. In terms of TPES shares, however, *renewables account for 6.4%*, slightly above the EU15 average, and their share has remained fairly stable since the late 1980s. *Biomass* accounted for 69% of this production and *hydroelectricity* for 29%, dominating the field; next come geothermal power (0.74%), tide power (0.27%), mechanical wind energy and wind power (0.16%) and thermal solar power (0.11%). Since 1997, overall energy production from renewable sources has increased. Renewables account for over 12% of total electricity production, with hydro plants contributing 11%, biomass 0.60%, tide power 0.10% and wind power 0.06%.

The share of energy produced from renewable sources is likely to rise, first because the 2001 EU directive on the promotion of electricity produced from renewable sources sets a particularly ambitious objective for France of *21% by 2010*. Second, although there is no EU objective for thermal renewables (wood and wood waste, solid urban waste, biogas, geothermal power, thermal solar power), the draft framework law on energy sets a *national objective of increasing heat production from renewable sources by 50%*, from 11 Mtoe to 16 Mtoe, by 2015 (Box 7.1).

3.2 Measures to promote renewable energy sources

Principles

France bases its promotion of renewables on several *principles*. The first is to avoid systematically developing all renewable sources, at any price, without planning, in all applications and with many *government subsidies*, since some energy sources are far from competitive economically with traditional energy sources. The second is to promote the use of renewables in applications where their clean performance has made or soon will make them *competitive* with rival energy forms, which requires action to structure the supply side in close collaboration with local authorities. The third, concerning sources with little chance of becoming competitive in the short term, is to support *R&D efforts* aimed at reducing their deployment costs. Fourth is the assumption that support for renewables is economically warranted by the need to *correct negative externalities resulting from fossil fuel use*. Public support for renewables temporarily offsets these externalities either through guaranteed purchase prices or action to increase quantities (calls for bids).

Electricity and renewables

Concerning *electricity produced from renewable sources*, the 2000 Law on Modernising and Developing Public Electricity Service requires both EDF and any

Box 7.1 **Renewable energy sources: non-electricity technologies**

To meet the *national objective* of increasing heat generation from renewable sources by 50% by 2015, France has a policy of support for renewable forms of energy not used in electricity generation: thermal solar, wood, geothermal resources and biogas.

In the overseas départements, *solar water heaters* would be competitive with electric water heaters if electricity were sold at the local production cost rather than at the tariff charged in Metropolitan France under the re-equalisation principle. In 1996, to address this effect, ADEME, EDF and local authorities joined forces in the "20 000 solar water heaters" initiative to subsidise solar water heating. The programme proved successful in that 50 000 solar water heaters are now installed and prospects for growth remain good. In Metropolitan France, ADEME launched the *Sun Plan* initiative in 2000 with the aim of installing 30 000 individual solar water heaters, 15 000 m^2 of solar panels on residential/commercial buildings and 500 solar collectors (integrated systems providing residential heating and hot water) annually to 2006.

Following the wood energy and local development plan (1994-98), a new and more ambitious *Wood Energy Programme* (2000-06) was launched. With EUR 10 million a year in investment aid, it applies to all regions and is part of the planning contracts between the central and the regional governments and those between the central government and ADEME. The plan is to install 1 000 new heating units. Of course, wood burning generates VOC emissions.

Geothermal resources, which are particularly abundant in the Île-de-France region, can supply district heating networks but require major long-term investment. The long-term guarantee fund set up to support committed owner-operators in this region has been extended. Around 7 500 new residences had been connected by the end of 2002. The challenge for 2006 is to connect an additional 30 000 residences in the Île-de-France to geothermal heat networks.

With regard to *biogas*, production in France of viable gaseous fuel (methane) from fermentation of organic material amounts to over 600 000 toe per year, mainly at landfills but also using sewage treatment sludge and municipal, agricultural and food processing waste. Only 150 000 toe per year of this output is actually used, however. The 2000-06 planning contract between the government and ADEME provides, therefore, for an increase of 20 000 toe per year and electricity production of 2 TWh. ADEME and its partners have started to prepare a national biogas programme to focus on production of methane from organic, animal and household waste, food processing waste and sewage sludge, along with landfill biogas.

non-nationalised utilities to sign *electricity purchase contracts*, upon request, with producers generating power on French soil from renewable sources in facilities with maximum capacity of 12 MW. Ten orders have been issued defining the conditions of purchase of electricity produced by such facilities. They relate to wind power,

hydroelectricity, household waste, photovoltaics, cogeneration, biomass and geothermal power, among others, and guarantee prices under the public service obligation. Additional costs incurred by EDF or a non-nationalised utility are reimbursed by all participants in the electricity sector through the Electricity Production Public Service Fund, which in 2003 amounted to mandatory purchases worth EUR 1.05 billion. If installed capacity does not grow on its own to the production level required under a multi-year electricity investment programme specifying expected capacity for various forms of power generation by 2010, *calls for bids* can be issued to build plants with capacity over 12 MW. Three calls for bids were issued in 2003: one for biomass (200 MWe) and biogas (50 MWe) generation, one for an offshore wind farm (500 MWe) and one for an inland wind farm (1 000 MWe). Environmental criteria do not seem to have played a role in determining the point above which there was an obligation to purchase output or initiate a bidding procedure. Since the addition of a purchase obligation for facilities of less than 12 MW capacity, demand from wind turbine manufacturers has skyrocketed, with the risk of wind farms cropping up all over the country.

At the end of 2003 installed *wind power* generating capacity was 250-300 MW (of which 100 MW was added in 2003), compared with a goal of 10 000 MW by 2010. The January 2003 Law on the Gas and Electricity Markets and Public Energy Service clarified the review of wind farm projects by making most of them subject to building permit applications, environmental impact assessments (EIAs) and public enquiries. Nevertheless, development of wind power has run up against, on the one hand, opposition from environmental NGOs objecting to wind farms' impact on landscape and decrying what they call "wind power anarchy", and, on the other, administrative constraints that penalise the industry despite an attractive tariff (EUR 0.083 per kWh for the first five years). Applications to build, for instance, must be approved by 23 to 27 government agencies before reaching the prefect for final approval. In the Rhône-Alpes region, the ADEME office has set up a one-stop shop where all these procedures are handled. To allow the wind power industry to develop, administrative procedures should be streamlined, negotiations on grid connection prices made more transparent and closer collaboration with environmental NGOs on wind farm siting encouraged.

In several countries, the system of guaranteed prices imposed on electricity companies is increasingly criticised as unlikely to adequately reflect the downward trends in production costs attributable to the use of technologies that are now mature. The question is controversial primarily because of the politically negative impact of a reduction in government aid to renewables. Thus, countries including the United Kingdom, Italy and Belgium, noting the inefficiency of the systems they had previously put in place, have shifted towards use of market mechanisms in the form

of *quotas* for electricity produced from renewable sources, coupled with a *green certificate market*. These mechanisms offer two major benefits: straightforward quantity management through gradual adjustment of quotas, and incentives to reduce costs. France could draw useful lessons from the experiments now under way.

Conclusion

Overall, renewables offer *many benefits to society*: they contribute to energy supply security and diversification of energy production, help protect the environment, create local economic activities and jobs and play a part in regional development. However, in view of the *collective cost of encouraging the diffusion of renewables*, it would be advisable to *assess the policies regarding government support* (expenditure and taxation) pursued thus far to verify whether they are cost-effective and to compare the costs of renewable energy programmes with those of equivalent programmes in energy conservation.

4. Environmental Management and Safety in Energy Production

4.1 Conventional energy production

Major energy production facilities (conventional thermal power plants, industrial combustion plants, urban district heating plants, refineries) are covered by the *classified installation regime* (licencing, EIA, hazard assessment) and in most cases not by Seveso directives, unlike gas storage and transport facilities, for example.

The prefect of the département, in accordance with regulatory provisions determined by the inspectors of classified installations, awards a *permit*, stating the reasons for its approval and making it public. Major energy production plants must comply with EU directive 96/61 on integrated pollution prevention and control, which sets out the basic rules for integrated permits (covering emissions to air, water and land, waste generation, use of raw materials, energy efficiency, noise, hazards, accident prevention and risk management), relying on the best available techniques not entailing excessive cost. They must also comply with directive 88/609 on large combustion plants. Because the latter directive did not impose particularly restrictive limit values, the orders issued by prefects have not, on the whole, been particularly stringent.

Emissions of airborne pollutants from such plants have *fallen dramatically*. Emissions from electricity generation have declined by 72% since 1990, those from oil refineries by 30% and those from the extraction and distribution of gas fuels by 78%. NO_x emissions from electricity generation have fallen by 26%. NMVOC emissions from the extraction and distribution of liquid fuels have declined by 52%.

In future, under the new EU directive on *large combustion plants* (2001/80/EC), all plants built before 1987 with a rated thermal input of at least 50 MW will have to reduce their annual emissions by 1 January 2008, in three stages: SO_2 emissions must be cut by 40%, then 60% and finally 70%, from 1980 levels, and NO_x levels by 20%, 40% and 20%. Emission limit values will have to be set for SO_2, NO_x and dust particle emissions from newer plants. The EU directive on emission ceilings (2001/81/EC) requires national emission ceilings to be introduced no later than 2010 for SO_2, NO_x, VOCs and ammonia. Enhanced enforcement in the field through the creation of new posts for inspectors should help with the implementation of these directives.

4.2 Nuclear power plants

Basic nuclear installations (reactors, plants where radioactive substances are fabricated or processed and storage units or repositories for radioactive substances) are subject to licensing procedures (Decree 63-1228) and technical regulations. A *special law* on nuclear activities is under preparation.

Before *building* a basic nuclear installation, the operator must submit a licence application and preliminary safety report to the ministers at MEDD and MINEFI, which forward them to the other ministers concerned (Interior, Health and Agriculture). The review of the application is overseen by the Directorate-General for Nuclear Safety and Radioprotection (DGSNR); it includes a public enquiry (during which the results of an environmental hazard and impact assessment must be presented) and a technical study. After consulting the relevant technical bodies, the ministers at MEDD and MINEFI decide whether to issue a licence. Once it has been decided to build a facility, at least four successive licences are required before pressurised water reactors can go on line, in a procedure that concludes with ministerial approval of *final commissioning*. Discharge permits for *liquid and gaseous waste and reactor coolant samples* from nuclear power plants are not issued by prefects (as is the case with conventional thermal power plants) but require ministerial orders issued by the three ministers with oversight, at MEDD and the ministries dealing with energy and health.

The *Nuclear Safety Authority (ASN)* employs 141 inspectors to monitor some 125 basic nuclear installations, including the 58 reactors at EDF's 19 nuclear power plants, the research centres of the Atomic Energy Commission and around 15 nuclear fuel fabrication and reprocessing plants operated by the AREVA group. In 2002 basic nuclear installations in France reported one level 2 incident and 124 level 1 incidents on the seven-level International Nuclear Event Scale. Level 1 involves a reactor anomaly beyond the authorised operating regime. Level 2 incidents are overexposure

Box 7.2 **Radioactive waste management**

Radioactive waste is mainly generated by *nuclear power plants* (which accounted for 64% of the total in 2002) and spent fuel reprocessing plants. The remainder stems from the use of radionuclides in *hospitals*, *universities* and some *non-nuclear industries*. Each year French nuclear power plants produce *a total of around 1 200 tonnes* of spent fuel. About 800 tonnes are sent to the La Hague reprocessing plant to recover plutonium and uranium. The plutonium is used in making new mixed oxide (MOX) fuel assemblies. The uranium is stabilised for storage. Of the remaining waste, fission products are vitrified and metallic components (fuel rods and nozzles) are compacted. Some 400 tonnes per year of untreated waste is stored pending a decision whether to recover the plutonium or dispose of it as waste. Some radioactive waste from other countries (e.g. Germany, Japan) is also reprocessed at La Hague and re-exported to the country of origin.

Per capita generation of radioactive waste in France amounts to around 1 kg per year, i.e. 60 000 tonnes. Some 90% of this (in volume terms) is classified as low level or very low level, with a short half-life (around 30 years) and accounting for only 1% of the radioactivity involved. High-level waste with a long half-life, on the other hand, accounts for just 1% of the waste volume but 90% of the radioactivity. *Each type of waste* requires a processing type and disposal solution matching its radioactivity level, half-life, volume and/or nature. Comparison can be made of i) existing stocks and forecast volumes for 2010 and 2020 (Table 7.3); and ii) progress in various types of waste management technology being developed for final disposal (Table 7.4). No final decision has yet been reached with regard to certain types of waste.

Radioactive waste management is governed by a 1975 law based upon the *principles* of preventing waste production, holding waste producers responsible for final disposal, assuring traceability of waste and informing the public. A 1999 order sets out the *technical regulations* applicable to radioactive waste from basic nuclear installations: a waste study must be conducted for each site approved by ASN; appropriate disposal technology must be specified for each type of radioactive waste and be licensed on the basis of EIA and public information or consultation; and waste tracking systems must assure their traceability. Most nuclear plant operators had completed an initial version of the waste studies by the end of 2000. The studies had to be revised to make them fully acceptable.

The *management of highly radioactive waste with a long half-life* is governed by a 1991 law known as the Bataille Law, which establishes three lines of research: *separation and transmutation of long-life radioactive elements*; options for *deep geological disposal*; and *packaging and long-term surface storage*. The National Evaluation Commission, which regularly assesses all such research, is of the view that the studies being performed over 1991-2006 should produce a range of management solutions to be submitted for decision at a parliamentary meeting to be held in 2006 in accordance with the Bataille Law.

Box 7.2 **Radioactive waste management** *(cont.)*

Substantial efforts have been made in recent years to improve *public information*, notably including the establishment in 2002 of DGNSR. Despite these efforts, regular opinion polls conducted by the CREDOC research centre show that the French public still considers the production and storage of radioactive waste to be the main disadvantages of nuclear energy. Moreover, 59% of respondents in January 2003 said they most trusted consumer associations and environmental NGOs to give them objective information about radioactive waste processing and disposal, and 29% trusted scientific researchers, as opposed to the National Radioactive Waste Management Agency (ANDRA, with 18%) or local officials (15%). In reaction to this lack of confidence, a draft law on transparency and safety regarding nuclear materials contains provisions aimed at substantially enhancing public information and the transparency of nuclear activities, and at guaranteeing the quality and reliability of information.

of a worker, significant spread of contamination or incidents involving major failures of safety provisions. These two levels entail no off-site consequences. In ASN's view, while EDF has made progress in managing collective dose levels during maintenance operations and, more generally, has improved its working methods, the final result in safety terms is less satisfactory. To judge from EDF's experience in 2003, which included a succession of minor incidents during delicate operations such as reactor restarts, a more rigorous approach is required in day-to-day reactor operation. No serious (level 3) incidents or accidents (levels 4 to 7) have occurred in any basic nuclear installations in France.

For the future, with the licensed lifetime of current installed capacity being extended from 30 years to 40, EDF intends to maintain a high level of quality in maintenance and safety operations, and has made the applicable standards and limits more stringent. To support this aim, EDF has signed a long-term progress and development charter with 13 professional organisations representing its sub-contractors and associated trade bodies, amounting to 600 firms under subcontract that employ 20 000 people. Trade unions have expressed fear that the quality of maintenance will decline. To the general public, however, the main area of concern as regards the nuclear industry is the production and storage of radioactive waste (Box 7.2).

Table 7.3 **Radioactive waste stocks in 2002 and forecast volumes**

(m^3 of conditioned equivalent)

Type of waste	Existing volumes in storage in 2002	Forecast: volumes in storage in 2010	Forecast: volumes in storage in 2020
High level	1 639	2 521	3 621
Intermediate level, long half-life	45 359	50 207	54 509
Low level, long half-life	44 559	46 581	87 431
Low/intermediate level, short half-life	778 322	913 900	1 196 880
Very low level	108 219	247 981	515 991
Total	978 098	1 261 190	1 858 432

Source: ANDRA, Radioactive Waste and Recyclable Material in France: Summary of the 2004 National Inventory.

Table 7.4 **Radioactive waste: existing disposal options**

	Very short half-life	Short half-life	Long half-life
Very low level	Management by radioactive decay	Dedicated surface storage Recycling	Dedicated surface storage Recycling
Low level	Management by radioactive decay	Surface storage (Aube storage centre)[a]	Dedicated subsurface storage (studies in progress)
Intermediate level	Management by radioactive decay	Surface storage (Aube storage centre)[a]	Sectoral studies in progress[b]
High level	Management by radioactive decay	Sectoral studies in progress[b]	Sectoral studies in progress[b]

a) Apart from tritiated waste and encapsulated sources (studies in progress).
b) Pursuant to Article L. 542 of the Environment Code (Law of 30/12/91).
Source: ASN.

5. Institutional Integration

5.1 Objectives

The *objectives of French energy policy* have not changed since the Environmental Performance Review published in 1997: energy supply security, energy competitiveness to benefit firms and consumers, respect for the environment, and solidarity as regards the regions and the disadvantaged. The main implementation tools are a policy of energy management relying on efficient use of energy resources; promotion of diversification in energy types and geographical sources, with particular emphasis on new and renewable forms of energy and new supply sources; technical support for installed nuclear capacity and retention of the nuclear option at least until existing power plants need to be replaced (between 2015 and 2020); international co-operation; and regulation of energy enterprises

A *national debate on energy sources* was organised during the first half of 2003 by MINEFI's Directorate-General for Energy and Raw Materials in collaboration with NGOs, elected officials and citizens. Its conclusions, published in a *white paper* on energy sources in November 2003, showed that the four objectives of energy policy remained clear priorities. The debate and white paper provided the basis for the *draft framework law on energy* brought to the Parliament in 2004. Objectives in the bill include reducing final energy intensity by an average of 2% per year between 2010 and 2015; setting up a system of energy savings certificates; and, also by 2015, increasing *heat production from renewable sources* by 50% through tax measures and direct aid (Box 7.1).

Most *environmental protection NGOs* viewed the national debate as *disappointing*, maintaining that they had been unable to express their opinions because no real discussion took place on the key issues, particularly the role of nuclear power in France. Hence, they decided to organise separately what they termed a "genuine debate" and a conference on "Energy: another policy is possible in France".

In 2001 and 2002, the *institutional framework for nuclear safety and radioprotection* was reorganised, resulting in a closer link between nuclear safety and radioprotection activities. The reorganisation involved the establishment of DGSNR (also called ASN) and its technical advisory body, the Institute for Nuclear Safety and Radioprotection, which assists with independent safety evaluation of solutions proposed by researchers and provides ASN with technical expertise. This institutional reform undeniably represented progress in taking account of risks related to nuclear power plants, for those who work in them and the general public.

5.2 Planning and programming

France has a long tradition of planning in the energy sector and of *forecasting and public policy evaluation*. During the review period, the Planning Commissariat, the Economic Analysis Council and the Parliamentary Office for the Evaluation of Scientific and Technological Choices published several energy forecasts and evaluations that provide highly useful input to the decision-making process.

The *multi-year investment programme* for electricity, introduced under the 2000 Law on Modernising and Developing Public Electricity Service, is intended to promote balanced development of national production in terms of the mix of primary energy sources, the choice of production techniques and the geographic location of projects. It is based in particular on regional public energy service plans drawn up in accordance with the 1999 Framework Law on Regional Land Use and Sustainable Development.

The aim of these plans is to maximise the *contribution of regional bodies* to national energy policy and sustainable regional and local development. In particular, they are intended to define objectives for the next 20 years on exploitation of local renewable energy resources and on energy efficiency. As such, for regional bodies they serve as a *local energy policy and planning instrument*. The plans are to be revised no more than a year after the planning contracts between the government and the regions expire. Unfortunately no one has been formally made responsible for disseminating or promoting them. They are initiated by elected officials who believe in the merits of energy management and renewable energy sources, as is the case in the Rhône-Alpes region.

5.3 National Programme to Combat Climate Change

According to the EU burden-sharing agreement, France *must stabilise its GHG emissions* at 1990 levels by 2008-12. The government has unveiled an ambitious long-term target of *reducing GHG emissions by 75%* (the "factor 4" objective) by 2050. Because of the share of nuclear power in its energy supply mix, France has one of the lowest per capita GHG emission ratios among OECD countries, but the trend is towards an overall increase in emissions of around 58 Mt of CO_2 equivalent by 2010, compared with 1990.

The *electricity industry* in France is responsible for a relatively small share of CO_2 emissions, accounting for 9% of energy-related emissions in 2001. Thus France has less scope than many other countries for reducing emissions by switching from coal to gas. Greater efforts to improve *energy efficiency*, combined with a significant increase in electricity produced from *renewable sources*, could help limit or reduce emissions, however.

The *transport sector* generates the largest share of energy-related CO_2 emissions at 37%, and transport emissions are steadily rising. Containing or reducing them is a real challenge and it will be difficult to control them without a dramatic change in technology or behaviour. Progress will depend upon demand management, modal shifts from road to rail or inland waterways, further increases in energy efficiency and vehicle fleet renewal, and technological advances to develop vehicles with low GHG emissions. It will also depend upon the implementation of urban air quality plans and their effective integration with traffic and mobility management.

The *residential/commercial sector* is another major source of GHG emissions. Here France could draw upon significant potential for increased energy efficiency. Energy savings certificates could be useful instruments if administrative costs can be minimised.

France adopted an ambitious programme against global warming, the National Programme to Combat Climate Change, in 2000 and extended it under the third UNFCCC National Communication published in November 2001. A *Climate Plan*, scheduled for release in the autumn of 2003, was postponed several times but finally adopted in the summer of 2004 (Chapter 8).

6. Integration through the Market

6.1 Prices

One objective of French energy policy is to be able to supply energy to firms and households under optimum conditions of quality and cost. Residential and industrial *electricity* prices are lower than in other major EU countries, particularly for industry. The price of *natural gas* for industrial use is slightly above the EU average, whereas that for household use is around the EU average. The price of *oil*, for both industry and households, is lower than the EU average (Table 7.5).

Electricity rates are the same throughout France, and the 2003 Law on the Gas and Electricity Markets and Public Energy Service established the principle of close harmonisation of *natural gas* prices, stating that tariff differentials cannot be greater than the differences in costs for connecting to the natural gas grid. The law also provides continued access to energy supplies for *persons in difficulty*.

6.2 Energy taxation and the environment

Energy taxation is based primarily on a system of harmonised excise duties at EU level. The *national oil product tax (TIPP)* is the main tax on energy products, representing, at EUR 24 billion a year, some 11% of government revenue and 1.8% of

GDP. Fuel taxes account for over 90% of this revenue. Heavy and domestic fuel oils are also taxed, but at lower rates, and in certain non-combustion uses they are tax exempt. Natural gas use (except as motor fuel) is subject to the national tax on natural gas consumption, whose revenue amounts to some EUR 120 million. These taxes may be waived for social reasons (e.g. in the case of heating in residential blocks) or environmental ones (e.g. for cogeneration plants). In general *the taxes are not directly linked to environmental externalities* of fuel use, notably CO_2 emissions, which contribute to global warming. Although *coal* is the most polluting fuel, it *is not taxed* and thus enjoys an indirect subsidy.

Oil product taxes

The TIPP primarily affects transport, since it is mainly applied to *motor vehicle fuel*. Fuel taxes in France are high compared with North America, but lower

Table 7.5 **Energy prices in selected OECD countries**, 2003

	Electricity		Oil		Natural gas	
	Industry (USD[c]/kWh)	Households (USD[d]/kWh)	Industry[a] (USD[c]/tonne)	Households[b] (USD[d]/ 1 000 litres)	Industry (USD[c]/10^7 kcal)	Households (USD[d]/10^7 kcal)
France	0.045	0.123	209.3	427.2	229.1	506.4
Canada	. .	. .	211.3	468.1	210.1	391.0
United States[e]	0.049	0.087	195.8	369.8	222.7	365.0
Japan	0.115[f]	0.150[f]	237.9	342.3	357.0[f]	935.1[f]
Germany	0.049[f]	0.146[f]	. .	360.3	187.9[h]	407.6[h]
Italy	0.113[f]	0.195[f]	220.7[f]	991.0	. .	. .
United Kingdom	0.055	0.111	203.1[f]	291.4	161.9	337.7
OECD Europe	0.059[f]	0.140[f]	. .	458.9	157.4[h]	400.4[h]
OECD	0.062[g]	0.110[g]	205.7[f]	442.2	162.0[f]	380.0[f]
France/OECD Europe (%)	*63*[f]	*87*[f]	. .	*93*	*107*[h]	*102*[h]
France/OECD (%)	*56*[g]	*109*[g]	*85*[f]	*97*	*106*[f]	*130*[f]

a) High-sulphur oil.
b) Light fuel oil.
c) At current exchange rates.
d) At current purchasing power parities.
e) Electricity prices exclude tax.
f) 2002 data.
g) 2001 data.
h) 2000 data.
Source: IEA-OECD.

than those in some European countries (e.g. Germany, Italy, United Kingdom) (Figure 2.3). The difference between taxes on diesel fuel and those on petrol has led to strong growth in the share of diesel-powered vehicles in the fleet. In 1998 the government committed itself to reducing the differential to the European average within seven years. After two years of reduction the process was suspended in the autumn of 2000 following the sharp increase in oil prices, then was resumed in early 2004 with an increase in diesel tax of EUR 0.03 per litre. This measure is a step in the right direction but should be extended to heavy goods vehicles. While fuel taxes are an effective weapon against CO_2 emissions, they are ill-suited to internalising environmental externalities linked to the use of vehicles whose characteristics vary widely according to where they are used (town or country) and their technical specifications. The taxation of transport therefore needs to evolve towards making *tax bases more closely related* to infrastructure use, location of vehicle use and the environmental characteristics of vehicles (Chapter 2).

Some *tax exemptions or reductions* granted in certain sectors are hard to justify in terms of marginal social cost. Road haulage companies and public transport companies benefit from a partial rebate of TIPP. Public transport operators are exempt from TIPP on LPG and natural gas, which entail lower CO_2 emissions. Aviation and marine fuel is also exempt, under international agreements. Diesel fuel used by farmers is taxed at the rate for household fuel oil, which is one-seventh the normal diesel tax.

Other fiscal measures

Aside from the TIPP, only the tax on motorways, payable by motorway concession holders, is directly based on number of kilometres travelled. Other *taxes on land transport* are generally based on vehicle type, such as the axle tax and the registration tax on all vehicles, which is set at regional level and depends on the car's taxable power rating. These taxes serve to internalise the costs of transport infrastructure, congestion, road safety problems and local pollution. The abolition in the autumn of 2000 of the annual road tax on private cars, for which different categories had been introduced the year before to take account of vehicle emission characteristics, illustrates the lack of policy consistency in this area (Chapter 2).

Electricity is subject to taxes on extra-high-voltage transmission line pylons (revenue of EUR 134 million in 2001), hydroelectricity (EUR 299 million in 2001) and basic nuclear installations (EUR 130 million in 2000), as well as a levy to finance the Electricity Production Public Service Fund, the general tax on polluting activities (for air pollution) and charges levied by the river basin financial agencies. In addition, the optional local infrastructure tax, revenue from which goes to municipalities and départements (EUR 1.2 billion in 2001), is based on the amount of electricity

consumed. It could have unwelcome effects, since the higher consumption is, the more revenue the relevant local authority receives. The hydroelectricity tax is completely at odds with the energy policy goal of encouraging the use of renewables.

Some *positive fiscal measures*, including tax credits and exceptional depreciation, are aimed at encouraging the production and use of renewables, as well as investment in energy savings (e.g. purchases of insulation or boilers). Revenue amounted to EUR 100 million in 2002.

Desirable changes

The energy tax regime has evolved over several decades and now displays many *inconsistencies* with current objectives. Some environmentally damaging aspects of energy taxation (e.g. related to conventional pollutants and GHGs), such as the tax differential between petrol and diesel, tax exemptions or reductions for hauliers and the hydroelectricity tax, should ultimately be revised or discarded. To initiate such a reform, it would be advisable to set up a *green tax commission* reporting to the Prime Minister, as in some other OECD countries.

6.3 Deregulation

The introduction of competition in electricity and natural gas services is a major change, resulting from EU market liberalisation. MEDD has started to examine the *environmental effects of liberalisation* with regard to the three main impacts generally expected: lower prices, reduced inefficiency and modified choices of factors of production. Consideration should also be given to the environmental impact of changing the legal status of EDF and Gaz de France to that of private company and, at a later stage, opening their capital to outside investment. Measures should be taken to control the volatility of shareholdings by providing long-term guarantees to ensure, for example, that the polluter pays principle is applied and that nuclear power plants will be properly dismantled without generating hidden costs in the energy sector.

8

INTERNATIONAL CO-OPERATION*

Features

- Climate protection
- Maritime safety and port state control
- International trade and the environment
- Development financing (ODA, Global Environment Facility)

* This chapter reviews progress over the last ten years, and particularly since the previous Environmental Performance Review of 1997. It also reviews progress with respect to the objective "global environmental interdependence" of the 2001 OECD Environmental Strategy. Results relating to international nature conservation commitments are considered in Chapter 4.

Recommendations

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

- implement measures (e.g. taxation, emission permit trading, other flexibility mechanisms) to enable fulfilment of *Kyoto Protocol commitments*, paying particular attention to the transport sector;
- continue to increase *inspections to assure compliance with IMO standards* in vessels calling at French ports;
- pursue the establishment of port plans for *processing ships' waste* and cargo residues by assuring their co-ordination at the national level, including through better co-operation among ports and use of existing equipment, as well as harmonising charges and identifying additional facilities needed;
- encourage the preparation of management and recovery plans, in the context of EU negotiations, and continue adjusting the *fishing fleet capacity* to take account of fishery resources;
- ensure that environmental assessment of projects supported by *export credits and credit guarantees* is consistent with recommended practices (international standards or equivalent standards set by the host country);
- continue to increase the level of *official development assistance* and the emphasis placed on environmental projects.

Conclusions

Since 1996 France has continued to play an active role in the preparation of *global agreements* on environmental protection and sustainable development, in the development of international environmental law and, more generally, in the strengthening of international environmental governance. Climate change, biodiversity, water and the marine environment are explicit priorities. Regarding *climate change*, France has stabilised its greenhouse gas emissions in accordance with the UNFCCC. It has partly decoupled CO_2 emissions from GDP growth, mainly through emission reductions in the industry and energy sectors and the growing share of services in the economy. CO_2 emissions per unit of GDP are low. France is on its way towards meeting its Kyoto Protocol targets. Concerning *transboundary pollution*, France has more than met its objectives under the Convention on Long-range Transboundary Air Pollution and its Oslo, Sofia and Geneva Protocols, considerably reducing its emissions of NO_x, SO_x and NMVOCs. It has helped strengthen European and global *agreements on maritime safety* and regularly monitors its exclusive economic zone,

devoting significant institutional and material resources to combating accidental marine pollution. France is engaged in a proactive policy to eliminate illicit discharges from ships. An innovative protection zone for cetaceans, partly in the open sea, has been created in the Mediterranean, as well as an ecological protection zone. France ranks eighth among OECD countries and first among the G7 countries in terms of *official development assistance* as a proportion of GNI (0.41%). It seeks to integrate environmental considerations into its aid projects and is a leading contributor to multilateral environment funds. It has taken several practical steps since 2000 to better integrate environmental considerations into decisions on applications for *export credits and credit guarantees*.

However, France could improve its results with regard to the fulfilment of several *international environmental commitments*. Measures in connection with the greenhouse effect must be strengthened; the efficiency of the measures could be reviewed, especially as regards the contribution of the transport sector and the balance between internal measures such as taxation and external measures such as emission permit trading in Europe and other flexible mechanisms. Between 1996 and 2002 France did not meet its international commitments as a *port state*: fewer than 25% of foreign vessels were inspected in French ports to verify compliance with IMO standards, though this was corrected in 2003. French *ports* do not have sufficient facilities for receiving ships' waste and cargo residues. Some *fish stocks* are below safe biological limits, notably in the North Sea; recovery plans (e.g. for cod and hake) are in place. Recent objectives for transboundary air pollution under the Gothenburg Protocol and the EU directive setting national emission ceilings will require new domestic measures. Reductions of *nitrogen emissions* from agriculture will have to be stepped up if France is to meet its commitments with regard to the North Sea and the EU nitrates directive. While France generally manages to reconcile its *international trade with its environmental commitments*, progress is needed as regards border controls.

♦ ♦ ♦

1. Objectives

Many environmental problems encountered in France have a *significant international dimension*. In Europe there is extensive interdependence, both in environmental matters such as air pollution, watercourse pollution and the conservation of marine resources, and in economic matters, since almost two-thirds of France's foreign trade is with European countries. As a founding member of the European Union, France has helped construct a body of *EU legislation* that ensures

that French environmental laws are consistent with those of its trading partners. On the world stage, France continues to play an active part in environmental protection through substantial contributions to the Global Environment Facility (GEF), the French Global Environment Facility and the Multilateral Fund for the Implementation of the Montreal Protocol. France has wielded real influence in the drafting of *global agreements* on environmental protection and sustainable development and in the development of international environmental law. It has sought to help improve *international environmental governance*, in particular through its support for the establishment of a United Nations Environment Organization.

As well as transposing EU environment directives into French law, France has signed and ratified many regional and global multilateral environmental agreements (Reference II). Climate change, water, biodiversity, the oceans and chemicals are priority issues. Performance will be assessed here in relation to: i) international objectives and commitments on climate change, transboundary air pollution, water, marine pollution, conservation of marine resources, trade and the environment and official development assistance; and ii) the recommendations made by the OECD in the *1997 Environmental Performance Review*:

- ratify and implement recent international agreements on environmental protection, particularly those relating to VOCs, EIAs and the protection of the North-east Atlantic;
- deepen cross-border co-operation with neighbouring countries and find a solution to a few practical and legal problems related to the environment that remain in border regions;
- strengthen measures to reduce non-point-source discharges of heavy metals and nitrates into the Channel and the North Sea;
- assess the progress of the national climate change programme; set quantitative targets for greenhouse gas emissions beyond 2000 in the context of international negotiations and define strategies to meet these targets in each sector, notably by stepping up efforts to improve energy efficiency;
- contribute to the development of environmental law with a view to improve its implementation and to adopt international regulations on civil liability;
- carry out regular reviews of all international commitments with regard to environmental protection to determine to what extent they have been implemented in France and whether measures taken to meet international obligations are adequate;
- make more information available on France's international environmental protection activities and work to improve awareness of these activities in other countries.

2. Climate Protection

2.1 Trends and current climate policy

France has committed to *stabilising greenhouse gas (GHG) emissions* at their 1990 levels under the United Nations Framework Convention on Climate Change (UNFCCC). In accordance with the *Kyoto Protocol* it has also committed to maintaining total emissions (CO_2 equivalent) of the so-called Kyoto gases, CO_2, CH_4, N_2O, HFC, PFC and SF_6, at their 1990 levels in 2008-12, in the context of the EU burden-sharing agreement, which provides for an 8% cut by the EU as a whole. In terms of *CO_2 intensity* (measured per unit of GDP), the French economy ranks third among the OECD countries (Reference II) and first among the G8 countries (Figure 2.1). One contributing factor to the low CO_2 emissions per unit of GDP is the predominance of hydroelectric and nuclear power, which account for about 90% of French power generation (Chapter 7).

Emission trends

National emissions of greenhouses gases were not only stabilised between 1990 and 2002 but even decreased by 1.9%. This favourable result is largely due to lower emissions of GHGs other than CO_2, and, in particular, reductions from manufacturing, where emissions fell by 19% due to process changes, a switch from combustion to electricity and reduced N_2O emissions in the chemical industry; from power generation (emissions down by 28% with eight nuclear reactors coming on stream); and from waste processing (a 7% reduction due to less landfilling and more methane capture). Methane emissions from farming also fell sharply. These reductions offset a rise in CO_2 emissions of about 5% coming mainly from transport and construction. CO_2 emissions have been only weakly decoupled from economic growth (Figure 2.1).

National climate change programme

Since 1993, France has drawn up *successive national programmes to counter the greenhouse effect*. The *National Programme to Combat Climate Change* (PNLCC 2000) assumes the economy will grow 2.2% per year over 2000-10 and considers the impact of *three types of measures*: those currently in place or approved, those planned or under consideration, and those that could be envisaged in the longer term.

The *first category* ("existing measures scenario", Table 8.1) comprises about 100 low-cost or "no regrets" measures, very similar in style to those applied until 1997: regulation, energy conservation in construction and in certain electricity uses, improved operation of transport systems. It is difficult to calculate an economic

value per tonne of CO_2 avoided through these measures because many are justified on grounds having nothing to do with the greenhouse effect. The estimated aggregate effect of "existing measures" is *11 million tonnes of carbon (MtC) per year* to 2010, representing 66% of the projected national reduction (Table 8.1).

The *second category* ("additional measures scenario", Table 8.1) includes *economic measures* (affecting prices of fossil fuels in particular) and incentives, such as environmental taxes (Chapter 5) and the EU emission trading programme that began in January 2005, to encourage economic agents to take GHG emissions into account in production and consumption decisions. Implementing these measures would result by 2010 in an energy tax differential, based on the choice of a benchmark price of EUR 20 per tonne of CO_2 equivalent, at a level comparable with that of other EU countries and the EU directive on energy tax harmonisation. Estimates indicate these "additional measures" will achieve a further reduction of up to *5.5 MtC per year* to 2010, or 33% of the projected national reduction, which would almost meet the national target (Table 8.1).

Table 8.1 **GHG emissions: 2000 national climate programme scenarios**, 1990-2020

($MtCO_2$)

	Actual emissions[a]		No measures scenario[b]		Existing measures scenario[c]		Additional measures scenario[d]	
	1990	1999	2010	2020	2010	2020	2010	2020
CO_2	385.4	405.1	467.0	549.2	427.6	490.7	398.4	410.8
CH_4	63.3	57.6	75.4	76.1	46.7	44.7	46.6	44.8
N_2O	88.7	72.4	111.6	114.5	77.0	79.0	62.9	64.9
F gases	7.6	9.1	34.0	43.3	26.0	32.5	11.1	10.9
Total	545.0	544.2	688.0	783.1	577.3	646.9	519.0	531.4
Change in relation to 1990 (%):								
All GHGs		*–0.1*	*26.2*	*43.7*	*5.9*	*18.7*	*–4.8*	*–2.5*
CO_2		*5.1*	*21.2*	*42.5*	*10.9*	*27.3*	*3.4*	*6.6*

a) Excludes emissions associated with changing use of land and forests.
b) Assumes application of measures in effect at 31 December 1999.
c) Assumes application of all measures in effect or adopted at 31 December 1999.
d) Assumes application of additional measures, planned or under consideration (PNLCC 2000 and national plan to improve energy efficiency).
Source: Third National Communication of France to the UNFCCC.

The *third category* includes *longer-term structural actions* affecting supply, especially in sectors where the long-term trend in emissions is upwards, such as buildings/services, energy production and, most notably, transport.

2.2 Evaluation and outlook

PNLCC 2000 was an important milestone, since France is one of the few EU countries to have already reduced national emissions from their 1990 levels, not counting sequestration by carbon sinks. However, the *second review of the plan* in late 2002 showed that, leaving aside the introduction of EU emission trading in January 2005, many "additional measures" listed in the plan's second category had either not been implemented (e.g. the carbon tax) or were only partially applied (e.g. the fuel tax rise, suspended in 2000 when oil prices went up). The review concluded that France would find it hard to meet its Kyoto objectives for 2008-12 without further measures. Accordingly, an *additional 2004 Climate Plan* was introduced in July 2004 (Box 8.1). For the long term, the government has announced a "Factor 4" target of cutting GHG emissions by 75% by 2050.

Until recently, PNLCC 2000 implementation almost entirely involved *measures within France*, which risked generating higher than necessary reduction costs. The 2004 Climate Plan (Table 8.2), in contrast, should not only enable France to fulfil its international GHG reduction commitments but also pave the way for the use of *flexible mechanisms*, economic "co-development" mechanisms that further development in beneficiary countries while helping limit the cost of actions to combat climate change for donor countries. In addition, in July 2004 France notified the European Commission of its *national allowance allocation plan* under Directive 2003/87/EC establishing the GHG emission allowance trading programme. Prepared in co-operation with the industrial sectors concerned, the plan determines the total amount of allowances to be allocated and how this should be done (allocations by sector and by site). It covers the industries that account for the bulk of France's industrial emissions (iron and steel, cement, lime, glass, paper, ceramics, tiles and bricks) and energy production (power generation, refineries, district heating). It caps their CO_2 discharges at 126.3 MtC per year for three years (2005-07), 1.8% less than the 128.6 MtC they would emit per year without reductions. In December 2004 the plan was extended to all combustion plants generating more than 20 MW, and restricted sector allowances were decreased by 1.5 MtC. The EU trading programme went into effect on 1 January 2005.

While implementation of PNLCC 2000 and the 2004 Climate Plan will continue, it might be appropriate not only to take into consideration available information about the costs and benefits of projects carried out in other European OECD countries in recent years in the context of joint implementation and the clean development

Box 8.1 **2004 Climate Plan**

The 2004 Climate Plan reasserts the objective of stabilising GHG emissions by 2010. It particularly emphasises *five proposals*:

- gradual incorporation of *biofuels* into the range of transport fuels on offer, eventually quintupling their use so as to achieve the EU-recommended objective of a 5.75% share by 2010;
- introduction of a *tax credit* for installation of equipment that helps reduce GHG emissions, such as solar water heaters, when new housing is built;
- widespread deployment of *energy labelling*, providing information about the energy performance of products on the market, from air conditioners to offices and housing units;
- nationwide and EU consultation on the introduction of a merit rating (*bonus-malus*) system, based on energy labelling, on purchases of new cars, rewarding those who buy vehicles with low CO_2 emissions and penalising those who buy vehicles with high CO_2 emissions;
- allocation of over 70% of the dividends of motorway companies to such *non-road projects* as the high-speed train system, the Seine-North canal and the Lyon-Turin rail tunnel.

Projections of the effects of the 2004 Climate Plan measures suggest that France would meet its Kyoto commitment. The figures for national emissions are 4% higher in the plan than in France's Third National Communication to the UNFCCC Secretariat (Tables 8.1 and 8.2) due to correction of errors concerning the inclusion of emissions from refining and from flights to overseas territories. The 2004 Climate Plan, in projecting compliance with France's Kyoto commitment, includes the effects of carbon sinks, the clean development mechanism and joint implementation (Table 8.2).

mechanism, but also to reassess the *indirect advantages* of investment designed to reduce GHG emissions in France. For example, investment in more energy-efficient technology generates many benefits, such as energy saving, reduced CO_2 emissions and reductions both in SO_x, VOC and PM_{10} emissions and in their effects on human health and ecosystems. Thus such investment would help in fulfilling commitments under the Long-range Transboundary Air Pollution (LRTAP) Convention and the EU emission ceilings directive. Moreover, assumptions related to long-term oil price trends would benefit from a more diversified approach.

There is considerable inertia in the *transport* sector, where GHG emissions in 2002 were 23% higher than in 1990, and the *buildings* sector, with a 19% rise; between them they account for 45% of national emissions. Trends in both sectors are cause for

concern. In road transport, private vehicles are responsible for 60% of GHG emissions and trucks and light-duty utility vehicles for 40%, with growth likely to remain strong. Taxes in the transport sector as a whole have decreased. To address transport emissions, a proposal was made in 2004 for a merit-linked or *bonus-malus system* for vehicles, differentiating them according to their CO_2 and fine particulate emissions, with a bonus of EUR 800 for the least polluting vehicles and a penalty of around EUR 1 500 for most vehicles. It was felt that such a tax should be considered in an EU context.

Table 8.2 **Greenhouse gas emissions: impact of the 2004 Climate Plan**

($MtCO_2$)

	Emissions 1990	Emissions 2002	Emission trend to 2010	2004 Climate Plan measures	Emissions 2010 with 2004 measures
Air conditioning[a]	–	–	–	10.2	–
Transport	121.5	149.5	175.1	16.3	154.8
Buildings	89.5	97.4	116.6	11.7	99.9
Industry	141.2	115.0	118.3	10.8	107.3
Energy	80.6	68.6	87.8	16.8	71.0
Waste	15.9	14.7	13.0	0.5	12.5
Agriculture, forests	116.1	108.6	108.1	5.6	105.7
Subnational climate plans[a]	–	–	–	0.4	–
Total	564.7[b]	553.9	618.9	72.3	550.8
"Kyoto" total[c]					546.6[c]

a) These two lines refer to actions but not emitting sectors. Their effects on 2010 emissions are divided among the other lines.
b) Differs from the total given in the Third National Communication because errors were corrected concerning inclusion of emissions from refining and from flights to overseas territories.
c) Includes 3.2 $MtCO_2$ from carbon sinks, clean development mechanism and joint implementation.
Source: 2004 Climate Plan.

3. Transboundary Pollution

3.1 Air pollution

Transboundary exchanges of air pollution contribute to acidification and eutrophication in Europe and have long been a cause for concern in France and other European countries. A recent study showed that 58% of SO_x deposits and 53% of NO_x deposits within Metropolitan France came from other countries, especially Spain and the UK.

France, meanwhile, "exports" 60% of its SO_x emissions, mainly to Germany, Belgium, the Mediterranean and the North Sea, and 61% of its NO_x emissions, mainly to Germany, Italy, Spain and the sea. With regional emissions of SO_x falling significantly in Europe since 1990, sulphur deposition in France has decreased by 24%. But despite a fall in regional NO_x emissions, nitrogen deposition in France has increased by 10%.

Table 8.3 **Performance on international commitments to reduce atmospheric emissions**

			Commitments		Results	
			Target period	Target change (%)	Observation period	Change (%)
LRTAP CONVENTION[a] AND PROTOCOLS[b]						
SO_2	Helsinki	(1985)	1980-93	*–30*	1980-93	*–66*
	Oslo	(1994)	1980-00	*–73*	1980-00	*–80*
		(1994)	1980-05	*–76*	1980-02	*–83*
	Gothenburg[c]	(1999)	1990-10	*–68*	1990-02	*–60*
NO_x	Sofia	(1988)	1987-94	*0*	1987-94	*–5*
	Sofia Dec.	(1988)	1980-98	*–30*	1980-98	*–22*
	Gothenburg[c]	(1999)	1990-10	*–54*	1990-02	*–29*
NMVOC	Geneva	(1991)	1988-99	*–30*	1988-99	*–34*
	Gothenburg[c]	(1999)	1990-10	*–57*	1990-02	*–38*
Ammonia	Gothenburg[c]	(1999)	1990-10	*0*	1990-02	*0*
Heavy metals	Aarhus	(1998)				
Cadmium (Cd)				1990 level	1990-02	*–39*
Lead (Pb)				1990 level	1990-02	*–95*
Mercury (Hg)				1990 level	1990-02	*–54*
Persistent organic pollutants	Aarhus	(1998)				
Polycyclic aromatic hydrocarbons				1990 level	1990-02	*–15*
Dioxins/furans				1990 level	1990-02	*–78*
Hexachlorobenzene				1990 level	1990-02	*+5*
EU DIRECTIVE (NATIONAL EMISSION CEILINGS)						
SO_2			1990-10	*–72*	1990-02	*–60*
NO_x			1990-10	*–57*	1990-02	*–29*
NMVOCs			1990-10	*–58*	1990-02	*–38*
Ammonia			1990-10	*0*	1990-02	*0*

a) Geneva Convention on Long-range Transboundary Air Pollution (1979).
b) The date in brackets is the date at which the protocol was opened for signature.
c) France has signed but not yet ratified the Gothenburg Protocol.
Source: EMEP; CITEPA; OECD.

France has achieved or even exceeded most of its *targets for reducing atmospheric emissions* of SO_x, NO_x and NMVOCs under the LRTAP Convention and its protocols (Table 8.3). However, it has failed to meet its Sofia Declaration target, like most other signatories. The EU emission ceilings directive sets limits on SO_x, NO_x, VOC and ammonia emissions to 2010 at levels comparable with those of the Gothenburg Protocol, which France has signed but not yet ratified (Table 8.3). Additional measures will be necessary if these targets are to be met, in particular concerning emissions of NO_x from road transport, ammonia from farming and SO_x from coastal shipping.

France recently ratified the Aarhus Protocols on *persistent organic pollutants (POPs) and heavy metals* and is well on the way to achieving its targets, except the one on hexachlorobenzene (Table 8.3). The share of waste incineration in total emissions of dioxins and furans fell from 73% in 1990 to 65% in 2001. Progress in the iron and steel industry during that period reduced its contribution to total emissions from 20% to 12%. Heavy metal emissions also fell, by 96% for lead, 34% for cadmium, 37% for chrome, 49% for mercury and 23% for nickel, largely thanks to efforts in the industry and energy sectors.

3.2 Water pollution

France has long co-operated with its neighbours to prevent, control and reduce the cross-border impact of pollution and protect the aquatic environment, including the marine environment. In accordance with the recommendation of the 1997 OECD review, France has continued to strengthen co-operation with neighbouring countries with a view to protecting transboundary watercourses. Bilateral and multilateral co-operative arrangements exist, in the framework of international commissions, for *Lake Geneva, the Sarre, Moselle and Rhine* rivers and, more recently, the *Meuse and Escaut* (Reference II.B), mainly with the aim of reducing nitrogen discharges. France's existing policy is sufficient as regards the provisions and orientations of the Helsinki Convention, as well. An example of France's approach regarding transboundary water issues is the co-operative agreement for sustainable and integrated management of the Meuse international river basin, concluded with Germany, Belgium, Luxembourg and the Netherlands.

4. Marine Pollution

France has *one of the world's biggest maritime domains (11 million km^2)*, in the Atlantic, Pacific and Indian Oceans. Metropolitan France has *long coastlines* on the North Sea, the Channel, the Atlantic and the Mediterranean. Its coastal areas, defined as the maritime cantons, make up over 7% of the territory of Metropolitan France and account for 13% of the population.

Concerning marine pollution, France is a signatory to the *Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)*, the MARPOL Convention, the Paris Memorandum of Understanding on Port State control, the Barcelona Convention for protection of the Mediterranean and the Declarations of the North Sea Conferences. It plays an active part in the regional seas programmes of the United Nations Environment Programme (e.g. under the Barcelona, Nairobi and Cartagena conventions). In 2003, on the initiative of France and Spain, the European Union adopted or fast-tracked adoption of provisions comparable to those of the United States concerning control of maritime traffic and vessels (Box 8.2). This has led to major advances of global significance within the framework of the World Trade Organization (WTO).

4.1 Pollution from land-based sources

Land-based activities, both inland (such as agriculture and industry) and coastal (such as port facilities, aquaculture and municipalities) contribute to marine pollution. Despite progress in controlling such sources of pollution, much still needs to be done with regard to municipal waste water and, above all, *nitrogen pollution of agricultural origin*, associated with intensive livestock and crop farming (Chapter 3). The European Court of Justice condemned France in 2002 for insufficiently applying the nitrates directive (91/676/EEC) and for contributing to eutrophication in the Channel and North Sea. The Seine, for example, discharges 100 000 tonnes of nitrogen into the Channel every year, two-thirds of it of agricultural origin. Designated nitrogen-vulnerable areas were extended in 2003, mainly in the coastal départements on the Channel and North Sea (Chapter 3).

In the framework of the *North Sea Conference*, France has committed to at least halving its discharges of nitrogen and phosphorus. The initial period, 1985-95, was extended to 2005 for France and other countries. The data reported to the Fifth North Sea Conference (a 72% reduction in river discharges of phosphorus and a 28% reduction for nitrogen over 1990-99) do not include discharges from sewage plants and industrial facilities.

4.2 Maritime safety and oil spills

The density of maritime activity in France's exclusive economic zone (EEZ) entails a *high risk* of oil spills and damage to marine environments. The level of maritime traffic in the *Channel and North Sea* is among the world's highest: some 45 000 ships per year, including over 5 000 tankers carrying 240 million tonnes of oil products. In the *Mediterranean*, heavy local traffic is compounded by shipping from

Box 8.2 **Two sets of "Erika" measures**

The European Union (EU15) is the *world's biggest trader in oil products*, accounting for some 27% of the world total. About 90% of this trade is seaborne, amounting to some 800 million tonnes a year. The imports come mainly from the Middle East and North Africa, while exports (of North Sea oil) outside the EU are mainly to North America.

Around 70% of *tanker transport* related to this trade passes along Atlantic and North Sea coasts, the rest going through the Mediterranean. In addition, many other tankers transit EU waters without putting into port, representing additional volume and hence greater risk of oil spills. Two of the EU's five biggest oil ports are *in France (Marseille and Le Havre)*. Demand for oil products is expected to rise, and tanker movements with it.

On 12 December 1999, the *Erika* broke in two 70 kilometres off the French coast, spilling over 10 000 tonnes of heavy fuel oil and causing a major environmental disaster, mainly affecting Brittany. Two packages of EU legislation were passed after the Erika wreck, mainly on France's insistence.

The *first set of measures* is designed to tighten port control of vessels by the country to which the port belongs. The measures as planned include systematic inspection of single-hulled vessels more than 15 years old and a ban on the most dangerous vessels from EU countries' waters if they have already been detained by port authorities more than twice. Classification organisations have to meet stricter conditions to be certified, while an accelerated timetable was introduced for *scrapping single-hull vessels*, according to age and tonnage, between 2005 and 2015.

The *second set of measures* is designed to tighten control of maritime traffic, in particular by introducing "black boxes" on ships and designating ports of refuge in all coastal countries. There is also provision to set up a compensation fund (in addition to the International Oil Pollution Compensation Fund, which has a ceiling of EUR 184 million) for maritime oil pollution and to establish a European Maritime Safety Agency.

the Middle East, the Black Sea and Central Asia: some 8 000 vessels transport chemical and oil products through the French EEZ each year. Although the number and volume of accidental oil spills has fallen significantly from a peak of 750 000 tonnes in 1979, the wrecks of the *Erika* in 1999 and the Prestige in 2003 showed that France's coastal areas are still at risk.

The accidental marine pollution response plan, POLMAR, initially set up in 1978 and overhauled in 1997, manages oil pollution and discharges of substances harmful to the marine environment. Maritime prefects can trigger the *POLMAR* plan

in their region, giving them access to resources of local authorities, private resources, requisitioned resources, resources under contract and an emergency response fund managed by the Ministry of Ecology and Sustainable Development (MEDD) to cover the cost of labour and equipment. In Metropolitan France, antipollution resources for POLMAR plans are stocked in eight *storage and emergency response centres*, at Dunkirk, Le Havre, Brest, Saint Nazaire, Le Verdon, Sète, Marseille and Ajaccio. Other stocks of antipollution equipment can also be mobilised. In all, some 55 km of booms, 172 skimmers, 241 pumps, 574 storage tanks, 426 beach cleaners and 1 500 m^3 of dispersants are available through sea and land POLMAR plans, including stocks belonging to ports, emergency services and private co-operatives.

Under the Bonn Agreement, France carries out regular *air surveillance* of its EEZ and co-operates with the seven other North Sea countries in carrying out monthly aerial inspections of offshore oil and gas production and monitoring areas of dense maritime traffic. The aircraft used for detecting marine pollution are under the control of the customs authorities. This surveillance is intended to detect oil slicks and their sources if possible, help evaluate risks, control the spread of pollution and guide clean-up equipment to the area concerned. Each year, France detects around 55 environmentally harmful incidents of illegal discharges of oil or accidental pollution. France has stepped up its coastal surveillance since the Erika wreck. Particular watch is kept on the most at-risk vessels (one every two days on the Atlantic coast), which must stay beyond the 200-mile limit.

4.3 Port responsibilities

Waste management in ports

Seven state-owned *autonomous ports* in Metropolitan France (Dunkirk, Le Havre, Rouen, Paris, Nantes-Saint Nazaire, Bordeaux and Marseille) handle 80% of maritime freight. Marseille is France's biggest port and the largest on the Mediterranean, handling 95 million tonnes of freight a year, making it Europe's third busiest. Many vessels under various flags call at French ports.

Under the MARPOL Convention, in two "special zones" covering the *Mediterranean* and the waters of *north-western Europe* (including the North Sea and the Channel), all discharges of waste and residues from vessels are banned. More generally, parties to the convention have to ensure that adequate facilities are available for receiving oil residues and mixtures at oil terminals, repair ports and other port installations. A 1998 *inventory of port facilities* for receiving ship waste showed that a majority of ports could not directly handle four types of waste: ballast water, wash residue, rusty waste and sludge from propulsion products. The vast

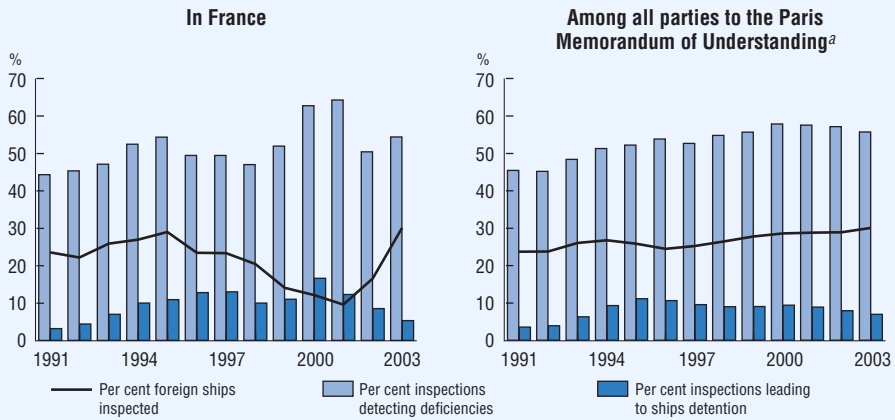
majority of French ports have opted for partnerships with licensed private operators specialising in waste collection and processing. Nevertheless, when the 1998 inventory was being prepared, shippers complained that: i) as it is difficult to get a lorry to come alongside oil or chemical tankers, pumping rates are very low; ii) it is difficult to get service on weekends; iii) operations involving waste have to be conducted separately from commercial operations; and iv) information about the availability of collection services is scarce.

The *EU directive on port reception facilities* for ship-generated waste and cargo residues (2000/59/EC) was not transposed into French law until 2004. The directive applies to all vessels, including fishing and recreational craft, whatever their flag. Each port was to draw up a *waste management plan* by the end of 2002, but not all of them did so. A 2001 report from the Conseil Général des Ponts et Chaussées (France's main civil engineering body) and the Environmental General Inspection Service concluded that, while the essential infrastructure exists in commercial ports, *better use of the equipment* is necessary and some ports need additional facilities, especially for barges. To meet the directive's requirements and also benefit from economies of scale through closer co-operation among ports, France should continue to draw up *port plans* for the management of ship-generated waste and cargo residues and follow them up so as to achieve better co-operation, make the most of existing equipment, harmonise fees and identify what further facilities are required. The directive specifies that *fees* for using waste reception facilities should take account of the costs of waste processing and disposal (in addition to the share of these costs included in port dues). The 2001 report highlighted the progress still to be made, given the wide variety in fee structures; in some cases no charge is made for certain services (for example, if there is a commercial transaction or if the ship is in for repairs), while in others the charge may deter ships from using them. Since the introduction of waste charges by a decree on 22 September 2003, pricing systems that comply with the directive are supposed to be put in place.

Port inspection of vessels

Between 1996 and 2002, France did not comply with its *international inspection commitments as a port state*. Under the Paris Memorandum and the 1995 EU Directive on Port State Control, the countries concerned must inspect at least 25% of foreign-flagged vessels calling at their ports to ensure that they comply with MARPOL standards. France did not meet this target between 1996 and 2002 (Figure 8.1). Indeed, between 1996 and 2001, the percentage of foreign merchant vessels inspected fell from 23.5% to 9.6%. Since the European Court of Justice condemned France on this point in 2002, the percentage of ships inspected has risen

Figure 8.1 **Port state control,** 1991-2003



a) Belgium, Canada, Croatia, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Russian Federation, Spain, Sweden and the United Kingdom.
Source: Secretariat of the Paris Memorandum of Understanding.

(15% in 2002 and 30% in 2003) and the 25% target has been met. This achievement reflects efforts to significantly increase inspection capacity at France's 15 *ship safety centres*. The *number of maritime inspectors*, which had fallen, has risen substantially since 2001. Some 85% of *vessels detained* by French port authorities following inspections are general cargo vessels or bulk carriers. Oil spills affecting the French coast, such as those from the Erika and Prestige, have led to more tankers being detained. In 2003, for example, French inspectors carried out 1 746 inspections, reported failings on 951 vessels (54%) and detained 95 (5%).

France has the world's 28th largest merchant fleet (4.8 million tonnes deadweight), with 210 ships carrying 92 million tonnes of freight a year. The French fleet is in 17th position (out of 22) on the Paris Memorandum "*white list*", indicating a *high level of compliance with MARPOL standards*. Of the 95 inspections of French vessels carried out worldwide in 2000, only three resulted in detention.

5. Conservation of Marine Resources

The *French sea fishing industry* produced 720 000 tonnes of fish, crustaceans, algae and shellfish in 2003, including 24 000 tonnes from overseas territories, generating sales of EUR 1.3 billion and employing 21 500 sailors (3 500 of them in overseas territories). Over two-thirds of the catch of the metropolitan French fleet is taken in the north-east Atlantic, followed (by size of catch) by the western Indian Ocean (including tropical tuna), the tropical Atlantic and the Mediterranean (source of 7% of the catch). France ranks 11th among OECD countries in terms of volume of catch. *Average consumption of marine products*, which is rising, is 34 kg per year per inhabitant (in live weight equivalent), making France a net importer. Sea fishing accounts for less than 0.1% of GDP, and its *economic importance* varies considerably by region: 40% of the catch is landed in Brittany.

In EU waters, management of fishery resources in France's EEZ is part of the remit of the EU's *Common Fisheries Policy* (CFP). In the 2002 reform of the CFP, France supported three principles: i) preserving overall balance with regard to access, maintaining rules for access to coastal waters and keeping member states' quota allocations relatively stable; ii) aiming for sustainable management of resources by re-emphasising total allowable catch (TAC) and quotas as central to the CFP and supporting them through improved scientific knowledge, a multi-year approach and stepped-up controls; and iii) ensuring that fleet policy allows for vessel modernisation and replacement without increasing overall fishing capacity. In preparatory negotiations on the reform France was one of the "*fishing-friendly*" countries (with Spain, Portugal, Ireland, Italy and Greece), defending the second and third principles in particular.

5.1 Fleet management

The French fleet comprises 7 900 vessels (including 2 350 in overseas territories), most of them smaller boats of less than 12 metres. In an effort to *reduce overfishing*, the International Plan of Action for the Management of Fishing Capacity of the UN Food and Agriculture Organization (FAO) advises countries with an over-capacity problem to reduce fishing capacity and abolish subsidies that lead to overcapacity. Under EU multi-year guidance programmes, since the early 1990s France has taken steps to reduce fleet capacity. The fishing fleet of Metropolitan France fell, in power terms, from 960 686 kW at the end of 1997 to 910 532 kW at the end of 2002. In 2001 France took additional measures at national level to *reduce fleet capacity and fishing*, and continued this effort in 2003-04.

5.2 Conservation of fish stocks

The International Council for the Exploration of the Sea (ICES) considers some *North Sea* fish stocks to be outside safe biological limits. Most species sought by the French fleet are among those classified as overfished (cod, saithe, anglerfish, sole, langoustine, mackerel), though French vessels operate relatively little in the North Sea, taking 5-10% of the total catch. Stocks ranked by ICES as being in good condition are generally open-sea species such as sardine, sprat and tuna, the pressure being greater on coastal stocks. Following the 2002 CFP reform, measures to limit cod fishing in the North Sea were incorporated into a 2003 plan to reconstitute stocks, with restrictions being imposed on the time some fishing vessels could spend at sea.

France has also developed national *management instruments* that meet EU requirements, such as caps on scallop catches. It is very active in measures to combat the types of illegal fishing denounced by the FAO. It has concluded co-operation agreements, with Australia for example, and has developed a radar surveillance system around the Kerguelen Islands, where there is a particularly vulnerable stock of deep-water fish.

Fishing in the *Mediterranean* has particular characteristics as regards variety and density of users, target species and the absence of TAC or quotas except for red tuna. The forum for international co-operation to conserve its fish stocks is the *General Fisheries Commission for the Mediterranean*, which recently became a consultative body within the FAO. France is a member (other include Spain, Italy and Greece), and is responsible for budgetary, legal and procedural matters. The EU is also a member, by virtue of its resource management authority. Since 1990 France has also made its own national arrangements regarding resource conservation in the Mediterranean, based on a system of licences for different types of fishing (e.g. bottom trawling, midwater trawling, bottom seining, oyster dragging, drift netting, pair trawling).

5.3 Protection of marine ecosystems and mammals

Progress was made during the review period on the protection of marine ecosystems and mammals, including the proposal of 500 000 hectares of sea to be designated special areas under the habitats directive and the establishment of 13 nature reserves. The declaration, with Italy and Monaco, of a marine sanctuary for cetaceans in the Mediterranean, covering 87 500 km^2, is a significant innovation in international law, since it includes areas outside national jurisdiction and thus is a precedent for developing a global system of protected areas on the high seas (Box 8.3). France has launched and is co-financing an initiative to protect coral reefs in the Pacific (Chapter 4).

Box 8.3 **Sanctuary for marine mammals in the Mediterranean**

France, Italy and Monaco concluded an agreement in 1999 in Rome on creating a *sanctuary for marine mammals in the Mediterranean*. It took effect in France in 2002. In 2001 the Conference of Parties to the *Barcelona Convention* included the sanctuary in its list of special protection areas of Mediterranean interest. The agreement aims to maintain a state of conservation favourable to populations of marine mammals by monitoring them more closely, *enforcing fishing and pollution rules* more strictly, regulating tourist cetacean watching and providing information to the public and those using sea resources.

France has given *Port Cros National Park* the task of co-ordinating the players involved and carrying out scientific monitoring. Six working parties are studying different activities in connection with the sanctuary and planning the work programme, and will co-ordinate *contacts with the fishing industry*. A national sanctuary committee has been set up, and the parties to the agreement approved a management plan at their meeting in September 2004. France has offered to host the secretariat, which still has to be established.

Establishing a *sanctuary in the high seas*, with regulations applying not only to the signatories but also to Barcelona Convention and EU countries, is a *significant innovation* and a positive follow-up to recommendations in such international forums as the IUCN and the Convention on Biodiversity, seeking to *promote the development of a global system of protected high-seas marine areas*.

6. International Trade and the Environment

France has been very active in international negotiations on trade and environment in the General Agreement on Tariffs and Trade (GATT) and WTO. It generally manages to *reconcile its international trade with its environmental commitments*. Progress is still needed in some areas, however, such as border controls on ozone-depleting substances, hazardous waste, tropical timber and products derived from endangered species.

6.1 Ozone-depleting substances

Since 1996, France has *systematically applied EU legislation* and met the deadlines for phasing out ozone-depleting substances, though not early as it did in the 1980s when it was the world's second largest producer of CFCs. France stopped producing and using halons in 1994 and CFCs in 1996. While complying with EU legislation it remains the world's second largest producer of HCFCs, after the

United States, with output of 5 080 ODP tonnes in 2003, an increase of 117% since 1989. It is also the only EU country still producing the fungicide methyl bromide (1 010 ODP tonnes, 60% less than in 1991). Its production of carbon tetrachloride has been cut by 97% and that of methyl chloroform by 99%. In 2003 France ratified the 1999 Beijing Amendment to the Montreal Protocol, prohibiting international trade in HCFCs with certain countries and extending controls to the production of HCFCs and bromochloromethane. The same year it also ratified the Montreal Amendment, which provides for a system for licensing imports and exports of new, used, recycled and reclaimed controlled substances.

As in other countries, little information is available about French *controls and curbs* of illegal trade in ozone-depleting substances. Customs officers carry out checks (partly computerised) at frontiers. Fines may amount to as much as twice the value of the goods concerned and offenders can also be imprisoned for up to three years. UNEP terms illegal activity in France "moderately high" and says it often taking the form of illegal re-imports from Eastern Europe. An Environmental Investigation Agency survey in 2002 indicated that the EU ban on trade in or use of CFCs (EU Regulation 2037/2000) could still be circumvented since four out of 31 potential suppliers contacted anonymously in France offered to sell CFC-12.

6.2 Hazardous waste

Since 2000, France has *exported some 200 000 tonnes of hazardous waste per year*, over 90% of it to other European countries, including Belgium (50%), Germany (20%), the UK (10%) and Norway (10%). In accordance with EU Regulation 259/93/EEC on movements of waste, France prohibits almost all exports of waste for final disposal to non-EU countries (except Norway and Switzerland). Exported waste mainly originates in border regions, such as Alsace, Nord-Pas-de-Calais and Rhône-Alpes, and is shipped to nearby specialist recycling facilities.

France *imported 1.3 million tonnes of hazardous waste* in 2001, about 90% of it for recycling and the rest for final disposal. Most of the imports were from other EU countries, especially Germany and Belgium. The annual volume of hazardous waste *in transit* through France is unknown, since no information is available about compliance with prior notification procedures, customs inspections of waste shipments at frontiers or the imposition of penalties.

6.3 Hazardous chemicals

France ratified the 1998 Rotterdam Convention and applies the principle of *prior informed consent* (PIC) for exports of hazardous chemicals and pesticides that are

potentially harmful to the environment, especially *exports of hazardous chemicals* to developing countries. The EU directive on PIC requires: i) notification of intent to export chemicals that are banned or strictly regulated in the EU; ii) compliance with the optional PIC procedure laid down by UNEP and the FAO; and iii) packaging and labelling of chemicals in compliance with EU law. France has helped ensure that these practices are in general use.

In 2004 France became the 50th country to ratify the 2001 *Stockholm Convention on POPs*, enabling the pact to enter into force. It has already almost entirely fulfilled its obligations under the convention, having banned production and use of all substances covered and introduced regulations to reduce dioxin emissions. The national implementing plan still needs to be completed, however, to fill minor gaps in the legislation.

6.4 Tropical timber

France is one of Europe's *leading importers* of tropical timber (round wood, sawn wood, veneer, plywood), accounting for about 19% of EU imports. Imports have been stable. About 40% of plywood, 42% of veneer and 36% of round wood imported into France comes from tropical forests. France is the top EU importer of tropical round wood (450 000 m^3 in 2002) and the world's fourth largest. The imported round wood is mostly made into sawn wood and plywood. France's exports of tropical timber other than plywood are minimal.

The *Year 2000 Objective* of the International Tropical Timber Organization states that all tropical timber products traded internationally should come from sustainably managed forests. Complying with this commitment has proved very difficult in practice, and it is likely that most tropical timber and derived products imported into France do not meet this criterion. In 2004 MEDD proposed an action plan for tropical forests aiming to curb illegal imports of tropical timber by stepping up customs controls and ensuring that purchases by public authorities, which account for 25% of the tropical timber imported into France, come from certified forests. France has a larger expanse of tropical forest (8 million hectares, mostly in French Guiana) than any other industrialised country (Chapter 4).

6.5 Endangered species

France ratified the 1973 *Washington Convention* on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1978. CITES regulates or prohibits international trade (import, export and re-export) in certain endangered species and derived parts or products such as skins, furs, feathers, tusks, trophies, wood, flowers, art objects and prepared food products. Although the EU is not a party

to CITES, it sets the terms and conditions for applying CITES within its member states. EU regulations are stricter than CITES where transactions with third countries are concerned, but facilitate trade among member states. France's *own measures* on the protection of species present in their natural state on French territory (including the overseas territories) are stricter than CITES.

MEDD is responsible for general *oversight* of activities associated with CITES, while the National Natural History Museum is responsible for *scientific support*. Regional Environment Directorates (DIREN) handle applications for licences and certificates (36 284 applications in 2003). *Controls* are carried out by customs officers and officials from other agencies, such as the National Forestry Office, National Hunting and Wildlife Office, Higher Council on Fisheries, Life Sciences Directorate, police and gendarmerie and the national parks. French inspectors have taken part in EU-sponsored training relating to application of CITES and in training courses organised in France by the police, customs service and other enforcement agencies. French customs reported 514 offences in 2003, mainly in airports and ports, resulting in the interception of 6 475 specimens of endangered species: 554 live animals, 327 stuffed animals, 551 pieces of ivory, 2 602 shells and corals and 2 441 miscellaneous products derived from protected species. The live animals confiscated are mainly snakes and tortoises.

Despite these efforts, it could be helpful to: i) *increase the human resources* assigned to oversight, scientific support and inspection; and ii) increase the administrative and criminal *penalties* (potentially a fine of EUR 9 000 and six months' imprisonment) to make them more of a deterrent in comparison with the benefits that can be expected from illegal trading.

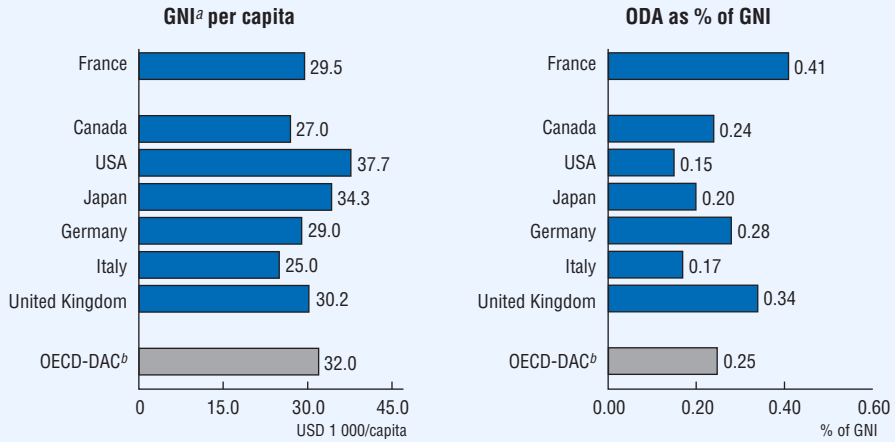
7. Financing of Development

7.1 Official development assistance

France devoted 0.41% of its gross national income (GNI) to official development assistance (ODA) in 2003 (Figure 8.2), putting it first among the *G7 countries in terms of ODA/GNI* and seventh out of the 22 OECD countries on the Development Assistance Committee (DAC). France's ODA declined between 1996 and 2000 but has increased since 2001, reaching EUR 5.9 billion in 2003 compared with EUR 4.4 billion (0.38% of GNI) in 2001. The medium-term EU objective is 0.35% of GNI and the UN objective is 0.70%.

The French Development Agency seeks to integrate *environmental considerations* into its general aid projects. The Ministry of Foreign Affairs estimates that at least 10% of programme and project aid is devoted to actions relating to water,

Figure 8.2 **Official development assistance,** 2003



a) Gross national income in USD at current exchange rates.
b) Member countries of the OECD Development Assistance Committee.
Source: OECD-DAC.

biodiversity, desertification, climate change, fishing and the marine environment. France gives particular priority to improving water conservation, waste and waste water processing, and transport and energy management. As well as contributing EUR 164 million over four years to the GEF, France has established a special *French GEF* (FFEM), with EUR 67 million over four years, to help finance environmental projects, especially in African and Mediterranean countries, with objectives similar to those of the GEF (Box 8.4, Table 8.4). Over 2002-03, France also contributed EUR 41 million to the Multilateral Fund for the Implementation of the Montreal Protocol.

The international community has recently made ambitious commitments, in the Millennium Declaration, the Monterrey Consensus and the Johannesburg Declaration, to reducing poverty and assuring access to drinking water, sewage treatment, health, food and energy. During the International Conference on Financing for Development in Monterrey (2002), France committed to increasing its ODA to 0.5% of GNI (around EUR 7.3 billion) by 2007 and 0.7% by 2012. At least half the additional resources are to aid Africa so as to help achieve the Millennium Development Goals.

Box 8.4 **Global Environment Facility**

France is one of the top contributors to the *GEF*, a multilateral fund set up in 1994 to help finance implementation of certain international environmental agreements, especially the Rio conventions on biodiversity and climate change. It is administered by the World Bank (financing), the United Nations Development Programme (technical assistance and institutional support projects) and UNEP (capacity enhancement, research and awareness-raising projects). The GEF is supervised by a 32-member board, including representatives from France and 13 other OECD countries. The GEF's budget is EUR 2.3 billion for 2003-06, with France contributing EUR 164 million.

The *French GEF* or FFEM, which has a budget of EUR 67 million for 2003-06, was set up exclusively to fund environmental projects. It was created after the Rio Summit and pursues objectives similar to those of the GEF but gives priority to African and Mediterranean countries. Between 1994 and 2002, FFEM began or completed 106 projects at a cost of over EUR 115 million (Table 8.4). Its aim is to contribute through subsidies to the funding of development projects that have a significant and lasting impact on major global environmental issues, such as biodiversity, climate change, international waters, the ozone layer, desertification and deforestation and POPs.

To assure *co-ordination between the GEF and FFEM*, the chair of the FFEM steering committee and the secretary-general of FFEM sit on the GEF board. Twenty-four of the 106 FFEM projects have also received GEF funding, though there are notable differences in the allocation of resources. FFEM devotes almost half its resources to sub-Saharan Africa, compared to less than 20% for the GEF. FFEM gives priority to economic and social development projects with global environmental aspects, focusing on *investment and practical achievements*, whereas the GEF may help finance protection or conservation projects with no economic and social development objectives and may also finance capacity enhancement, research and micro-projects. The average contribution of FFEM to the total cost of projects is 15%, with a ceiling of 50%, while that of the GEF is 30%, with no ceiling.

Under the Bonn commitments given by the EU and five countries, France has to meet some 10% of the total objective, representing a EUR 40.8 million per year increase in funding for climate change abatement from 2005, through the GEF, FFEM and DAC, and new channels. Between 1999 and 2003, France devoted some EUR 150 million a year of its ODA to climate change. Under the action plan of the New Partnership for Africa's Development, the French President recently announced a doubling of development aid for water supply and sanitation projects in Africa between 2003 and 2009. On the initiative of the African Development Bank, France is expected to host the first donor conference on this effort in the first half of 2005.

7.2 Other forms of assistance and public-private partnerships

France also uses *bilateral aid*, through "priority solidarity funds", to contribute to environmental and development objectives. For example, since its commitment to forgive bilateral debt as part of the initiative to help *highly indebted countries*, many debt forgiveness contracts concluded since 1999 have freed funds for natural resource management and regional development.

France recognises that the private sector has an important role to play in development and continues to support *public-private partnerships* and encourage the involvement of all stakeholders, including local authorities, NGOs and businesses, in co-operation for sustainable development in the developing world. Having actively contributed to work in Johannesburg on a new partnership instrument, the Type 2 initiative, France is a major participant in 25 such initiatives (10% of those listed on the UN Web site). It is also working with the UN Secretariat on a monitoring and evaluation methodology.

France continues to integrate environmental concerns into its export assistance policies and plays an active part in the OECD Working Party on *Export Credits*. It rapidly transposed the 2003 OECD Recommendation for government export credit agencies to meet certain environmental and transparency standards. COFACE, the *French export credit agency*, has in fact been implementing a policy since 2000 that complies with the OECD approach regarding environment and includes environmental impact assessments (EIAs) in the procedure for processing applications for

Table 8.4 **French Global Environment Facility activities**, 1994-2002

	Number of projects identified	Number of projects funded[a]	Amount[a] (EUR million)
Area			
Biodiversity	53	43 *(81)*	49.7 *(42.9)*
Climate change	26	26 *(100)*	29.8 *(25.8)*
International waters	13	11 *(84)*	17.1 *(14.8)*
Mixed (biodiversity/climate change)	14	14 *(100)*	19.1 *(16.5)*
Total	106	94 *(88)*	116.7 *(100)*

a) The figures in brackets are the percentage of identified projects funded (column 2) and each theme area's share of total funding (column 3).
Source: FFEM.

guarantees. COFACE has drawn up sectoral guidelines in three areas: thermal power stations, major dams and hydrocarbons. In 2003 it introduced *ex ante disclosure* of information about major projects, as the OECD Recommendation advises. For projects involving risks and costing over EUR 20 million, EIA results are made public 30 days before any decision is taken.

REFERENCES

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. Abbreviations

IV. Physical context

V. Selected environmental events (1996-2004)

VI. Selected environmental Web sites

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	9629	378	99	7713	270	84	31	79	43	338
Major protected areas (% of total area)	*2*	8.7	9.2	25.1	17.0	7.1	18.5	32.4	28.0	3.4	15.8	11.1	9.1
Nitrogenous fertiliser use (t/km^2 of arable land)		4.0	4.3	6.1	9.6	19.2	1.9	57.2	8.0	17.8	8.7	8.8	6.3
Pesticide use (t/km^2 of arable land)		0.10	0.14	0.18	1.36	1.47	0.07	0.63	0.21	1.11	0.14	0.13	0.06
FOREST													
Forest area (% of land area)		45.3	33.9	32.6	68.9	63.8	21.4	34.7	41.6	22.4	34.1	12.7	75.5
Use of forest resources (harvest/growth)		0.4	0.2	0.6	0.4	0.1	0.6	..	0.7	0.9	0.7	0.7	0.7
Tropical wood imports (USD/cap.)	*3*	1.6	0.2	2.2	10.7	6.1	4.0	3.4	0.4	24.2	0.3	3.8	1.4
THREATENED SPECIES													
Mammals (% of species known)		33.7	33.2	15.9	24.0	17.0	27.0	15.2	22.0	26.5	18.9	22.0	11.9
Birds (% of species known)		13.6	16.9	8.4	12.9	14.1	13.0	25.3	26.0	12.8	49.5	14.5	13.3
Fish (% of species known)		7.6	23.7	4.4	25.3	1.3	0.8	0.8	41.7	51.2	40.0	15.8	11.8
WATER													
Water withdrawal (% of gross annual availability)		1.5	15.5	19.2	20.3	35.6	6.2	..	4.2	45.1	11.9	4.4	2.1
Public waste water treatment (% of population served)		72	25	71	64	70	..	80	86	38	70	89	81
Fish catches (% of world catches)		1.1	1.5	5.4	5.1	2.2	0.2	0.6	-	-	-	1.6	0.2
AIR													
Emissions of sulphur oxides (kg/cap.)		76.3	12.2	49.4	6.7	20.4	142.6	17.2	4.5	14.7	22.2	4.5	16.4
(kg/1000 USD GDP)	*4*	2.7	1.6	1.5	0.3	1.6	5.7	0.9	0.2	0.6	1.5	0.2	0.7
% change (1990-early 2000s)		-27	..	-31	-14	-41	71	10	-55	-57	-88	-86	-64
Emissions of nitrogen oxides (kg/cap.)		78.4	12.0	63.9	15.8	24.4	86.0	51.8	24.8	28.1	32.3	35.5	40.5
(kg/1000 USD GDP)	*4*	2.8	1.6	2.0	0.6	1.9	3.4	2.7	1.0	1.1	2.2	1.4	1.7
% change (1990-early 2000s)		-6	18	-19	-2	23	20	48	-3	-20	-40	-31	-32
Emissions of carbon dioxide (t./cap.)	*5*	16.2	3.8	19.8	9.2	9.9	17.0	8.4	8.4	11.0	11.8	9.5	12.6
(t./1000 USD GDP)	*4*	0.58	0.47	0.62	0.37	0.66	0.68	0.43	0.33	0.44	0.85	0.36	0.52
% change (1990-2002)		20	28	18	12	99	28	42	16	7	-20	3	22
WASTE GENERATED													
Industrial waste (kg/1000 USD GDP)	*4, 6*	..	50	..	40	60	..	10	80	60	60	20	140
Municipal waste (kg/cap.)	*7*	350	320	730	410	380	690	400	510	480	280	660	480
Nuclear waste (t./Mtoe of TPES)	*8*	4.9	0.1	0.9	1.8	2.8	-	-	-	1.9	0.9	-	1.9

.. 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) IUCN management categories I-VI and protected areas without IUCN category assignment; national classifications may differ.

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	SLO	ESP	SWE	CHE	TUR	UKD*	OECD*
549	357	132	93	103	70	301	3	42	324	313	92	49	506	450	41	779	245	35042
13.3	31.5	5.2	8.9	9.5	1.2	19.0	17.1	18.9	6.4	29.0	8.5	25.2	9.5	9.5	28.7	4.3	30.1	16.4
12.3	14.9	6.6	7.6	7.9	33.4	8.1	x	27.3	11.4	5.8	4.1	5.6	6.0	7.0	12.1	4.6	20.0	6.3
0.44	0.25	0.31	0.17	-	0.20	0.79	0.67	0.77	0.09	0.07	0.63	0.25	0.23	0.06	0.35	0.09	*0.58*	*0.21*
31.6	30.2	22.8	19.5	1.3	9.4	23.3	34.5	9.5	39.2	30.0	36.9	41.6	33.3	73.5	30.8	27.0	11.6	34.4
0.6	0.5	0.6	0.5	-	0.7	0.5	0.5	0.6	0.5	0.6	0.8	0.5	0.5	0.7	0.8	0.5	0.6	0.6
6.8	1.8	2.8	0.1	2.8	11.2	7.1	-	15.6	3.6	0.3	17.6	0.1	6.2	2.2	0.6	0.5	2.7	4.0
19.0	41.8	36.4	71.1	-	6.5	40.7	51.6	15.6	3.4	15.7	17.7	22.2	26.3	22.4	33.8	22.2	*21.9*	..
19.2	29.2	13.0	18.8	42.7	21.8	18.4	50.0	26.2	7.7	14.5	13.7	14.4	25.5	19.1	42.6	6.7	*14.2*	..
7.6	31.3	24.3	32.1	-	33.3	29.0	27.9	31.1	-	14.5	22.9	24.1	52.9	16.4	44.7	9.9	*11.1*	..
17.5	20.2	12.1	4.7	0.1	..	32.1	3.7	9.9	0.7	18.6	15.1	1.4	34.7	1.5	4.8	17.0	*20.8*	*11.5*
79	93	56	32	33	73	63	95	98	73	55	42	53	55	86	96	17	*95*	*64*
0.7	0.2	0.1	-	2.1	0.4	0.3	-	0.6	2.9	0.2	0.2	-	1.2	0.3	-	0.6	0.8	28.6
9.0	7.4	46.2	35.3	35.0	24.5	11.5	6.8	5.3	4.9	38.1	28.4	19.0	37.4	6.5	2.6	31.3	16.6	28.4
0.4	0.3	3.0	3.0	1.3	0.8	0.5	0.2	0.2	0.2	4.1	1.7	1.6	2.0	0.3	0.1	5.0	0.8	1.3
-60	-89	4	-64	22	-48	-63	-80	-58	-58	-55	-9	-81	-29	-45	-58	33	-73	-40
22.7	17.2	28.9	17.7	90.5	31.0	21.8	38.3	26.6	46.9	20.8	27.8	19.0	34.8	27.1	12.4	14.1	26.3	34.3
1.0	0.7	1.8	1.5	3.4	1.0	1.0	0.9	1.1	1.7	2.2	1.7	1.6	1.9	1.1	0.5	2.3	1.2	1.5
-29	-48	11	-24	-2	5	-34	-27	-28	-5	-38	13	-53	14	-25	-46	48	-43	-17
6.2	10.3	8.0	5.5	7.7	10.8	7.4	20.9	10.9	7.8	7.6	6.1	7.2	7.4	5.8	5.9	2.8	8.8	11.0
0.26	0.44	0.51	0.46	0.29	0.36	0.33	0.48	0.44	0.28	0.82	0.37	0.62	0.40	0.23	0.21	0.46	0.40	0.50
1	-12	27	-17	11	32	8	-11	13	25	-17	58	-30	43	6	-	40	-7	13
70	20	50	20	2	60	30	130	50	30	160	80	40	30	100	10	30	30	60
540	590	420	460	730	700	510	650	620	620	270	440	320	650	470	660	370	580	550
4.3	1.2	-	1.8	-	-	-	-	0.2	-	-	-	3.2	1.1	4.5	2.4	-	5.1	1.6

UKD: pesticides and threatened species: Great Britain; water withdrawal and public waste water treatment plants: England and Wales.

5) CO_2 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.

I.B: SELECTED ECONOMIC DATA (1)

		CAN	MEX	USA	JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK
GROSS DOMESTIC PRODUCT												
GDP, 2003 (billion USD at 1995 prices and PPPs)		897	836	9487	3202	755	507	79	203	261	147	143
% change (1990-2003)		42.6	44.9	44.2	17.5	109.5	54.1	45.0	30.3	27.3	9.6	31.9
per capita, 2003 (1000 USD/cap.)		28.4	8.1	32.6	25.1	15.8	25.5	19.7	25.2	25.2	14.4	26.6
Exports, 2003 (% of GDP)		37.8	28.4	9.5	11.8	38.1	18.1	29.8	51.8	82.1	66.0	43.5
INDUSTRY	*2*											
Value added in industry (% of GDP)		32	27	23	31	43	26	25	32	27	40	27
Industrial production: % change (1990-2002)		37.3	42.5	42.6	-7.7	152.4	30.3	24.4	46.6	14.1	-11.1	35.8
AGRICULTURE												
Value added in agriculture (% of GDP)	*3*	3	4	2	1	4	4	7	2	1	4	3
Agricultural production: % change (1990-2002)		9.7	34.7	18.5	-9.8	32.7	10.7	35.2	6.5	20.2	..	2.2
Livestock population, 2003 (million head of sheep eq.)		108	281	786	54	27	272	99	17	27	13	25
ENERGY												
Total supply, 2002 (Mtoe)		250	157	2290	517	203	113	18	30	57	42	20
% change (1990-2002)		19.6	26.8	18.8	15.9	119.6	28.8	29.5	20.5	16.8	-11.9	12.3
Energy intensity, 2002 (toe/1000 USD GDP)		0.29	0.19	0.25	0.16	0.28	0.23	0.24	0.15	0.22	0.29	0.14
% change (1990-2002)		-13.8	-10.2	-15.6	-0.3	10.3	-13.8	-8.1	-6.5	-7.0	-17.2	-13.4
Structure of energy supply, 2002 (%)	*4*											
Solid fuels		11.7	4.8	23.7	19.3	22.6	43.4	6.9	11.9	11.9	48.0	21.0
Oil		34.1	59.6	39.3	49.4	50.1	30.8	34.9	43.6	40.7	20.0	42.8
Gas		29.9	24.5	23.5	12.8	10.4	18.3	28.1	21.8	23.8	18.2	23.2
Nuclear		7.8	1.6	9.2	14.9	15.3	-	-	-	21.9	11.4	-
Hydro, etc.		16.5	9.5	4.3	3.5	1.6	7.5	30.1	22.8	1.7	2.4	13.0
ROAD TRANSPORT	*5*											
Road traffic volumes per capita, 2001 (1000 veh.-km/cap.)		10.1	0.7	15.9	6.2	2.3	9.8	10.7	8.3	8.8	4.4	9.0
Road vehicle stock, 2002 (10 000 vehicles)		1891	1953	23457	7226	1395	1280	265	542	539	402	246
% change (1990-2002)		14.2	97.7	24.2	27.9	310.9	30.9	43.6	46.8	26.5	54.9	26.8
per capita (veh./100 inh.)		60	19	81	57	29	65	67	67	52	39	46

.. 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	SLO	ESP	SWE	CHE	TUR	UKD	OECD
128	**1434**	1932	178	125	8	121	1310	19	403	127	364	169	64	770	224	201	431	1347	25873
27.8	**25.5**	22.3	41.1	19.4	34.8	132.4	21.1	71.2	36.3	49.3	49.7	35.0	27.4	39.1	27.0	10.7	45.3	33.6	35.6
24.5	**24.0**	23.4	16.1	12.3	26.8	30.6	22.6	42.9	24.8	27.9	9.5	16.2	11.9	18.4	25.0	27.3	6.1	22.3	22.4
37.0	**25.9**	35.7	20.2	61.8	35.3	82.9	25.4	142.5	61.3	41.2	33.9	30.7	78.0	27.9	43.9	43.7	27.4	25.1	21.9
32	**25**	30	23	31	27	42	29	20	26	38	30	29	32	30	28	27	31	26	29
68.5	**18.0**	12.7	14.6	67.8	..	284.4	12.6	30.1	20.3	40.7	66.6	22.3	8.1	21.5	36.2	19.1	52.6	6.2	24.0
4	**3**	1	7	4	9	3	3	1	3	2	3	4	5	3	2	1	12	1	3
-9.9	**5.4**	-5.9	13.6	-22.6	9.5	4.1	5.3	x	-4.9	-14.3	-14.3	0.7	..	15.0	-10.4	-6.0	12.9	-7.9	..
8	**157**	121	20	13	1	53	67	x	42	7	57	19	5	98	13	12	111	114	2630
36	**266**	346	29	25	3	15	173	4	78	27	89	26	19	132	51	27	75	227	5346
22.1	**17.0**	-2.8	30.9	-10.9	56.7	44.7	13.2	13.2	17.2	23.4	-10.7	48.7	-13.4	44.2	9.4	8.1	42.3	6.8	18.1
0.28	**0.19**	0.18	0.17	0.21	0.45	0.13	0.13	0.21	0.19	0.21	0.25	0.16	0.30	0.17	0.23	0.14	0.18	0.17	0.21
-2.4	**-5.7**	-20.2	-4.0	-23.0	18.6	-35.7	-5.5	-33.7	-13.5	-16.5	-39.0	10.5	-29.6	5.9	-12.5	-1.8	0.4	-18.4	-11.2
19.0	**4.9**	24.7	31.2	14.4	2.8	16.8	8.2	2.5	11.0	3.0	61.2	13.3	22.4	16.5	5.7	0.5	26.3	15.8	20.5
30.4	**33.5**	37.3	57.6	25.9	24.9	57.2	51.9	67.9	38.9	28.6	22.4	62.5	17.3	51.3	29.7	47.1	40.6	34.8	40.5
10.6	**13.8**	21.9	6.3	43.1	-	24.1	34.3	28.1	46.8	22.5	11.3	10.4	31.0	14.3	1.6	9.0	19.6	37.9	21.9
16.8	**41.8**	12.4	-	14.6	-	-	-	-	1.3	-	-	-	25.0	12.5	35.1	25.9	-	10.2	11.1
23.2	**6.1**	3.7	5.0	2.1	72.3	1.9	5.7	1.5	1.9	46.0	5.2	13.9	4.2	5.4	28.1	17.5	13.4	1.3	5.9
9.4	**8.7**	7.2	7.5	2.3	10.4	8.5	8.3	9.0	7.1	7.5	3.6	6.3	2.4	4.5	8.6	7.9	0.8	8.0	8.2
254	**3514**	4728	480	314	18	171	3768	34	778	237	1328	514	148	2288	447	401	624	3135	62375
13.7	**23.5**	26.7	90.3	..	37.1	79.9	26.0	55.8	35.9	21.7	107.5	133.8	50.3	58.4	13.8	23.3	164.3	24.3	32.8
49	**59**	57	44	31	64	44	65	77	48	52	35	49	27	56	50	55	9	52	54

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

4) Breakdown excludes electricity trade.

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

I.C: SELECTED SOCIAL DATA (1)

		CAN	MEX	USA	JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK
POPULATION												
Total population, 2003 (100 000 inh.)		316	1027	2910	1276	479	199	40	81	104	102	54
% change (1990-2003)		14.2	26.4	16.4	3.4	11.8	16.5	19.2	4.5	4.1	-1.5	4.8
Population density, 2003 (inh./km^2)		3.2	52.5	30.2	337.8	482.8	2.6	14.8	96.2	339.8	129.4	125.0
Ageing index, 2003 (over 64/under 15)		70.2	18.8	59.1	135.8	40.8	64.0	54.0	93.7	97.2	90.4	79.1
HEALTH												
Women life expectancy at birth, 2002 (years)		82.2	77.4	79.8	85.2	80.0	82.6	80.9	81.7	81.1	78.7	79.5
Infant mortality, 2002 (deaths /1 000 live births)		5.2	20.1	6.8	3.0	6.2	5.0	6.3	4.1	4.9	4.2	4.4
Expenditure, 2002 (% of GDP)		9.6	6.1	14.6	7.8	5.9	9.1	8.5	7.7	9.1	7.4	8.8
INCOME AND POVERTY												
GDP per capita, 2003 (1000 USD/cap.)		28.4	8.1	32.6	25.1	15.8	25.5	19.7	25.2	25.2	14.4	26.6
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	..	21.7
Minimum to median wages, 2000	*3*	42.5	21.1	36.4	32.7	25.2	57.7	46.3	x	49.2	32.3	x
EMPLOYMENT												
Unemployment rate, 2003 (% of total labour force)		7.6	3.3	6.0	5.3	3.4	5.9	4.7	5.7	8.1	7.8	5.6
Labour force participation rate, 2003 (% 15-64 year-olds)		79.4	55.5	76.0	77.5	66.9	76.1	76.5	78.8	66.9	70.9	80.3
Employment in agriculture, 2003 (%)	*4*	2.8	16.3	1.7	4.6	8.8	4.0	8.2	5.6	2.2	4.5	3.1
EDUCATION												
Education, 2002 (% 25-64 year-olds)	*5*	82.6	12.6	87.3	83.7	70.8	60.9	76.2	77.9	60.8	87.9	80.0
Expenditure, 2001 (% of GDP)	*6*	6.1	5.9	7.3	4.6	8.2	6.0	5.8	5.8	6.4	4.6	7.1
OFFICIAL DEVELOPMENT ASSISTANCE	*7*											
ODA, 2003 (% of GNI)		0.24	..	0.15	0.20	..	0.25	0.23	0.20	0.60	..	0.84
ODA, 2003 (USD/cap.)		64	..	56	70	..	61	41	63	179	..	325

.. 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	SLO	ESP	SWE	CHE	TUR	UKD	OECD
52	**598**	825	110	101	3	40	581	5	162	46	382	104	54	419	90	73	707	605	11545
4.6	**5.4**	4.0	9.4	-2.4	13.5	12.8	2.4	17.5	8.5	7.6	0.2	5.8	1.5	7.8	4.7	9.4	25.9	5.1	10.8
15.4	**108.8**	231.1	83.6	108.8	2.8	56.2	192.8	174.6	390.7	14.1	122.2	113.6	109.7	82.8	19.9	177.9	90.7	247.0	32.9
87.2	**87.1**	126.6	111.9	94.5	51.5	53.0	126.2	74.6	74.2	74.1	73.4	102.0	62.2	116.3	95.8	98.9	19.0	82.3	68.5
81.5	**82.9**	81.3	80.7	76.7	82.3	80.3	82.9	81.5	80.7	81.5	78.7	80.5	77.8	83.1	82.1	83.0	71.0	80.4	..
3.0	**4.1**	4.3	5.9	7.2	2.2	5.1	4.7	5.1	5.0	3.9	7.5	5.0	7.6	3.4	2.8	4.5	38.3	5.3	..
7.3	**9.7**	10.9	9.5	7.8	9.9	7.3	8.5	6.2	9.1	9.1	6.1	9.3	5.7	7.6	9.2	11.2	6.6	7.7	..
24.5	**24.0**	23.4	16.1	12.3	26.8	30.6	22.6	42.9	24.8	27.9	9.5	16.2	11.9	18.4	25.0	27.3	6.1	22.3	22.4
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	37.2	x	55.8	x	48.9	47.1	x	35.5	38.2	..	31.8	x	x	..	41.7	..
9.1	**9.7**	8.7	9.5	5.9	3.3	4.7	8.8	3.8	3.5	4.5	19.6	6.4	17.4	11.3	4.9	4.0	10.5	5.0	7.1
74.4	**70.2**	75.9	64.8	60.1	86.1	69.9	61.7	67.0	67.2	80.2	62.9	76.0	69.8	69.0	76.5	87.6	51.8	76.2	71.1
5.1	**3.6**	2.5	16.5	5.5	7.3	6.4	4.9	1.3	3.0	3.7	18.4	12.7	5.8	5.7	2.1	4.1	33.9	1.2	6.2
74.8	**64.8**	83.0	50.5	71.4	59.0	60.3	44.4	56.6	66.5	86.3	47.0	20.4	85.9	41.3	81.6	82.4	25.2	64.3	64.9
5.8	**6.0**	5.3	4.1	5.2	6.7	4.5	5.3	3.6	4.9	6.4	5.2	5.9	4.1	4.9	6.5	5.7	3.5	5.5	5.6
0.35	**0.41**	0.28	0.21	..	..	0.39	0.17	0.81	0.80	0.92	..	0.22	..	0.23	0.79	0.39	..	0.34	0.25
107	**121**	82	33	..	..	127	42	429	245	447	..	31	..	47	268	177	..	104	79

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.

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
1956	Washington	Protocol	Y D	R	R	R
1949	Geneva	Conv. - Road traffic	Y R		R	R
1957	Brussels	Conv. - Limitation of the liability of owners of sea-going ships	Y S			D
1979	Brussels	Protocol	Y			
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	Y			
1963	Moscow	Treaty - Banning nuclear weapon tests in the atmosphere, in outer space and under water	Y 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
1973	London	Protocol (pollution by substances other than oil)	Y	R	R	
1969	Brussels	Conv. - Civil liability for oil pollution damage (CLC)	Y D	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 (replaces the 1971 Convention)	Y R	R		R
2000	London	Amendment to protocol (limits of compensation)	Y R	R		R
2003	London	Protocol (supplementary fund)				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
1971	Ramsar	Conv. - Wetlands of international importance especially as waterfowl habitat	Y R	R	R	R
1982	Paris	Protocol	Y 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
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
1978	Geneva	Amendments	Y R	R	R	R
1991	Geneva	Amendments	Y		R	R

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	SVK	ESP	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	**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	
	D			D		D	D	**D**	D			R		S		D	D	R	R		R	D	R		D	
	R			R			S		S						R			R	R		R		R		D	
	R	S		R		R	R	**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	
S				S					S				S			R			R							
					R						R							R		R	S				S	
				S	R	R	R	**S**	R	R	R			R		R	R	R	S	R	S	R	S	S	S	
					S						S			S				S								
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	
S	R	R		R		R	R	**R**	R	S		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	
D	D	D		D		D	D	**D**	D	D		D	D	D	R	D	D	D	R		D	D	D		D	
R	R			R		R	R	**R**	R	R		R	D	R	R	R	R	R	R		R	R	R		D	
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	
D	D	D		D		D	D	**D**	D	D		D	D	D		D	D	D	R		D	D	D		D	
	R			R		R	R	**R**	R	R		R	D	R		R	R	R	R		R	R			D	
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			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		R	
	R	R		S		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	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	

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

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

		CAN	MEX	USA	JPN
1972 Geneva	Conv. - Safe container (CSC)	Y R	R	R	R
1972 London, Moscow, Washington	Conv. - International liability for damage caused by space objects	Y R	R	R	R
1972 Paris	Conv. - Protection of the world cultural and natural heritage	Y R	R	R	R
1973 Washington	Conv. - International trade in endangered species of wild fauna and flora (CITES)	Y 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	Y 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
1978 London	Annex III	Y R		R	R
1978 London	Annex IV	Y			R
1978 London	Annex V	Y	R	R	R
1997 London	Annex VI	Y		S	
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			
2001 Canberra	Agreem. - Conservation of albatrosses and petrels (ACAP)	Y			
1982 Montego Bay	Conv. - Law of the sea	Y R	R		R
1994 New York	Agreem. - relating to the implementation of part XI of the convention	Y R	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	Y R		R	S
1983 Geneva	Agreem. - Tropical timber	Y 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
1987 Montreal	Protocol (substances that deplete the ozone layer)	Y R	R	R	R
1990 London	Amendment to protocol	Y R	R	R	R
1992 Copenhagen	Amendment to protocol	Y R	R	R	R
1997 Montreal	Amendment to protocol	Y R		R	R
1999 Beijing	Amendment to protocol	Y R		R	R
1986 Vienna	Conv. - Early notification of a nuclear accident	Y R	R	R	R
1986 Vienna	Conv. - Assistance in the case of a nuclear accident or radiological emergency	Y R	R	R	R
1989 Basel	Conv. - Control of transboundary movements of hazardous wastes and their disposal	Y R	R	S	R
1995 Geneva	Amendment				
1999 Basel	Prot. - Liability and compensation for damage				

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	SVK	ESP	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	S	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	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		D	D	**R**	D	R			R			R	R	R			R	D	R	R	R	
	R					R	R	**S**	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	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
				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		S				S					S		R					
				S		R	R	**R**	R	S	R		R		R	R					R	R	R	R		R	S
	R	R						**S**													R				S	
R	R	R	R	R	R	S	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	S	R	**R**	R	R	R	R	R	R	R	R	R	R	R	R	R	R	S		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	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	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	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	S	**S**			S				S							S	S		S	

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

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

			CAN	MEX	USA	JPN
1989 London	Conv. - Salvage	Y	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
2000 London	Protocol - Pollution incidents by hazardous and noxious substances (OPRC-HNS)					
1992 Rio de Janeiro	Conv. - Biological diversity	Y	R	R	S	R
2000 Montreal	Prot. - Biosafety (Cartagena)	Y	S	R		R
1992 New York	Conv. - Framework convention on climate change	Y	R	R	R	R
1997 Kyoto	Protocol	Y	R	R	S	R
1993 Paris	Conv. - Prohibition of the development, production, stockpiling and use of chemical weapons and their destruction	Y	R	R	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	Y	R	R	R	R
1994 Vienna	Conv. - Nuclear safety	Y	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
1996 London	Conv. - Liability and compensation for damage in connection with the carriage of hazardous and noxious substances by sea (HNS)		S			
2000 London	Protocol - Pollution incidents by hazardous and noxious substances (OPRC-HNS)					
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		R	R
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)	Y	R		S	R
2001 London	Conv. - Civil liability for bunker oil pollution damage					
2001 London	Conv. - Control of harmful anti-fouling systems on ships				S	R
2001 Stockholm	Conv. - Persistent organic pollutants	Y	R	R	S	R

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	SVK	ESP	SWE	CHE	TUR	UKD	EU
	R	R		R		R	S	**R**	R	R		R	R	R		R	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	
						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
S		S	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	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	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
						S	S		S							S	S					S			S	
						S	S	**S**	S	R						R		R				R				
	S				S									S												
R	R		R	R	R	R	R	**R**	R	R	R		R	S	R	R	R	R		R	R	R	R		R	
							R		S		R				S	R	R		S			R				
R	R	R	R	R	R	R	R	**R**	R	R	R			R	R	R	R		S		R	R	R	R	S	R	R
														S							R	S				
	S					R	S										R	R			R	R				
S	R	R	R	S	R	R	R	**R**	R	S	S	R	S	S	R	R	R	S	R	R	R	R	R	S	S	S

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				
1949 Washington	Conv. - Establishment of an inter-American tropical tuna commission	Y	D	R	R	R
1950 Brussels	Agreem. - Prior consultation concerning setting up near the border of permanent storage of explosive substances	Y				
1950 Paris	Conv. - Protection of birds	Y				
1950 Brussels	Protocole to establish a tripartite standing committee on polluted waters	Y				
1956 Rome	Agreem. - Plant protection for the Asia and Pacific region	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				R
1959 Washington	Treaty - Antarctic	Y	R		R	R
1991 Madrid	Protocol to the Antarctic treaty (environmental protection)	Y	R		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				
1961 Paris	Prot. - Constitution of an int'l commission for the protection of the Mosel against pollution	Y				
1990 Brussels	Complementary protocol (int'l commi. for the protection of Mosel and Sarre)	Y				
1992 Maria Laach	2d compl.prot. (to int'l commi. protec. of Mosel and Sarre, and to first compl. prot.)	Y				
1963 Bern	Agreem. - International commission for the protection of the Rhine against pollution	Y				
1976 Bonn	Supplementary agreement	Y				
1976 Bonn	Conv. - Protection of the Rhine against chemical pollution	Y				
1976 Bonn	Conv. - Protection of the Rhine from pollution by chlorides (modified by exchanges of letters)	Y				
1991 Brussels	Protocol	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	R
1967 London	Conv. - Conduct of fishing operations in the North Atlantic	Y	S		S	
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
1970 Brussels	Conv. - Benelux convention on the hunting and protection of birds	Y				
1972 London	Conv. - Conservation of Antarctic seals	Y	R		R	R
1974 Stockholm	Conv. - Nordic environmental protection	Y				

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	SVK	ESP	SWE	CHE	TUR	UKD	EU
				R				**S**						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		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	
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				R				**R**							R											
			S	R				**S**		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	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	S	S	R	**R**	R	R	S			R		R	R	R		S	R	R	S		R	
			S	R		R	R	**R**	R	R				R	S	R	R		R		R	R	S	R	R	
			S	R		R	R	**R**	R					R	S	R	R				R	R	S		R	
			S	R		R	R	**R**	R	R				R	S	R	R		R		R	R	S	R	R	
			S	R		R	R	**R**	R					R	S	R	R				R	R	S		R	
			S	R		R	R	**R**	R	R				R	S	R	R		R		R	R	S	R	R	
			S	R		R	R	**R**	R					R	S	R	R				R	R	S		R	
				S	R	R	R	**S**	R	R	R			R		R	R	R	S	R	S	R	S	S	S	
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	R	R		R				**R**						R			R	R							R	
				R		R		**R**	R				R	R	S	R		R	R		R	R			R	
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				R		R		**R**	R			R	S	R		R	R	S	R		R	R			R	
				R		R		**R**	R					R	R	R					R		R		R	
						R			S						R	R					R		S		R	
			R	R	R	R	R	**R**	R	R		R	R	R	R	R	D		R		R	D	R	R	R	
			R	R	R	R	R	**R**	R	R		R	R	R	R	R	D		R		R	D	R	R	R	
			R	R		R		**D**	R	R		R		R	R				D		R	D	D		D	
R				R				**R**	R					R				R	R		R					
				R											R	R										
	R	S		R				**R**	R					R			R	R							R	
						R	R										R					R				

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

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

		CAN	MEX	USA	JPN
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)				
1976 Barcelona	Protocol (pollution by oil and other harmful substances in cases of emergency)	Y			
2002 Valletta	Protocol (preventing pollution from ships and, in cases of emergency, combating pollution)				
1980 Athens	Protocol (pollution from land-based sources)	Y			
1996 Syracuse	Protocol (pollution from land-based sources and activities)				
1982 Geneva	Protocol (specially protected areas)	Y			
1996 Monaco	Protocol (specially protected areas and biological diversity)	Y			
1996 Izmir	Protocol (pollution by transboundary movements of hazardous wastes and their disposal)				
1995 Barcelona	Amendment to convention				
1976 Monaco	Agreem. - Protection of the waters of the mediterranean coastline (RAMOGE)	Y			
1976 Apia	Conv. - Conservation of nature in the South Pacific	Y			
1978 Ottawa	Conv. - Future multilateral co-operation in the Northwest Atlantic fisheries (NAFO)	Y	R	R	R
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)	Y	R	R	
1998 Aarhus	Protocol (persistent organic pollutants)	Y	R	S	
1999 Gothenburg	Protocol (abate acidification, eutrophication and ground-level ozone)		S	R	
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 London	Conv. - Future multilateral co-operation in North-East Atlantic fisheries	Y			
1982 Brussels	Conv. - Benelux convention on nature conservation and landscape protection	Y			
1982 Paris	Memorandum of understanding on port state control	Y	R		
1982 Reykjavik	Conv. - Conservation of salmon in the North Atlantic Ocean	Y	R	R	
1983 Bonn	Agreem. - Co-operation in dealing with poll. of the North Sea by oil and other harmful subst.	Y			
1989 Bonn	Amendment	Y			
1983 Cartagena	Conv. - Protection and development of the marine environment of the wider Caribbean region	Y	R	R	
1983 Cartagena	Protocol (oil spills)	Y	R	R	
1990 Kingston	Protocol (specially protected areas and wildlife)	Y	S	R	
1999 Oranjestat	Protocol (pollution from land based sources)			S	
1985 Nairobi	Conv. - Protection, management and development of the marine and coastal environment of the Eastern African region	Y			
1985 Nairobi	Protocol (protected areas and wild fauna and flora in the Eastern African region)	Y			
1985 Nairobi	Protocol (co-operation in combating marine pollution in cases of emergency in the Eastern African region)	Y			
1985 Rarotonga	Conv. - South Pacific nuclear free zone treaty	Y			
1986 Noumea	Conv. - Protection of the natural resources and environment of the South Pacific region	Y		R	
1986 Noumea	Protocol (prevention of pollution by dumping)	Y		R	
1986 Noumea	Protocol (co-operation in combating pollution emergencies)	Y		R	
1993 Apia	Agreem. - South Pacific Regional Environment Programme (SPREP)	Y		S	
1987 Port Moresby	Treaty - South Pacific fisheries	Y		R	

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	SVK	ESP	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	S					S							S			R		S
								R	R					R							R			R		R
								R	R					R							R			R		R
								R	R					R							R			R		R
								R	S					R							R			R		R
									S					S							S			S		
								R	R					R							R			R		R
								R						R												
	R	R						**R**																		
R						R		**R**				R					R	R	D		D					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	S	R			R	R	R	R		S	R	R	R	R	R		R	S
			R	R	R	R	R	**R**	R	R	R		R	R	R	R	R	S		R	R	R	R	R		R	R
			R	S	R	R	R	**R**	R	S	S	S	S	S	R	R	R	S	S	R	S	R	R		S	R
			R	S	R	R	R	**R**	R	S	R	R	S	S	R	R	R	S	S	R	S	R	R		S	R
			S	S	R	R	R	**S**	R	S	S		S	S	R	R	R	S	R	S	R	R	S		S	R
			R	R	R	R	R	**R**	R		R	S	R	R	R	R	R	R	R	R	R	R	R	R			
			S	S				**R**	R			S		S	R	R			S	R		R	R			
								S	R			S			R	R			S	R		R	S			
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						R	R					R					R					D				R
				R		R		**R**	R							R	R					R			R	R
				R		R		**R**	R							R	R					R			R	R
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II.B: SELECTED MULTILATERAL AGREEMENTS (REGIONAL) (cont.)

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

		CAN	MEX	USA	JPN
1989 Wellington	Conv. - Prohibition of fishing with long driftnets in the South Pacific	Y		R	
1990 Noumea	Protocol	Y		R	
1990 Noumea	Protocol	Y	S		
1990 Lisbon	Agreem. - Co-op. for the protection of the coasts and waters of the North-East Atlantic				
1990	Conv. - establishing a marine scientific organization for the North Pacific Region (PICES)	Y	R	R	R
1991 Espoo	Conv. - Environmental impact assessment in a transboundary context	Y	R	S	
2001 Sofia	Amendment				
2003 Kiev	Prot.- strategic environmental assessment				
1991 Salzburg	Conv. - Protection of Alps	Y			
1994 Chambery	Prot. - Nature protection and landscape conservation	Y			
1994 Chambery	Prot. - Town and Country Planning and Sustainable Development	Y			
1994 Chambery	Prot. - Mountain agriculture	Y			
1996 Brdo	Prot. - Mountain forests	Y			
1996 Brdo	Prot. - Tourism	Y			
1998 Bled	Prot. - Energy	Y			
1998 Bled	Prot. - Land conservation	Y			
2000 Lucerne	Prot. - Transport	Y			
2000 Lucerne	Prot. - Dispute settlement	Y			
1992 Helsinki	Conv. - Transboundary effects of industrial accidents	Y	S	S	
2003 Kiev	Prot. - Civil liability and compensation for damage caused by the transboundary effects of industrial accidents on transboundary waters				
1992 Helsinki	Conv. - Protection and use of transboundary water courses and international lakes	Y			
1999 London	Prot. - Water and health				
2003 Kiev	Prot. - Civil liability and compensation for damage caused by the transboundary effects of industrial accidents on transboundary waters				
1992 La Valette	European Conv. - Protection of the archaeological heritage (revised)	Y			
1992 Honiara	Treaty - Cooperation in fisheries surveillance and law enforcement in the South Pacific region	Y			
1993 Lugano	Conv. - Civil liability for damage resulting from activities dangerous to the environment				
1993	North American agreement on environmental co-operation	Y	R	R	R
1993 Canberra	Conv. - Conservation of Southern Pacific bluefin tuna	Y			R
1993 Rome	Agreem. - Establishment of the Indian Ocean Tuna Commission	Y			R
1994 Lisbon	Treaty - Energy Charter	Y			R
1994 Lisbon	Protocol (energy efficiency and related environmental aspects)	Y			R
1994 Charleville-Mézières	Agreem.-Protection of the Meuse	Y			
1994 Charleville-Mézières	Agreem.-Protection of the Scheldt	Y			
1996	Agreem. - Transfrontier co-operation with Saarlorlux-Rhineland-Palatinate regions				
1996 Karlsruhe	Agreem. - Transfrontier co-operation	Y			
1996 Strasbourg	Conv. - Disposal of waste and waste water generated from navigation on the Rhine				
1998 Aarhus	Conv. - Access to env. information and public participation in env. decision-making	Y			
2003 Kiev	Prot. - Pollutant Release and Transfer Registers (PRTR)				
1998 Strasbourg	Conv. - Protection of the environment through criminal law				
1999 Bern	Conv. - Protection of the Rhine	Y			
2000 Florence	Conv. - European lanscape convention	Y			
2000 Geneva	Agreem. - International carriage of dangerous goods by inland waterways (AND)				

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	SVK	ESP	SWE	CHE	TUR	UKD	EU
	R	R						**S**																		
								R											R		S					R
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			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								
	S			S	S	S	S	**S**	S	S	S		S	S	S	S	S	S	S	S	S	S			S	S
			R					**R**	R					R									R			R
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			R	S	R	R	R	**R**	R	R	R			R	R	S	R	R	S	R	R	R	R		R	R
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			R	R	R	R	R	**R**	R	R	R			R	R	R	R	R	R	R	R	R	R		S	R
				R	R	S	S	**S**	S	S	R	S		S	R	S	R	S	S	R	S	S	S		S	
			S	S		S	S			S	S				S		S	S	S			S			S	
				S	R	S	R	**R**	R	S	R		R	S	S	S	R	R	R	R	S	R	R	R	R	
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							S			S		S		S	S	S			S							
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				S				**S**	S						S	S							S			
			S	R	R	R	R	**R**	S	S	R	S	S	R	S	S	R	R	R		S	S	S		S	S
			S	S	S	S	S	**S**	S	S	S		S	S	S	S	S	S	S		S	S	S		S	S
			S	S		S	S	**S**	S	S		S		S	S							S				
								R	R						R	R							R			R
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					S			**S**	S		R			S	S	R				S						

Reference III
ABBREVIATIONS

ADEME	Environment and Energy Management Agency
AFSSE	French Health and Environmental Safety Agency
ANDRA	National Radioactive Waste Management Agency
ASN	Nuclear Safety Authority
BRGM	French geological survey (formerly Bureau of Geological and Mining Research)
CADA	Commission on Access to Government Documents
CAP	Common Agricultural Policy of the European Union
CITEPA	Interprofessional Technical Centre for Air Pollution Studies
CNDP	National Commission for Public Debate
CNRS	National Centre for Scientific Research
CFC	Chlorofluorocarbon
CSP	Higher Council on Fisheries
DAC	Development Assistance Committee of the OECD
DDAF	Département Directorate for Agriculture and Forestry
DDASS	Département Directorate for Health and Social Affairs
DDE	Département Directorate for Infrastructure
DGSNR	Directorate-General for Nuclear Safety and Radioprotection
DIREN	Regional Environment Directorate
DRIRE	Regional Industry, Research and Environment Directorate
EDF	Électricité de France
EEZ	Exclusive economic zone
EIA	Environmental impact assessment
EMAS	EU Eco-Management and Audit Scheme
FAO	UN Food and Agriculture Organization
FFEM	French Global Environment Facility
FOREC	Fund to finance reform of social charges
GDF	Gaz de France
GDP	Gross domestic product
GEF	Global Environment Facility
GHG	Greenhouse gas
HCB	Hexachlorobenzene
HCFC	Hydrochlorofluorocarbon

IFEN	French Environment Institute
IFRECOR	French Coral Reefs Initiative
IFREMER	French Research Institute for Exploitation of the Sea
IPPC	Integrated pollution prevention and control
IRSN	Institute for Radioprotection and Nuclear Safety
IUCN	International Union for Conservation of Nature and Natural Resources
LAURE	Law on Air and Energy Efficiency
LPG	Liquefied petroleum gas
LRTAP	Long-range Transboundary Air Pollution
MAAPR	Ministry of Agriculture, Food, Fisheries and Rural Affairs
MARPOL	International Convention for the Prevention of Pollution from Ships
MEDD	Ministry of Ecology and Sustainable Development
MIES	Interministerial Task Force on the Greenhouse Effect
MINEFI	Ministry of the Economy, Finance and Industry
Mtoe	Million tonnes of oil equivalent
NGO	Non-governmental organisation
NMVOC	Non-methane volatile organic compound
ODA	Official development assistance
ODP	Ozone depletion potential
ONF	National Forestry Office
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PDU	Urban mobility plan
PLU	Local zoning plan
PMPOA	Programme to Control Pollution of Agricultural Origin
PNLCC	National Programme to Combat Climate Change
PNSE	National Health and Environment Plan
POP	Persistent organic pollutant
SAGE	Water development and management plan
SCA	Special conservation area
SDAGE	Water development and management master plan
SEQ-eau	Water quality evaluation system
SISE-eau	Water Health and Environment Information System
SMVM	Maritime enhancement plan
TAC	Total allowable catch
TGAP	General tax on polluting activities
TGV	High-speed train

TIPP	Domestic tax on oil products
TPES	Total primary energy supply
TSP	Total suspended particulates
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
VOC	Volatile organic compound
WTO	World Trade Organization
ZNIEFF	Natural areas of interest for their ecology, fauna and flora

Reference IV

PHYSICAL CONTEXT

France is the *largest country in the European Union*: its territory within Europe, referred to as "metropolitan France", covers 550 000 km^2. It has overseas "départements" (DOM) and other overseas territories in the Atlantic, Pacific and Indian Oceans as well as in the Antarctic. The DOM (Guadeloupe, French Guiana, Martinique and Réunion) cover 90 000 km^2, with French Guiana accounting for much of the total.

Metropolitan France has *long coasts* on the North Sea and the Channel (La Manche), the Atlantic Ocean and the Mediterranean Sea, with a total length of 5 500 km. France shares land borders with Andorra, Belgium, Germany, Italy, Luxembourg, Monaco, Switzerland and Spain. Its *maritime domain* covers 11 million km^2, most of it associated with overseas territories. Most French ocean fishing takes place in the waters of Metropolitan France and other EU countries.

Metropolitan France

France, which has abundant *renewable freshwater resources*, is criss-crossed by 277 000 km of watercourses, including four major *rivers*: the Loire (1 020 km), Rhône (522 of its 812 km are in France), Seine (776 km), Garonne (650 km); in addition the Rhine forms part of the border with Germany. The country shares Lake Geneva (582 km^2) with Switzerland, and the many *lakes* within its own territory include Lake Annecy (27 km^2) and the *reservoirs* of the Marne and the Seine. France's water resources are unevenly distributed both geographically and seasonally, which can result in high water or floods, as well as droughts.

France has a *temperate climate*. As a result of the prevailing winds and topography, it is the only country in Europe with four distinct biogeographic areas: Atlantic in much of the country, continental in the centre and east, Mediterranean in the south and Alpine in the Alps and Pyrénées. This diversity of climate is accompanied by a wealth of *natural resources*, giving France great responsibility for the preservation of *ecological* and *biological diversity*. Currently 13.3% of the country is protected. France has some 1.5 million hectares of *wetlands* (excluding lakes, rivers and coastal mudflats). The Camargue, its largest wetland, covers 145 000 hectares, about two-thirds of which are

designated as nature reserve. There are several *mountain* ranges, the highest being the Alps (Mont Blanc, 4 808 metres), the Pyrénées and the Jura; lower ranges include the Vosges and the Massif Central. *Forest* and woodlands cover 16 million hectares, or 32% of the surface area of Metropolitan France, mostly in the centre, east and south. The forests of the Mediterranean uplands and the Landes area in the south-west are the most vulnerable to forest fires. Some 56% of the country is *farmland*.

France's *subsoil resources* include a wealth of building materials, such as limestone, aggregates and gypsum. It also has an abundance of industrial minerals, including kaolin, potassium compounds and silica. However, it has *few energy resources* (notably uranium) and imports almost all its crude oil and natural gas.

DOMs and other overseas territories

France's DOMs (Guadeloupe, French Guiana, Martinique, Réunion) and other overseas territories (Mayotte, New Caledonia, French Polynesia, Saint Pierre and Miquelon, Wallis and Futuna) are endowed with very substantial *natural resources* (marine, mineral and botanic resources and renewable energy sources). Some of these areas are exposed to *natural phenomena* that can cause considerable damage, such as hurricanes, earthquakes and volcanic eruptions.

Reference V
SELECTED ENVIRONMENTAL EVENTS (1996-2004)

1996

- Establishment of the Water Research Centre.
- Issuance of an order on billing for water supply and waste water collection and treatment (to take effect in 1998).
- Publication of a report on water price trends from 1991 to 1996, showing the average rise in water bills to be 56%, or 9% per year, with a regional variation of 1 to 5.7.
- Conclusion of two agreements between the government, EDF-GDF, the trade body representing water companies and the Association of French Mayors, aiming to promote the right to a basic minimum supply of water and electricity for the poor.
- Classification of the Canal du Midi as UNESCO World Heritage site.

1997

- Submission of the Second National Communication under the United Nations Framework Convention on Climate Change (UNFCCC).
- Publication of a report by the Court of Accounts (auditors) criticising municipal water management.
- Launching of the National Water Data Network's Web site.
- Classification of the Canal du Midi, the Pyrénées-Mont-Perdu site and the Cirque de Gavarnie and neighbouring cirques and valleys as cultural and natural UNESCO World Heritage sites.
- Designation of the Verdon regional nature park in the Provence-Alpes-Côte d'Azur region.
- Submission of France's first 535 proposals for Natura 2000 sites under the EU habitats directive (92/43/EEC).
- Continued reintroduction of brown bears into the Haute-Garonne département (two in 1996 and one in 1997) as part of a Franco-Spanish programme with EU support.

1998

- Signature of the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters.
- Holding of the first international conference on water and sustainable development, on a French initiative, with representatives from 84 countries attending the event in Paris.
- Issuance of a decree establishing the Environmental Accounts and Economy Commission.
- Publication of Nicole Bricq's parliamentary report on environmental taxation.
- Designation of three regional nature parks: Avesnois (Nord-Pas-de-Calais), Perche (Basse-Normandie) and Périgord-Limousin (Aquitaine).
- Designation of the Somme Bay (Picardie) as a Ramsar site.
- Publication of a national guide on methodology for drawing up objectives documents for Natura 2000 sites.

1999

- Increase in financial resources for natural heritage and establishment of the Natural Environments Management Fund.
- Conclusion by France, Italy and Monaco of an agreement creating a marine sanctuary for cetaceans in the Mediterranean.
- Establishment of the French Coral Reefs Initiative (IFRECOR).
- Preparation by the Interministerial Task Force on the Greenhouse Effect (MIES) of a handbook for decision makers to get local authorities involved in measures to cut emissions of greenhouse gases (GHGs).
- Classification of the village and vineyards of Saint-Emilion, in the Aquitaine region, as a UNESCO World Heritage cultural site.
- Passage of the Framework Law on Regional Land Use and Development, also known as the Voynet Law, which introduces the idea of population and employment districts.
- Passage of the Framework Law on Agriculture, recognising agriculture's environmental and social functions, including landscape maintenance, as agricultural policy objectives along with its economic functions.

- Publication of Yves Tavernier's report on polluting activities and water policy.
- Establishment, by decree, of territorial farming contracts as a tool for use particularly on agricultural sites in the Natura 2000 network.
- Ruling against France by the European Court of Justice for failure to classify enough of the Poitevin fenlands as special protection areas and for not strengthening the rules regarding protection of such areas.
- Delivery to the Prime Minister of a report by François Patriat, member of the National Assembly for the Côte d'Or département, entitled "Proposals for Responsible and Calm Hunting".
- Shipwreck of the Erika, carrying 37 000 tonnes of heavy fuel oil, off the Brittany coast.
- Destruction of a record number of trees by the storms designated "Lothar" and "Martin".
- Storms and flooding in southern France (the Aude, Hérault, Pyrénées-Orientales and Tarn départements), resulting in 35 deaths and serious material damage.

2000

- Agreement between Germany, France and Switzerland on cross-border co-operation in the Upper Rhine region.
- Signature of the Council of Europe's European Landscape Convention.
- Launching of the National Programme to Combat Climate Change (PNLCC).
- Holding of a MIES conference in Chamonix on climate change and its effect on the mountain environment.
- Holding of a MIES conference in Arles on climate change and coastal areas.
- Classification of the Loire valley between Sully-sur-Loire and Chalonnes-sur-Loire as a UNESCO World Heritage cultural site.
- Issuance of an ordinance on the legislative part of the Environment Code.
- Passage of the Law on Solidarity and Urban Renewal providing for protection of landscapes in the framework of local zoning plans and for public consultation on regional nature park charters.
- Establishment of the Antilles and French Guiana Centre on Regional Activities (CARAG) at the Guadeloupe Regional Environment Directorate.
- Introduction of a planned reform of Water Agency charges.

- Issuance of a prime ministerial order concerning the plan to designate a marine national park in the Iroise Sea off the Finistère département.
- Adoption of the first action plan on coral reef preservation.
- Online publication by the French Research Institute for Exploitation of the Sea (IFREMER) of sea and coastal water quality monitoring data.
- Passage of the Hunting Law, amending the Environment Code and confirming the National Hunting Office's missions relating to wildlife.
- Introduction of the first action plan for the preservation of herding and wolves in the Alps.
- Establishment of a task force on designating the Hauts de la Réunion area as a national park.
- Establishment of the National Landscape Council.
- Shipwreck of the Ievoli Sun, carrying 600 tonnes of chemicals, off Alderney in the Channel Islands.

2001

- Passage of the Law Making Climate Change Control and Prevention of Risks Related to Global Warming a National Priority, which also set up the National Research Centre on the Effects of Global Warming for Metropolitan France and the overseas territories.
- Submission of France's Third National Communication under the UNFCCC.
- Holding of the first PNLCC national evaluation conference.
- Issuance of a decree on action to be taken to protect water from pollution by nitrates of agricultural origin.
- Publication of a European Commission report on implementation of the Urban Waste Water Directive, which notes that France has not answered Commission requests for information, in particular about the situation of cities of more than 150 000 population-equivalent.
- Ruling by the European Court of Justice condemning France for failure to fulfil its obligations under the drinking water abstraction directive.

- Ruling by the Rennes (Brittany) administrative court, on a petition from the water company Lyonnaise des Eaux, condemning the government for shortcomings with regard to highly polluting agricultural practices.
- Delivery of a report by Yves Tavernier entitled "From Opacity to Transparency: The Price of Water".
- Introduction of the water policy reform bill.
- Publication of a report by a commission investigating the causes of repeated or particularly severe floods and the consequences of storms, in an effort to determine responsibility, evaluate costs and assess prevention, early warning and compensation systems.
- Delivery of a report by Senator Louis Le Pensec, "Towards New Shores: Refounding the Coastal Conservatory".
- Publication of the first review of implementation of the national action plan on coral reef preservation.
- Issuance of an ordinance on transposition of the habitats and birds directives (in relationship to Natura 2000) and implementing decrees.
- Delivery to the prime minister of a report by Geneviève Perrin-Gaillard, member of the National Assembly for the Deux-Sèvres département, and Philippe Duron, entitled "From Zoning to Contract: A Strategy for the Future".
- Signature of the Bonn Convention Agreement on Conservation of Albatross and Petrels.
- Meeting in Paris of the CITES Standing Committee, in its 45th session.
- Passage of the Framework Law on Forests, making official the objective of sustainable forest management.
- Creation of the French Guiana and Monts d'Ardèche regional nature parks.
- Flooding in the Somme département.

2002

- Ratification of the Aarhus Convention.
- Ratification of the Convention on the Protection of the Rhine, signed in Bern in 1999.
- Updating of the legislative part of the Environment Code.

- Passage of the Law on Local Democracy, amending the Environment Code as regards nature reserves, the Coastal Conservatory and the establishment of regional scientific councils on natural heritage.
- Revision of the 1993 decree creating a Polar Environment Committee.
- Ratification of the Cartagena Convention Protocol on Specially Protected Areas and Wildlife.
- Holding of the second national evaluation conference on the PNLCC.
- Holding of a government seminar on sustainable development in which a "Plan Bretagne" for sustainable development in farming and restoration of water quality is proposed.
- Ruling by the European Court of Justice condemning France for failure to comply with the 1991 directive on the protection of water from nitrate pollution.
- Issuance of a decree on financial support for control of pollution related to manure.
- Issuance of a circular launching a call for projects on flood prevention plans in some 15 river basins for 2003-06.
- Publication of a reference system on French river basins.
- Issuance of a decree approving public service plans, including one concerning natural and rural areas under the Framework Law on Regional Land Use and Sustainable Development.
- Establishment, by decree, of a national research centre on wildlife and habitats.
- Conclusion of an objectives contract between the government and the National Forestry Office, setting quantified objectives for integral and managed biological reserves in forests.
- Establishment, on French initiative, of an ad hoc group on forests at the sixth Conference of the Parties to the Convention on Biological Diversity in The Hague.
- Flooding in the Gard département of southern France.

2003

- Adoption of the national sustainable development strategy.
- Adoption by the Cabinet of a bill to make the Environmental Charter part of the Constitution.

- Ratification of the Convention on Persistent Organic Pollutants.
- Ratification of the Bonn Convention Agreement on the Conservation of African-Eurasian Migratory Waterbirds.
- Ratification of the Alpine Convention protocols on mountain farming and dispute settlement.
- Introduction of a bill to authorise ratification of the European Landscape Convention.
- Signature of the Fontevrault Charter on the quality of the Loire Valley winegrowing landscapes inscribed on the UNESCO World Heritage list.
- Passage of the Law on Environmental Protection in the Antarctic.
- Passage of the Law on Prevention of Technological and Natural Risks and Repair of Damage, strengthening the 1995 Law on Enhanced Environmental Protection.
- Complete revision of the MIES handbook for decision makers.
- Passage of the Law Creating an Ecological Protection Zone off the Coast of the Republic.
- Submission by France and five other countries of a proposal to the International Maritime Organization for the designation of a particularly vulnerable sea area in the Channel, North Sea and Atlantic Ocean.
- Issuance of a circular establishing a central hydrometeorological and flood forecasting support service and reorganising flood warning services.
- Launch by the French geological survey, BRGM, of its online national groundwater database, ADES, providing piezometric and quality data.
- Submission of proposals for 1 209 sites under the "Habitats" directive and 148 under the "Birds" directive.
- Designation of the Narbonnaise regional nature park in the Languedoc-Roussillon region.
- Designation of four Ramsar sites to mark World Wetlands Day.
- Announcement of the "Grand Site de France" (major site) certification programme.
- Passage of the Hunting Law.
- Issuance of a decree amending the Rural Code, creating sustainable farming contracts to replace the territorial farming contracts in operation since in 1999 and

incorporating in them the implementation of Natura 2000 in agricultural environments.

- Replacement of support for extensive livestock rearing by an agri-environmental grasslands premium.
- Introduction of a proposed forestry code for French Guiana.
- Occurrence of exceptionally severe drought and heatwave.
- Publication of a report regarding the September 2002 floods.

2004

- Adoption by the National Assembly and Senate of the constitutional bill on the Environmental Charter.
- Adoption of the 2004 Climate Plan.
- Approval by the Cabinet of a greenhouse gas emission trading system.
- Adoption of the 2004-08 National Health and Environment Plan.
- Presentation in the Cabinet of the interministerial plan to combat legionellosis.
- Adoption of the national biodiversity strategy.
- Release of a Cabinet communication on the conservation and sustainable management of tropical forests.
- Hosting by Burkina Faso of a Summit of French-speaking countries on sustainable development.
- Holding of the 15th conference of the Pacific Regional Environment Programme in Papeete.
- Issuance of a decree transforming IFEN, into a national agency reporting directly to the minister for ecology and sustainable development, as of 1 January 2005.
- Issuance of a decree defining eight areas of activity for the state's decentralised agencies. The "environment and sustainable development" area involves the Regional Environment Directorates (DIREN), Regional Industry, Research and Environment Directorates (DRIRE), Water Agencies, Higher Council on Fisheries, National Hunting and Wildlife Office, national parks, Coastal Conservatory, National Forestry Office, Environment and Energy Management Agency.

- Issuance of instruction by the Prime Minister to four regional prefects to conduct an experimental merger of the DIREN and DRIRE.
- Introduction of an energy bill, after a national debate on the subject.
- Adoption of the plan to modernise inspections of classified installations for pollution and industrial risks.
- Announcement of a national earthquake risk prevention programme.
- Passage of the law transposing the EU Water Framework Directive.
- Ruling by the European Court of Justice condemning France for failure to comply with the EU Urban Waste Water Directive.
- Issuance of a circular on implementation of government water policy in the départements and organisation of the Water and Aquatic Environments Police.
- Launching of HYDRO, the national online hydrological database.
- Establishment of a Natural Heritage and Biodiversity Science Council under the aegis of MEDD, and of regional natural heritage science councils.
- First reading in the National Assembly of a rural development bill, containing a section on wetlands.
- Issuance of an order confirming the Prime Minister's consideration of the proposal to designate the Hauts de la Réunion area as a national park.
- Issuance of a Cabinet communication on coastline conservation policy.
- Delivery to MEDD of a report from a national monitoring committee on exceptional water discharges from power stations.

Reference VI
SELECTED ENVIRONMENTAL WEB SITES

Web site	Host institution
www.ecologie.gouv.fr	Ministry of Ecology and Sustainable Development
www.industrie.gouv.fr/energie/sommaire.htm	Ministry of Economy, Finance and Industry
www.effet-de-serre.gouv.fr	Interministerial Task Force on Climate Change
www.ifen.fr	French Environment Institute
www.ademe.fr	Environment and Energy Management Agency
www.drire.gouv.fr/national/environnement	Regional Industry, Research and Environment Directorates
www.citepa.org	Interprofessional Technical Centre for Air Pollution Studies
www.ineris.fr	National Institute of Industrial Environment and Risk
www.lesagencesdeleau.fr	Water Agencies
www.rnde.tm.fr	National Water Data Network
www.conservatoire-du-littoral.fr	Conservatory of Coastal and Lakeshore Areas
www.ifremer.fr	French Research Institute for Exploitation of the Sea

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