OECD Environmental Performance Reviews

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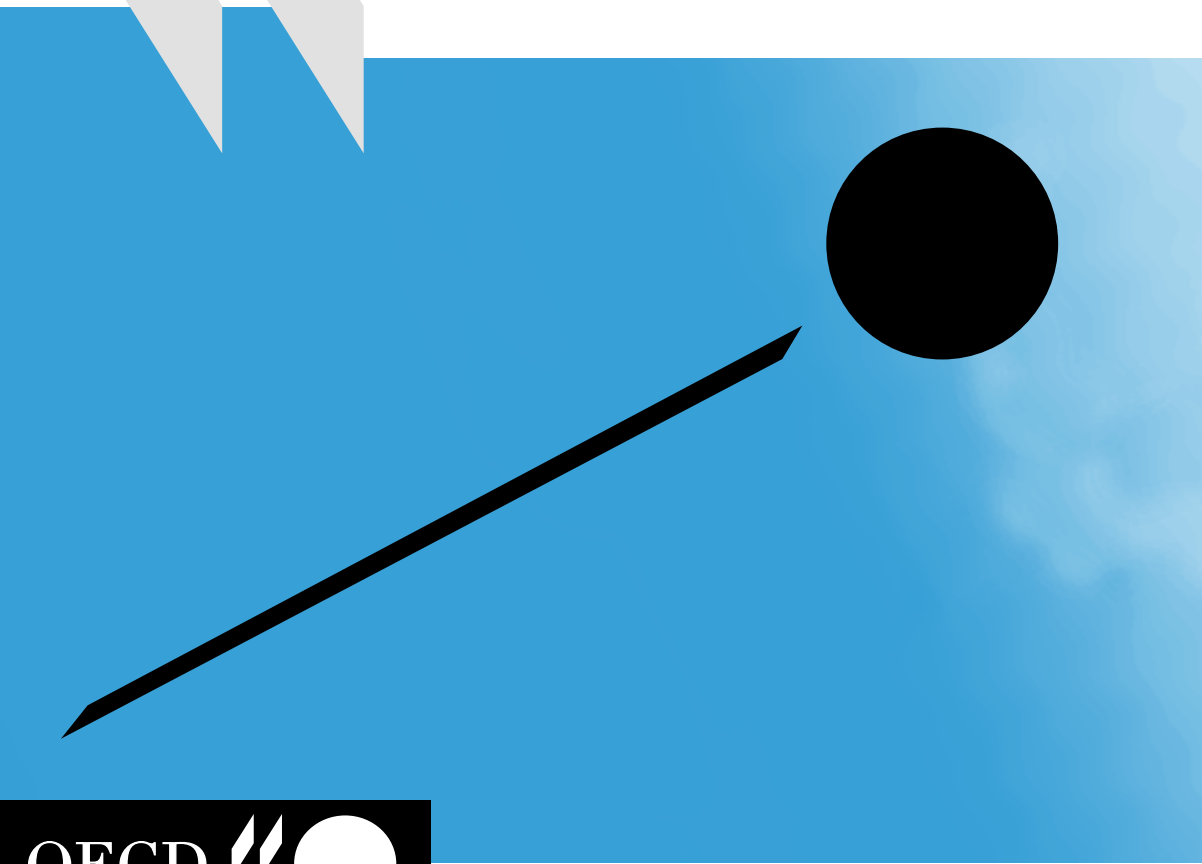

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FOREWORD

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

The OECD Working Party on Environmental Performance conducted the review of Belgium at its meeting on 25 September 2006 and approved its conclusions and recommendations.

Lorents G. Lorentsen
Director, Environment Directorate

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Signs

The following signs are used in Figures and Tables:

.. : not available

– : nil or negligible

. : decimal point

The sign * indicates that not all countries are included.

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).

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Country aggregates may include Secretariat estimates.

Currency

Monetary unit: euro (EUR)

In 2005, EUR 0.805 = USD 1.

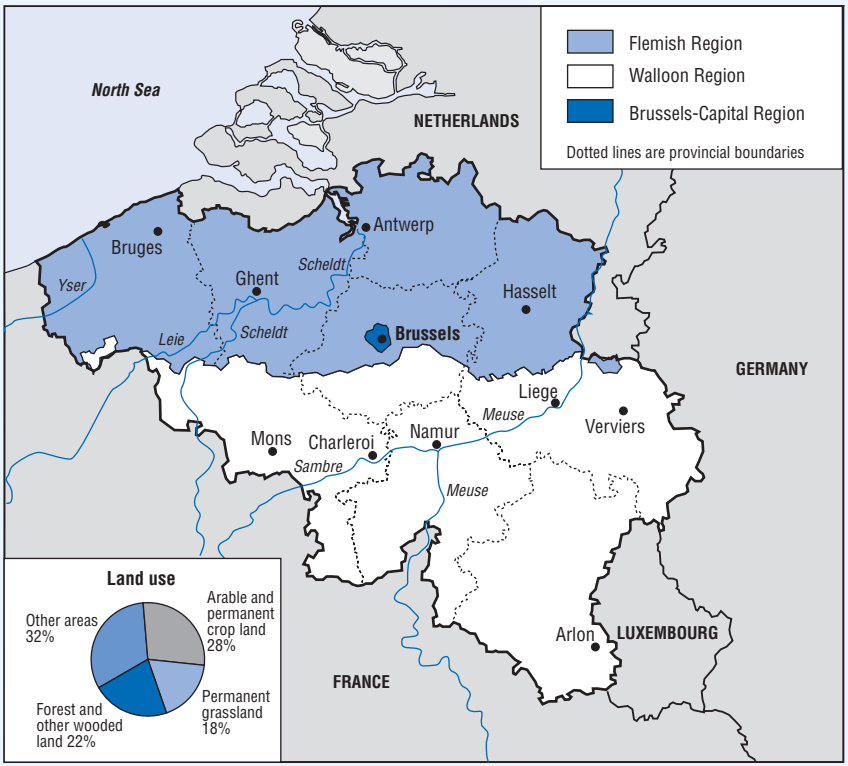
Cut-off Date

This report is based on information and data available up to September 2006.

LIST OF TEAM MEMBERS

Ms. Barbara Engels	Expert from reviewing country: Germany
Mr. Hugi Olafsson	Expert from reviewing country: Iceland
Ms. Véronique Deli	Expert from reviewing country: Mexico
Mr. Christian Avérous	OECD Secretariat
Mr. Gérard Bonnis	OECD Secretariat
Mr. Tsuyoshi Kawakami	OECD Secretariat
Mr. Eduard Goldberg	OECD Secretariat (Consultant)
Mr. Michel Potier	OECD Secretariat (Consultant)

Map of Belgium



Source: OECD Environment Directorate.

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CONCLUSIONS AND RECOMMENDATIONS*

This report examines Belgium's progress since the previous OECD Environmental Performance Review in 1998 and the extent to which the country is meeting its *domestic objectives and international commitments* regarding the environment.** The progress made by Belgium during the review period is seen in the report as resulting from the authorities' environmental and economic decisions and actions, as well as from the efforts of private enterprises, households and non-governmental organisations. Forty-seven recommendations are made that could contribute to further environmental progress in Belgium.

In a country as densely populated and economically developed as Belgium, *pressures on the environment are strong*. As much as one-fourth of the territory is built-up or covered with dense networks of roads, railways and navigation canals. Industry, heavy freight and passenger traffic, and intensive livestock production and crop cultivation also put pressure on the air, soil, water resources and nature. In this context, making development economically, environmentally and socially sustainable is a challenge. Because of Belgium's very open economy (exports reaching 83% of GDP and imports 81%), and its location, there are many physical and economic interdependencies among Belgium, its European partners and beyond. This explains the very proactive attitude of Belgium concerning international environmental issues.

In the period leading up to 1993, Belgium went through a series of institutional reforms which transformed it into a federal state made up of three regions and three linguistic communities. Since then, environmental responsibilities have been clearly

* Conclusions and Recommendations reviewed and approved by the Working Party on Environmental Performance at its meeting on 25 September 2006.

** The report also reviews Belgium's progress in the context of the OECD Environmental Strategy. The Objectives of the "OECD Environmental Strategy for the First Decade of the 21st Century" are covered in the following sections of these Conclusions and Recommendations: maintaining the integrity of ecosystems (Section 1), decoupling of environmental pressures from economic growth (Sections 2.1 and 2.2), and global environmental interdependence (Section 3).

defined and the federal, regional, community and local authorities have done a great deal to accelerate efforts to reduce pollution, protect nature and biodiversity, and also promote sustainable development.

However, Belgium is still catching up on the *environmental backlog from the past*. The challenge now will be to: i) pursue efforts to implement environmental policies effectively and efficiently; ii) further integrate environmental concerns into economic and social decisions; and iii) meet the country's international environmental commitments.

1. Environmental Management

Strengthening the implementation of environmental policies

After periods of uncertainty and of major environmental reforms associated with the process of federalisation of the country, Belgium's federal and regional authorities were able, during the review period, to build on: i) *stable environmental institutions* with a clear division of responsibilities and mechanisms for co-operation, ii) *EU environmental legislation* as well as the country's international commitments, and iii) *co-operation and partnership* with industry, trade unions and environmental NGOs. Total expenditure on pollution abatement and control grew significantly, reaching about *1.7% of GDP*. Nature protection also progressed, with the extension of protected areas in the context of the Natura 2000 network, despite the very high densities of population, activities and infrastructure of the country. Well established regional environmental administrations now all have *planning cycles*, indicators of progress and policy review mechanisms, and all have implemented *advanced environmental policies*. Federal authorities have exercised their responsibilities (e.g. ecotaxes, product standards, trade matters, international matters, radiation protection and protection of the marine environment). Better environmental management was achieved through a *mix of policy instruments*, including economic instruments, information campaigns, agreements (between the regions, provinces and municipalities), regulations (which were codified or streamlined) and voluntary actions (taken by industry). *Inspection authorities* improved their effectiveness and efficiency. Progress with single permitting and the use of environmental impact assessment was noteworthy. All these efforts have contributed to *partly repay the country's outstanding environmental debt*.

However, a number of indicators show that the results are not sufficient. Energy use, material use and pollutant emission *intensities* (i.e. per unit of GDP) remain relatively high. Indicators of *densities* of environmental pressures (i.e. per

km^2) are also very high. Addressing this will require Belgium to strengthen and/or extend its environmental efforts and to make them more cost-effective by increasing the use of *economic instruments* (e.g. taxes, charges, emission trading mechanisms) and *economic analysis* (e.g. cost-benefit analysis), notably for air, water and waste management. Belgium has still not fully implemented all EU environmental directives. The mix of policies covering waste management could often be more efficient. *Voluntary approaches* could often be more ambitious. *Land-use legislation*, *planning* and *policy*, which formally address environmental concerns, need to do so more widely in practice, to better control urban sprawl and the loss of green spaces.

Recommendations:

- increase the use of *economic instruments* (e.g. taxes, charges, trading mechanisms) and *economic analysis* (e.g. cost-benefit analysis);
- strengthen the review by regional authorities of municipal *land-use plans* to increase their effectiveness in addressing environmental objectives; strengthen *co-operation among regions* in land-use planning and environmental impact assessment;
- strengthen environmental *inspectorates*; increase their effectiveness and efficiency, where appropriate;
- review the experience with *partnerships* between government and non-governmental organisations (e.g. industry, trade unions, environmental NGOs) to see how such partnerships can be made more ambitious, cost-effective and transparent and how they can be associated with other instruments.

Air

Overall, Belgium made good progress over the review period in reducing air emissions. The *adoption of best available technology* significantly reduced emissions from the *industrial sector*. *SO_2 emissions* were further decoupled from economic growth. Nearly all air management objectives for *hazardous substances* were met (e.g. targets met for 20 of 22 substances regulated by the North Sea Conference, including dioxins) and further targets have been set. Ammonia (NH_3) emissions have been falling since 2000 as a result of livestock limitations and

application of low emission standards for manure treatment. Concerning electricity production, emission reduction targets set under a *voluntary approach* were all met (SO_2 reduced by 92% and NO_x by 66% between 1980 and 2003), and a further target was agreed. The National Emission Ceiling (NEC) target for *VOCs from transport* was met thanks to fuel regulations and a switch to diesel vehicles. The last ten years also saw significant improvement in establishing air *monitoring networks*. Both federal and regional authorities have recognised the importance of improving the availability of public transportation, and several new projects are envisaged (e.g. the Diabolo project to establish a direct rail link between the Brussels airport and several large towns).

However, further efforts are needed to reduce the emissions of certain substances and to capture related economic health benefits (e.g. reduced health expenditure and higher labour productivity). Reducing *PM* emissions (e.g. from the transport and industrial sectors) should be given higher priority with particular attention to $PM_{2.5}$ and health effects. In spite of good progress in reducing *NO_x* from stationary industrial sources, the NEC target will not likely be met. The ground level *ozone* air quality standard was exceeded a dozen times during the summer of 2003, and no improvement has been observed. NEC targets for SO_2 and

Recommendations:

- strengthen measures to reduce *PM* emissions, especially from the transport sector (e.g. fuel quality control, stricter car inspection for diesel vehicles);
- boost efforts to reduce *ozone* episodes; reduce emissions of NO_x, VOCs, PAHs and trichlorobenzene; consider additional measures to reduce *household emissions* (e.g. PAHs, NMVOCs);
- better control air pollution from *ocean and inland navigation* (e.g. fuel quality standard);
- evaluate and implement policy mixes (including use of economic instruments) to *improve the efficiency of air quality management*);
- adopt a *national transport plan* and ensure that the various (e.g. federal and regional) transport plans are consistent, mutually supportive and well implemented;
- develop *transportation* pricing and taxation (e.g. excise tax on fuel, road pricing) to help internalise the environmental damage costs;
- improve *energy efficiency* in all sectors, with special attention to the building sector.

NO_x transport emissions are not likely to be met in 2010 without additional measures. Overall, Belgium has found it harder to implement measures to reduce air emissions from household (residential and mobile emissions) sources than from industrial stationary sources. Federal and regional *transport policies* are not well co-ordinated and air pollution from road transport is increasing. Measures are also needed to reduce emissions from *ships*. Though highly subsidised, *public transportation* is losing ground compared with private vehicles. Attention should be given to developing an appropriate *policy mix* (e.g. including economic instruments such as higher diesel fuel taxes and road pricing). The *energy intensity* of Belgium is relatively high and should be reduced. In particular, energy efficiency in the building sector should be improved.

Water

Thanks to the concerted effort of the three Belgian regions, the share of the population connected to a *waste water treatment* plant grew from 26 to 46% over the last decade. As a result, the concentration of pollutants in many surface waters dropped, and aquatic life became more abundant. The clean-up of contaminated sediments in Flemish water courses proceeded according to plan. Further reforms in the *financing of water infrastructure* led to a more consistent application of the polluter pays principle. Overall, Belgium's pricing policy reflects that *water is an economic commodity with a social dimension*. *Industrial discharges* to water continued to decline. The reduction targets set by the International Conference on the Protection of the North Sea were achieved for 25 out of 37 substances. The federal government adopted *new laws* to protect the marine environment. Flanders adopted a decree on integrated water policy and Wallonia codified its water laws. Implementation of the EU Water Framework Directive was actively pursued by all relevant federal, regional and local administrations, including in the international basins of the Scheldt and Meuse rivers. Belgian administrations reviewed and updated their approach to *reducing flood hazard*.

Yet despite these efforts, *Belgium still faces major water pollution challenges*. First, the very intensive *agriculture* found in parts of Belgium (with indicators of livestock density and use of pesticides and nitrogenous fertilisers among the highest in the OECD) continues to have a very deleterious impact on the country's water resources. A large and increasing proportion of groundwater aquifers have high levels of *nitrates* and *pesticides*. Although progress was made over the review period in implementing the EU *Nitrates Directive*, Belgium's current policies for reducing nutrient loads are unlikely to be sufficient to meet

the directive's targets. Second, *water quality* in many streams and rivers, notably in the more densely settled parts of the country, is still far below what will be required by 2015 under the EU Water Framework Directive. The share of bathing waters that satisfy EU standards is not as high as in many other EU countries. The concentrations of nutrients, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), lindane and organotin compounds in coastal waters are of some concern. Third, despite its efforts, Belgium has not met the deadlines of the EU *Urban Waste Water Treatment Directive*. Public and private expenditure on waste water management, at 0.50% of GDP, remains low in view of the effort needed to eliminate the infrastructure backlog. A considerable investment in sewerage systems will be needed in the years to come. Delays have been due partly to the difficulty of building new infrastructure in densely settled areas, but also to a lack of co-ordination in planning treatment stations and sewerage networks. Moreover, the current share of combined systems in the country's sewerage networks, which allows the undesirable entry of storm water into sewers, compromises the investment in treatment stations. Progress toward full cost recovery of waste water expenditure has been slow and is not likely to be achieved soon.

Recommendations:

- review and revise *manure management and fertiliser use policies* in order to further reduce nutrient loading of ground and surface waters;
- bolster current efforts to reduce *pesticide* contamination of water sources (e.g. by increasing the rate of the existing pesticide tax);
- maintain the recent acceleration of construction of *waste water infrastructure*, including upgrading existing sewerage networks; ensure that financing arrangements do not slow progress; improve synchronisation in the construction of regional waste water treatment and municipal sewerage infrastructure;
- firmly implement measures to achieve full *cost recovery of sewerage and waste water activities* through "polluter pays" charging systems, with due regard to social concerns;
- speed up the *provision of sewage treatment* for all dwellings outside zones served by public systems;
- formulate measures to identify and remove remaining and new sources of *hazardous substances*.

Nature and biodiversity

During the review period, Belgium stepped up very significantly its efforts to protect nature and biodiversity. A comprehensive assessment of biodiversity and inventory of species was completed. *Protected areas* were expanded and now cover 11.6% of the country. Wallonia designated new nature parks and other protected areas, the Brussels-Capital Region set up a "green and blue network", and Flanders established a legal framework for development of the Flemish Ecological Network, of which about 70% has been designated. Nearly 13% of the national territory was designated as part of *Natura 2000*, providing new opportunities to combat fragmentation of habitats, expand protected areas and further involve stakeholders (farmers, forest owners) in nature conservation. Co-operation agreements led to establishment of "chartered reserves" and nature conservation on military domains. Implementation of *sustainable forest management* was actively pursued, and forest certification increased. Belgium contributed to *international co-operation* concerning migratory species (e.g. designating more Ramsar sites) and trade in endangered species (e.g. stepping up controls and penalties for CITES violations).

Recommendations:

- complete the *National Biodiversity Strategy* (as required under the UN Convention on Biological Diversity) with close co-operation between regional, federal and local authorities and stakeholders; include quantitative targets, as appropriate;
- strengthen the *management of protected areas* (e.g. new nature parks, agreements with landowners and/or land users) and the *connectivity between protected areas* in the context of Natura 2000, including through enhanced regional co-operation; extend biodiversity corridors by improving the ecological water quality of rivers, as required by the EU Water Framework Directive;
- enhance *nature conservation on farmland*; set targets and periodically evaluate achievements;
- promote *common forest management* among private forest owners, so as to create economies of scale and foster environmentally-friendly land use, thereby enabling sustainable forest management;
- enhance public and private *financing of nature and biodiversity conservation* (e.g. hunting plans and fees to control large game populations, local nature tax on building permits);
- further *implement international agreements* to protect nature and biodiversity (e.g. CITES, CBD).

However, economic activities in the context of Belgium's very high densities of population (341 inhabitants/km^2) and roads (488 km/100 km^2) exert high pressures on species and habitats, and *the loss of biodiversity is increasing*. If Belgium is to halt biodiversity loss on its territory by 2010 (an EU target adopted in 2001), much needs to be done to further protect species and habitats, expand marine protection, continue with sustainable forestry and better integrate nature concerns into agriculture and land use. The management of protected areas generally needs to be improved and their protection objectives made more explicit (e.g. nature parks in Wallonia). Efforts to combat fragmentation should be continued. Financial resources for biodiversity need to be significantly increased and *economic instruments* more widely used. The biodiversity objectives of the federal plan for sustainable development need to be followed up by federal biodiversity action plans, and regional comprehensive packages of actions focusing on sustainable agriculture, sustainable forestry and habitat protection should be further developed and implemented.

2. Towards Sustainable Development

Integration of environmental concerns into economic decisions

Belgium made progress over the review period in *decoupling* environmental pressures from economic growth for some conventional pollutants (e.g. SO_x and NO_x emissions) and for water abstractions. Growth in household waste for final disposal was also decoupled from economic growth due to high rates of recycling. *Sustainable development institutions* were developed at the federal level (Sustainable Development Law, establishment of a governmental committee and of a council for sustainable development, creation of a Secretary of State position for sustainable development). Two federal plans were adopted along the three pillars of sustainable development, together with evaluation and consultation procedures. Principles of sustainable development were also embodied in the regional environmental plans. The regional governments made some progress in *integrating environmental concerns into agriculture* (by augmenting support for agri-environmental measures). *Climate change policy* is moving ahead with the regional climate change plans and national burden-sharing agreement, and through a range of domestic measures, participation in the EU emission trading scheme and the Kyoto Protocol flexibility mechanisms.

However, there is still a need to decouple *road freight transport* from economic growth, as the increase in road freight transport is of high concern. *Energy intensity* (total primary energy supply per unit of GDP) is still considerably higher than in neighbouring countries. Integration of environmental concerns into energy policy is

lagging. Energy prices should internalise environmental external costs. *Pressures on water and soil resources* (from water abstractions, nitrate and pesticides) are *among the highest in the OECD*. The targets to expand *organic agriculture* have not been met. A number of tax concessions lead to perverse effects on the environment. No action has started on a *green tax reform* as recommended in the last OECD environmental performance review. The effectiveness and economic efficiency of the country's subsidy schemes for rewarding environmental behaviour may need to be reviewed. Quantitative targets are needed and cost-benefit analysis should be used more systematically for setting priorities.

Recommendations:

- establish a *green tax commission* and review, and if necessary revise, the relevant taxes and other economic instruments to improve their effectiveness and economic efficiency; review systematically the environmental effectiveness and economic efficiency of the country's financial assistance schemes;
- further implement the federal plan for *sustainable development* (2004-08); develop and implement a national strategy for sustainable development, in line with UN commitments;
- set *quantitative targets* for the environment in relevant planning (e.g. economic and sectoral); make further use of economic analysis for setting environmental and sustainable development priorities;
- further *integrate environmental concerns into sectoral policies* (e.g. energy, transport, agriculture) through strategic environmental assessment and development of market-based mechanisms; further implement policy and measures to improve *energy efficiency*;
- strengthen *institutional co-operation* between departments and between federal and regional governments, in particular as regards the environment-energy interface;
- conduct a *comprehensive review of climate* mitigation measures beyond the EU emission trading scheme.

Integration of environmental and social decisions

Innovative pricing and financing instruments now help ensure *access for all to essential environmental services* such as water services. Water pricing differentiates between (low-priced) essential uses and (high-priced) luxury uses.

Belgium can be considered to be fully implementing the *right to water* in its internal legislation. People in need will not be disconnected and the price of water will be affordable to poor households. Wallonia will introduce a tax on billed public water supply to finance development assistance in the water sector. Concerning *environmental information*, environmental data collection and publication improved substantially at regional and federal levels, leading to high quality *environmental reporting*, to more evidence-based and outcome-oriented environmental governance, and to performance-oriented planning. Concerning *environmental awareness* and related action, much has been done at federal, regional, community and local levels, including: communication campaigns, financial transfers to local authorities, voluntary regional-municipal covenants, and support for innovative waste prevention and eco-consumption projects. The voluntary regional-municipal covenants are particularly innovative. Several *partnerships* with private enterprises, trade unions, local authorities and environmental NGOs have succeeded in improving environmental management. Environmental work by NGOs has often received government financial support. Directly or indirectly, the environmental sector contributes to *employment* in Belgium, and related jobs increased by about 10% over the review period.

However, *access to environmental information* is hindered by being so widely dispersed among a multiplicity of sources in the federal, regional and provincial administrations. Citizens also need to be better informed about their rights

Recommendations:

- continue to improve *access for all to environmental information*, and improve the *comparability* of information among regions;
- increase citizens' *access to justice* in environmental matters;
- implement the user-pays principle for environmental services (water, waste) while continuing to give access to these services to *the poor*; consider extending fiscal incentives for energy-saving building insulation;
- continue to develop *environmental education*, particularly at higher education levels;
- continue to *develop partnerships with NGOs* and further involve local volunteers in managing protected areas, including in densely populated areas;
- further analyse the impacts of environmental policy on *employment in Belgium*.

concerning access to information and to courts in environmental matters. Public consultation could be improved by allowing more time to take comments into account. *Environmental education* could be further improved, especially at higher education levels (e.g. university level), to increase *eco-consumption*. Energy efficiency and use of public transportation could be increased. Available information on the *impact of environmental policy on employment* in Belgium is not sufficient to support a better integration of environmental and employment policies.

Health and environment

Belgium has vigorously taken up the challenge posed by the growing concerns about health and environment (e.g. growing numbers of respiratory diseases, asthma, allergies, cancers and obesity). The *federal government, regions and communities* closely collaborate on environmental health issues and have signed a co-operation agreement with the force of law. At all levels, the governments give importance to *science-based* assessments, providing *information* to the population, the *precautionary principle*, *planning and action*. During the review period they adopted the National Environment and Health Action Plan (NEHAP), which will soon include measures on children's environmental health (CEHAP), and established a permanent management structure to carry out joint research and monitoring. The federal government now includes environmental health in its responsibilities for *product standards*. Brussels-Capital is implementing a noise abatement plan and participates in an international project on air pollution and health. Flanders included environmental health outcomes in its most recent environmental policy plan and has since 2002 been implementing an environmental health action plan; it has also initiated an extensive, ongoing human biomonitoring survey. Wallonia is developing a regional environmental health action plan with a series of indicators and plans to adopt a regional noise abatement plan, as well as a nutrition and health plan. All three regions have established services to provide diagnostic assistance in cases where the *indoor environment* is suspected of causing health problems. Good work is also being done in public awareness-raising and *education* about health and environmental issues, including the health benefits of access to nature.

Still, Belgium has yet to marshal all the elements needed to set *priorities* in this field efficiently. Environmental risk factors are implicated in the main causes of mortality (e.g. cardiovascular diseases, cancer, respiratory diseases). The *economic aspects of the environment-health interface*, essential to identifying the cost of diseases and the benefits of action, is still largely absent in the research and monitoring now taking place, although public health expenditure represents 9.6%

of GDP and is growing. In particular, work is needed on *fine and very fine particles* in ambient air. The number of annual *ozone* episodes will need to be brought down substantially if Belgium is to stay within the 25-day maximum set for 2010 by the EU Ozone Directive. Progress is also needed in reducing *noise*, including that from road transport, railways and airports. Regarding water quality, *nitrates in groundwater* are a widespread problem as many aquifers show a nitrate content close to the limit of 50 mg per litre. High *pesticide* concentrations in some aquifers also pose problems for the drinking water supply. Pesticide use per unit of agricultural area remains the highest in OECD-Europe.

Recommendations:

- further develop and firmly *implement the NEHAP and CEHAP*; specify appropriate *environmental health outcomes* and incorporate these in the plans of all governments;
- build on the current *co-operation among federal, regional and community entities to address environmental health issues*; in particular, strengthen research on and monitoring of the link between exposure to environmental conditions and human health, including multi-factorial effects;
- analyse the *costs and benefits* of environmental health policies;
- ensure that *data collection efforts* focus on policy-relevant information and establish mechanisms to transfer policy-relevant research to policy makers; consider extending the Flemish biomonitoring programme to cover the whole country;
- continue to strengthen the possibility for the *public to make balanced decisions* on health and environment, e.g. through education, product labelling and information campaigns;
- place greater emphasis on public *access to green urban areas* in land-use planning policies.

3. International Co-operation

In recent years, Belgium has improved its record in ratifying international agreements and in transposing EU Directives, and has reduced delays in ratification processes as a result of enhanced co-ordination between federal and

regional authorities on international issues. Concerning *marine issues*, Belgium initiated "sea-use planning" and the creation of marine parks in its newly designated exclusive economic zone, following ratification of the Law of the Sea in 1999. Aerial surveillance of illegal discharges at sea was extended (Bonn Protocol); the control of ships calling at Belgian ports was improved to comply with the Paris Memorandum of Understanding on port state control; and efforts were made to strengthen oil spill preparedness, response and control. Concerning *trade*, with a very open economy, Belgium actively promotes multilateral approaches to trade/environment issues, implementation of specific multilateral environmental agreements, and an EU policy to import tropical timber from certified forests. Over the review period, *CO_2 emission intensity* decreased and Belgium prepared for timely implementation of the new *EU emission trading scheme*, including by creating a national greenhouse gas registry. A comprehensive national climate plan is being prepared building on a national burden-sharing agreement. *Belgium's official development assistance* increased from 0.35% of gross national income in 1998 to 0.53% in 2005.

However, integration of *climate change* objectives in energy policy could be strengthened: the impacts of energy pricing and of the energy mix on mitigation should be further assessed, a CO_2 tax is no longer envisaged, and there is a

Recommendations:

- adopt and implement the comprehensive *National Climate Plan*, taking account of the National Allocation Plan, reviewing reliance on buying credits on external markets and other flexibility mechanisms, and maximising synergies between federal, regional and sectoral policies and measures;
- integrate objectives related to climate change in *energy and transport policies* (e.g. energy efficiency, energy pricing and taxation, transport pricing and taxation);
- enhance protection of *marine ecosystems*, e.g. through creation of new marine nature reserves; continue efforts to reduce pollutant releases into the North Sea, by increasing urban waste water treatment and reducing agricultural run-off;
- strengthen efforts to prevent illegal trade of *ozone-depleting substances and hazardous waste*;
- increase the environmental component of *official development assistance* (e.g. water);
- proceed with pending *ratifications*, including through better co-ordination among Parliaments.

tendency to rely on buying credits on external markets to comply with Kyoto commitments. CO_2 emission intensity is still high by European standards and efficiency gains could be obtained by enhancing co-ordination of regional climate plans. Nitrogen loads in water bodies remain very high, and Belgium still has difficulty complying with the EU Nitrates Directive and *North Sea* commitments to reduce land-based sources of pollution. The share of *official development assistance* devoted to the environment (e.g. water) is low, and efforts should be made to ensure that bilateral and development co-operation by the regions does not erode the national focus on selected countries and sectors. Monitoring and inspection efforts concerning illegal *trade* (ozone-depleting substances, hazardous waste, endangered species) should be stepped up.

2

AIR AND WATER MANAGEMENT*

Features

- Good progress in reducing air emissions
- Remaining air quality problems
- Integration of air concerns into transport policies
- Internalising transport externalities
- Curbing the impact of intensive agriculture on water bodies
- Catching up on the backlog in waste water infrastructure
- Achieving cost recovery for waste water management expenditure
- Testing the international river basin approach of the EU Water Framework Directive

* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental. Performance Review of 1998. It also reviews progress with respect to the objectives of the 2001 OECD Environmental Strategy.

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the environmental performance review of Belgium:

Air

- strengthen measures to reduce *PM* emissions, especially from the transport sector (e.g. fuel quality control, stricter car inspection for diesel vehicles);
- boost efforts to reduce *ozone* episodes; reduce emissions of NO_x, VOCs, PAHs and trichlorobenzene; consider additional measures to reduce *household emissions* (e.g. PAHs, NMVOCs);
- better control air pollution from *ocean and inland navigation* (e.g. fuel quality standard);
- evaluate and implement policy mixes (including use of economic instruments) to *improve the efficiency of air quality management*);
- adopt a *national transport plan* and ensure that the various (e.g. federal and regional) transport plans are consistent, mutually supportive and well implemented;
- develop *transportation* pricing and taxation (e.g. excise tax on fuel, road pricing) to help internalise the environmental damage costs;
- improve *energy efficiency* in all sectors, with special attention to the building sector.

Water

- review and revise *manure management and fertiliser use policies* in order to further reduce nutrient loading of ground and surface waters;
- bolster current efforts to reduce *pesticide* contamination of water sources (e.g. by increasing the rate of the existing pesticide tax);
- maintain the recent acceleration of construction of *waste water infrastructure*, including upgrading existing sewerage networks; ensure that financing arrangements do not slow progress; improve synchronisation in the construction of regional waste water treatment and municipal sewerage infrastructure;
- firmly implement measures to achieve full *cost recovery of sewerage and waste water activities* through "polluter pays" charging systems, with due regard to social concerns;
- speed up the *provision of sewage treatment* for all dwellings outside zones served by public systems;
- formulate measures to identify and remove remaining and new sources of *hazardous substances*.

Conclusions

Air

Overall, Belgium made good progress over the review period in reducing air emissions. The *adoption of best available technology* significantly reduced emissions from the *industrial sector*. *SO_2 emissions* were further decoupled from economic growth. Nearly all air management objectives for *hazardous substances* were met (e.g. targets met for 20 of 22 substances regulated by the North Sea Conference, including dioxins) and further targets have been set. Ammonia (*NH_3*) emissions have been falling since 2000 as a result of livestock limitations and application of low emission standards for manure treatment. Concerning electricity production, emission reduction targets set under a *voluntary approach* were all met (SO_2 reduced by 92% and NO_x by 66% between 1980 and 2003), and a further target was agreed. The National Emission Ceiling (NEC) target for *VOCs from transport* was met thanks to fuel regulations and a switch to diesel vehicles. The last ten years also saw significant improvement in establishing air *monitoring networks*. Both federal and regional authorities have recognised the importance of improving the availability of public transportation, and several new projects are envisaged (e.g. the Diabolo project to establish a direct rail link between the Brussels airport and several large towns).

However, further efforts are needed to reduce the emissions of certain substances and to capture related economic health benefits (e.g. reduced health expenditure and higher labour productivity). Reducing *PM* emissions (e.g. from the transport and industrial sectors) should be given higher priority with particular attention to $PM_{2.5}$ and health effects. In spite of good progress in reducing *NO_x* from stationary industrial sources, the NEC target will not likely be met. The ground level *ozone* air quality standard was exceeded a dozen times during the summer of 2003, and no improvement has been observed. NEC targets for SO_2 and NO_x transport emissions are not likely to be met in 2010 without additional measures. Overall, Belgium has found it harder to implement measures to reduce air emissions from household (residential and mobile emissions) sources than from industrial stationary sources. Federal and regional *transport policies* are not well co-ordinated and air pollution from road transport is increasing. Measures are also needed to reduce emissions from *ships*. Though highly subsidised, *public transportation* is losing ground compared with private vehicles. Attention should be given to developing an appropriate *policy mix* (e.g. including economic instruments such as higher diesel fuel taxes and road pricing). The *energy intensity* of Belgium is relatively high and should be reduced. In particular, energy efficiency in the building sector should be improved.

Water

Thanks to the concerted effort of the three Belgian regions, the share of the population connected to a *waste water treatment* plant grew from 26 to 46% over the last decade. As a result, the concentration of pollutants in many surface waters dropped, and aquatic life became more abundant. The clean-up of contaminated sediments in Flemish water courses proceeded according to plan. Further reforms in the *financing of water infrastructure* led to a more consistent application of the polluter pays principle. Overall, Belgium's pricing policy reflects that *water is an economic commodity with a social dimension*. *Industrial discharges* to water continued to decline. The reduction targets set by the International Conference on the Protection of the North Sea were achieved for 25 out of 37 substances. The federal government adopted *new laws* to protect the marine environment. Flanders adopted a decree on integrated water policy and Wallonia codified its water laws. Implementation of the EU Water Framework Directive was actively pursued by all relevant federal, regional and local administrations, including in the international basins of the Scheldt and Meuse rivers. Belgian administrations reviewed and updated their approach to *reducing flood hazard*.

Yet despite these efforts, *Belgium still faces major water pollution challenges*. First, the very intensive *agriculture* found in parts of Belgium (with indicators of livestock density and use of pesticides and nitrogenous fertilisers among the highest in the OECD) continues to have a very deleterious impact on the country's water resources. A large and increasing proportion of groundwater aquifers have high levels of *nitrates* and *pesticides*. Although progress was made over the review period in implementing the EU *Nitrates Directive*, Belgium's current policies for reducing nutrient loads are unlikely to be sufficient to meet the directive's targets. Second, *water quality* in many streams and rivers, notably in the more densely settled parts of the country, is still far below what will be required by 2015 under the EU Water Framework Directive. The share of bathing waters that satisfy EU standards is not as high as in many other EU countries. The concentrations of nutrients, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), lindane and organotin compounds in coastal waters are of some concern. Third, despite its efforts, Belgium has not met the deadlines of the EU *Urban Waste Water Treatment Directive*. Public and private expenditure on waste water management, at 0.50% of GDP, remains low in view of the effort needed to eliminate the infrastructure backlog. A considerable investment in sewerage systems will be needed in the years to come. Delays have been due partly to the difficulty of building new infrastructure in densely settled areas, but also to a lack of co-ordination in planning treatment stations and sewerage networks. Moreover, the current share of combined systems in the country's sewerage

networks, which allows the undesirable entry of storm water into sewers, compromises the investment in treatment stations. Progress toward full cost recovery of waste water expenditure has been slow and is not likely to be achieved soon.

♦ ♦ ♦

1. Policy Objectives

1.1 Air pollution

Belgium's *air management objectives* are largely determined by its international commitments. These include the air quality objectives of the 1996 EU Air Quality Framework Directive. Belgium has transposed the directive's first three daughter directives into national law but not yet the fourth (2004).[1] The EU National Emission Ceiling Directive and the North Sea Conference also establish important emission reduction targets. Although Belgium has yet to ratify the Gothenburg Protocol, it has set quantitative emission reduction targets for 2010 for SO_2, NO_x, VOCs and NH_3 (Table 2.1). The Third Federal Scheme to Abate Acidification and Ground-Level Ozone (2004-07), the successor to the 1996-99 and 2000-03 schemes, sets policy targets for transport, energy, environment (product standards) and research (Table 2.2) and aims to reduce emissions of SO_2, NO_x and NMVOCs.

The *Brussels-Capital Region* adopted a plan for air quality improvement and global warming abatement (the Air-Climate Regional Plan 2002-10) in 2002. The plan brings together measures to improve ambient air quality and to reduce greenhouse gas (GHG) emissions by 2010. For air quality, the main objectives are to reduce emissions of ozone precursors (VOCs and NO_x), benzene (linked to petrol), fine particulates (PM_{10} and $PM_{2.5}$) and PAHs (linked to diesel and heating oil). Quantified emission reduction targets are included. The transport side of the plan was recently strengthened thanks to the implementation of the "Bruxell'Air programme".

Flanders adopted an environmental policy plan for 2003-07 in 2003. The plan aims at conducting an air policy that balances emission reduction and socio-economic impacts. It identifies three air pollution "themes": photochemical substances, acidification (e.g. SO_2, NO_x and NH_3), and environmentally hazardous substances (e.g. heavy metals, PAHs, dioxins and PM_{10}). The plan also addresses air pollution under the theme of fertilisation. An NEC reduction programme, adopted in 2003, contains measures to achieve the regional NEC targets for SO_2, NO_x, VOCs and NH_3 for stationary sources as well as the Flemish contribution for the transport sector. In 2005, a PM reduction programme was adopted with measures for stationary and mobile sources.

Table 2.1 **Performance regarding EU and other international air targets**

Pollutants	Protocols[a] 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	*–30*	1980-93	*–66*	1980-93
	Oslo	*–70*	1980-2000	*–80*	1980-2000
	Gothenburg[b]	*–72*	1990-2010	*–59*	1990-2003
	01/81/EC ceilings	99 kt	2010	151 kt	2002
NO_x				*+1 (stabilisation in 1995)*	
	Sofia	*0*	1987-94		1987-94
	Gothenburg[b]	*–47*	1990-2010	*–21*	1990-2003
	01/81/EC ceilings	176 kt	2010	290 kt	2002
VOCs	Geneva	*–30*	1988-99	*–34*	1988-99
	Gothenburg[b]	*–56*	1990-2010	*–37*	1990-2002
	01/81/EC ceilings	139 kt	2010	216 kt	2002
NH_3	Gothenburg[b]	*–31*	1990-2010	*–24.3*	1990-2001
	01/81/EC ceilings	74 kt	2010	81 kt	2001
Heavy metals					
Cadmium	Aarhus[b]	*0*	1990 cap	*–90*	1990-2000
	North Sea Conference	–50	1985-2000	–74	1985-2000
Lead	Aarhus[b]	*0*	1990 cap	*–66*	1990-2000
	North Sea Conference	–50	1985-2000	–85	1985-2000
Mercury	Aarhus[b]	*0*	1990 cap	*–78*	1990-2000
	North Sea Conference	–50	1985-2000	–88	1985-2000
POPs[c]					
Dioxins/furans[d]	Aarhus[b]	*0*	1990 cap	*–84*[e]	1990-2003
	North Sea Conference	–50	1985-2000	–79	1985-2000
PAHs	Aarhus[b]	*0*	1990 cap	*–43*[e]	1990-2002
	North Sea Conference	–50	1985-2000	–59	1985-2000
PCBs	Aarhus[b]	*0*	1990 cap	..	1990-2002

a) Protocols to the Geneva Convention on Long-range Transboundary Air Pollution.
b) Belgium has signed but not yet ratified the Aarhus and Gothenburg Protocols; base years are therefore provisional, to be confirmed during ratification.
c) Persistent organic pollutants. Includes eleven pesticides, two industrial chemical products and three by-products. Production ban: aldrin, chlordane, chlordecone, dieldrin, endrin, hexabromobiphenyl, mirex and toxaphene. Restricted use and long-term elimination: dichloro-diphenyl-trichloroethane (DDT), hexachlorocyclohexane (HCH, including lindane) and PCBs. Reduced emissions: dioxins, furans, PAHs and hexachlorobenzene (HCB).
d) Reductions achieved refer to dioxins only.
e) Flanders only.
Source: FPS Economy – Directorate-general Statistics Belgium; Management Unit of the North Sea Mathematical Models; Flemish Government – Statistics Planning Office; VITO; OECD.

Table 2.2 **Policy targets of the Third Federal Scheme to Abate Acidification and Ground-level Ozone,** 2004-07

Transport	drafting a national transport plan to manage transport needs, to encourage inter-modality, to improve public transportation, to minimise pollution, to promote environmentally-friendly fuels and means of transport; supporting company agreements and plans to make commuter train journeys free of charge; changing the technical inspection of cars to take account of environmental parameters; encouraging the greening of public procurement (buying vehicles with lower pollutant emissions).
Energy	supporting the rational use of fossil fuels by energy savings and by using renewable energy sources; improving the environmental quality of fuels; tax relief for energy-saving investments (replacing old boilers, installing solar panels).
Environment	improving the environmental performance of boilers by reducing NO_x emissions; informing consumers and professionals about energy-reducing technologies; improving the environmental performance of products that contain solvents (paint, varnish, ink).
Scientific research	financing research projects (e.g. measures that could be taken in the transport sector to reduce air pollution).

Source: FPS Health, Food Chain Safety and Environment, Belgium.

Wallonia adopted the "*Plan Wallon de l'Air*" in 2002 and related implementation guidelines in 2003. The plan identifies possible long-term measures to reduce air pollution in different sectors (e.g. agriculture, industry, tertiary sector and residential). It also allocated GHG emission quotas for the end of 2004 for Wallonia's 128 most polluting industries, to prepare for the European emission-rights trading market beginning in 2005.

1.2 Water pollution and flooding

Belgium's water management objectives during the review period were largely driven by international commitments and obligations such as EU directives, North Sea Conferences and OSPAR Convention, and international river-basin agreements for the Scheldt and Meuse rivers. Belgium's three regions bear most of the *responsibility* for fresh water management, whereas the federal government is responsible for protection of the North Sea and for setting product standards.

Several new *water laws* were passed during the review period. As part of its implementation of the UN Convention on the Law of the Sea, the federal government in 1999 adopted two laws to protect the Belgian part of the North Sea and its Exclusive Economic Zone. Flanders transposed the EU Water Framework Directive (WFD) in 2003 through the Decree on Integrated Water Policy. Wallonia codified its

water legislation in 2004 (also incorporating the requirements of the WFD) as part of an overall environmental code still being developed. Brussels-Capital had yet to transpose the WFD as of November 2005, but all three regions more or less kept to the timetable for the various implementation stages of the WFD (Box 2.1).

Box 2.1 **SCALDIT – Testing the international river basin approach of the EU Water Framework Directive**

Article 13 of the EU Water Framework Directive (WFD, 00/60/EC) requires the formulation, not later than the end of 2009, of a *single river basin management plan* for all international river basins falling entirely within the European Community. The competent authorities of each river basin district making up the international basin will therefore need to ensure the consistency of their respective river basin district plans. In 2002, the Scheldt was selected as a pilot basin to test the usefulness of the Common Implementation Strategy of the WFD.

As defined by the WFD, the *international river basin district* (IRBD) of the Scheldt comprises not only the river basins of the Scheldt, but also the basins of several smaller rivers in France (e.g. the Somme) and Belgium (the IJzer, Bruges Polders), and the adjoining coastal waters. The IRBD of the Scheldt has an area of 36 416 km^2 and a population of 12.9 million. The Scheldt river basin proper has an area of 22 116 km^2 and counts 10 million inhabitants. Just over half of the catchment of the Scheldt IRBD lies in France; about 44% is in Belgium and 6% is in the Netherlands.

The test basin project is named *Scaldit* (for Scaldis, the Latin name for Scheldt, and Integrated Testing). The Flemish Region (VMM) is the lead partner for the project; the other partners are: Brussels-Capital (IBGE-BIM) and Wallonia (DGRNE); for France, the Coordinating Prefect of the Artois-Picardie Basin and the Regional Directorate for Nord-Pas de Calais; and for the Netherlands, the Ministry of Transport and Water Management and the Province of Zeeland. In order to provide an institutional framework and an opportunity for follow-up, Scaldit is being carried out as an activity of the International Scheldt Commission, whose membership includes the federal government of Belgium and all project partners. The experience gained from this pilot project will later contribute to the development of management plans for other international river basin districts.

In December 2004, the project produced its *first attempt at a comprehensive analysis* including a characterisation of the surface, ground and coastal waters, an evaluation of driving forces and pressures, and an economic analysis of water use (as required under Article 5 of the WFD). This first attempt helped to identify some of the difficulties in carrying out a consistent analysis across national boundaries. For example, it proved hard to compare the physico-chemical and ecological water quality along the whole length of the Scheldt River. The Scaldit report now serves as the basis for a trans-national umbrella report for the drafting of a joint river basin management plan for the Scheldt IRBD. Another aspect receiving special attention in the Scaldit project is the link between water management and spatial planning.

In Flanders a series of comprehensive *environmental plans* (MINA) have been implemented, with objectives and targets organised under several themes. The objectives for water protection can be found under the themes of "pollution of surface waters", "disturbance of water systems" and "eutrophication" (Table 2.3). In 2004, Flanders also formulated a more extensive water policy statement aimed at integrating water policy with other domains such as the MINA plan, spatial planning and mobility policy. In Wallonia, generic water management aims are contained in the 2005 "contract for the future of Wallonia", whereas the 2004-09 regional policy statement sets forth the government's intentions with respect to *water tariffs* that are fair and that also promote water conservation. The Wallonia government has also adopted two detailed plans for nitrogen management in agriculture (PGDA, 2002) and flood prevention (PLUIES, 2003). In Brussels-Capital, the 2004 regional development plan includes generic environmental goals as part of a sustainable development approach.

As part of its responsibility for marine waters, the federal government is developing a "*North Sea master plan*". It has already designated several protected marine areas (Chapter 3) and has developed policies for sand and gravel extraction as well as for the siting of wind energy installations at sea. In 2005, the government also adopted a national plan for reducing the use of biocides (initially wood preservatives and rodenticides) and agricultural pesticides, one of the first EU countries to do so.

Belgium's environmental performance can be assessed not only with respect to its own national and regional objectives but also in the light of the recommendations of the *1998 OECD Environmental Performance Review* (Table 2.4). This chapter will show that efforts were made to address each issue raised in the recommendations, but that much unfinished business remains.

2. Air Pollution

2.1 Meeting air quality standards

Concerning SO_2, standards have been met at all measurement stations for many years (Figure 2.1, Table 2.5). Regarding NO_2, the alert threshold has not been triggered in Brussels in recent years, but the information threshold has occasionally been exceeded due to heavy traffic (Figure 2.1).

For *ground-level ozone* (O_3), standards were exceeded throughout the review period, although concentrations of some ozone precursors (e.g. VOCs) have been decreasing. Between 1998 and 2001, the 1-hr limit of 180 µg/m^3 was exceeded on 8 days in 1998, 13 days in 1999, 6 days in 2000, and 15 days in 2001. In 2003,

Table 2.3 **Performance regarding selected water quality targets**

Objective	Source	Performance as of mid-2005
Water: Federal Government		
North Sea Master Plan		Yet to be formally adopted, but first protected areas under EU Birds and Habitat Directives were gazetted in October 2005. The same month, mussels grown on the Belgian coast were harvested for the first time in many years
The 2005 National Pesticide Risk Reduction Plan aims to reduce the risk from agricultural pesticides by 25% between 2001-10 and the risk from biocides and non-agricultural pesticides by 50%.		Too early to assess performance.
Water: Wallonia		
The 2005 "Contract for the Future of Walloons" mentions protecting water intake areas, combating water pollution and treatment of waste water as elements for a sustainable management of water resources.		Goals are too generic to allow performance assessment, but action was undertaken on all of these items.
The 2004-09 Regional Policy Statement aims to establish a fair and efficient water tariff structure.		Coherent charging system was established that in due time will achieve full cost recovery. A Social Water Fund distributes revenue collected from water charges to low-income water users.
2002 Sustainable Nitrogen Management in Agriculture Programme (PGDA)		Too early to assess performance.
2003 Flood Prevention Plan (PLUIES)		Too early to assess performance.
Water: Flanders		
Theme: pollution of surface waters	MINA 1997-01	Achieved with some delay through the adoption of two new decrees in 2002 and 2003, the "water check" in 2005, and a water strategy in 2005.
– establishing integrated water management to achieve healthy river basins;		
– improving physico-chemical water quality and morphology of watercourses to enhance fish life;		While water quality has improved, only 2% of measuring stations met basic water quality standards. 29% had "good" to "very good" biological quality in 2003.
– preventing pollution and reducing discharges.		Point discharges from households and industry continued their steady downward trend throughout the review period (1997-2003). Agricultural discharges reversed their previous upward trend by 2000.
Theme: disturbance of water systems	MINA 2003-07	– 37% of monitoring sites met BOD quality in 2003;
– increase the number of measuring points that satisfy the basic quality for BOD to 66%;		– 29% of monitoring sites had good or very good biological quality in 2003.
– increase the number of measuring points that satisfy the biological quality standard to 40%.		

Table 2.3 **Performance regarding selected water quality targets** *(cont.)*

Objective	Source	Performance as of mid-2005
Water: Brussels-Capital		
The 2004 Brussels Regional Development Plan (PRD/GewOP) incorporates environmental goals (e.g. for air quality, noise and water) that enhance the quality of life in the region.		Goals are too generic to allow performance assessment.
Waste water and sewage sludge treatment: 20% by 2005 and 100% by 2008.		2005 target achieved; work in progress on 2008 target.
Improvement of water quality with regard to dangerous substances by March 2010 and implementation of the reduction plan for: – Polycyclic Aromatic Hydrocarbon PAH (0.1 µg/l); – Polychloro biphenyl-PCB and triphenyl-PCT (0.007 µg/l)		As of 2002, concentration of PAHs and organo-phosphate pesticides exceeded standards in the Senne and the Canal, concentration of PCBs exceeded standards in the Senne river and the Woluwe.

Source: Planning documents from Belgian authorities.

Flanders exceeded the 8-hr maximum target of 120 µg/m^3 on 65 days, the highest rate ever recorded. The AOT 40 value (Accumulated exposure Over Threshold of 40 ppb), averaged over five years, is currently respected and is expected to be respected in years to come. Regarding PM_{10}, the highest concentrations are found in industrial zones and in agglomerations with heavy traffic. The 2005 daily average limit value is not being met.[2] The 2010 target will be very difficult to meet under current conditions.

Regarding *carbon monoxide (CO)*, the threshold has generally been respected at all measurement stations, with maximum levels rarely exceeding 3 000 µg/m^3. Levels of *other substances* such as benzene, and B(a)P satisfy ambient air quality standards.

2.2 Further reducing air emissions

Overall, *good progress* has been made in reducing emissions (Table 2.4, Figure 2.2). In particular, Belgium's *adoption of best available technology* (BAT) has significantly reduced emissions from *industry*. SO_2 emissions have been further decoupled from economic growth. Air management objectives for hazardous substances are mostly being met. NH_3 emissions have been falling since 2000. The NEC target for SO_2 and VOCs will most probably be met.

Table 2.4 **Performance regarding the recommendations of the 1998 OECD Environmental Performance Review**

Recommendation	Performance as of mid-2005
Air pollution	
Take integrated and cost-effective measures to *reduce ammonia emissions* from animal husbandry.	NH_3 emissions have been falling since 2000 as the result of measures in the ammonia reduction and manure action plans. Approximately one-third of the drop is the result of the limitation on livestock, the rest from the application of low-emission treatment of manure. Efforts are still needed to meet NEC targets (especially in Flanders).
Strengthen current efforts to *reduce emissions of VOCs and some of the toxic substances* included in the agreements of the North Sea Conferences.	Significant reductions have been made in toxic substance emissions. Limits for 20 out of 22 substances regulated by the North Sea Conference have been met. More stringent targets have been set. The NEC target for 2010 for reducing VOC emissions from the transport sector has already been met.
Improve *energy efficiency*, taking a more proactive approach that includes setting tangible targets.	Various measures led to the gradual improvement of energy efficiency during the review period, but it is still lower than the OECD and OECD-Europe average. The national programme 2005-08 adopted under the EU Lisbon Strategy sets the national target of increasing energy efficiency by 1% annually.
Make *greater use of voluntary agreements* with industry to reduce emissions and improve energy efficiency.	Existing agreements with the electric industry have been successful and have been extended with stricter reduction targets. In the Walloon Region, participating firms represent more than 90% of the region's industrial energy consumption. In Flanders, benchmarking covenants for the 180 most energy-intensive companies and audit covenants for medium-sized energy-intensive companies have been decided, as well as a covenant with the only nitric acid producer on N_2O emissions. For sectors with many players, regulatory measures are preferred due to the difficulty of task allocation.
Give high priority to *strategic transport planning* including the promotion of public transport for passengers and the development of freight transport by other means than road.	Such planning has been well recognised in the Federal Plan for Sustainable Development 2004-08. However, insufficiently co-ordinated regional transport plans have led to inefficient implementation of measures. A national transportation policy plan needs to be established.
Continue to develop more rational *pricing and taxation of transport* to help internalise its environmental costs, for instance by raising *diesel fuel taxes* further.	Tax differentiation according to environmental performance has been used (e.g. solidarity contribution, eurovignette). The Federal Plan for Sustainable Development 2004-08 aims to further correct prices. Lowering registration taxes and making road taxes proportional to car use or CO_2 emissions has bee envisaged. Diesel fuel is still preferred – accounting for 70% of total vehicle fuel consumption – because it costs less than gasoline.
Improve emission *inspections* of in-use vehicles.	Yearly inspections are required for vehicles more than four years old. The Third Federal Scheme to Abate Acidification and Ground-level Ozone aims at changing the technical inspection of cars to take account of environmental parameters.

Table 2.4 **Performance regarding the recommendations of the 1998 OECD Environmental Performance Review** *(cont.)*

Recommendation	Performance as of mid-2005
Water pollution	
Strengthen *water conservation* efforts and reduce groundwater withdrawal by placing greater emphasis on demand management and by involving water utilities in achieving explicit objectives for efficient water use.	Drinking water companies were made responsible for the cost of treating the waste water generated by their customers, which will encourage demand management. By 2007, all households will be metered in Flanders. In Flanders, a permit is needed for the abstraction of groundwater. For each abstraction the risk of overexploitation or damage to the environment is studied. The permitted capacity is checked for compliance with BAT. In areas with a great groundwater shortage, drinking water companies are allowed to deliver grey water to companies. The necessary investments are partly financed by the government.
Further develop the system of *waste water charges* to better reflect the polluter-pays principle and reduce cross-subsidisation among users.	Arrangements for setting and collecting waste water charges were reformed to achieve a higher degree of cost recovery in the future. Currently, however, only about one-third of the total waste water cost is recovered through charges, and subsidies and cross-subsidies persist.
Further strengthen efforts to reduce industrial and municipal *point source discharges* to meet both regional and international requirements, including by attracting private financial means to increase the rate of investment in sewerage and public waste water treatment plants; increase financial and technological efforts in the private sector (industry and agriculture) to reduce pollution at source.	The rate of connection to sewage treatment plants grew from 26% to 46% over the past decade. However, none of the targets of the European waste water directive were met on time. There is some limited private capital participation in the regional companies Aquafin and SPGE.
Reduce the *nitrogen load* to water bodies, particularly from agriculture (commercial fertilisers and manure from intensive animal breeding).	In Flanders, nitrogen losses to water were reduced by 16% between 1997 and 2003. In Wallonia, use of mineral nitrogenous fertilisers was reduced by about 15% and use of phosphorus by about 30% over the same period.
Reduce the contamination of groundwater by *pesticides*. Seek reduction in the *use of pesticides* (recommendation in the chapter on the chemical industry).	A federal programme to reduce pesticide use and improve practices was started in January 2005. In Flanders, the sale of pesticides fell by 14% and estimated risk to aquatic life from pesticides in water bodies was reduced by 47% between 1990 and 2002. In Wallonia, the sale of pesticides fell by 30% (cereals) and 23% (sugar beet and maize) during the 1990s.
Seek to strengthen *stakeholder commitment* to the integration of water and other policies; explore further integration mechanisms; build on existing approaches to integrated river basin management and formulate clear objectives in each river basin.	The 2000 Water Framework Directive requires EU countries to do everything mentioned in the recommendation and Belgium is actively pursuing this approach. The "water check" in Flanders is an example of the integration of water policy in spatial planning.

Source: OECD, Environment Directorate.

Table 2.5 **Legal ambient air quality standards[a] for the protection of human health**

Pollutant	Value	Limit value (μg/m³)	Maximum number of overruns per year	Year of compliance
SO_2	Daily mean	125	3	2005
	1-hr mean	350	24	2005
NO_2	Annual mean	40	0	2010
	1-hr mean	200	18	2010
PM_{10}	Annual mean	40[b]	0	2005
	Daily mean	50	35[c]	2005
Lead	Annual mean	0.5	0	2005
Benzene[d]	Annual mean	5	0	2010
CO[d]	8-hr daily max	10 000	0	2005
Ozone	8-hr daily max	120	25	2010
As[d]	Annual mean	6 ng	0	2013
Cd[d]	Annual mean	5 ng	0	2013
B(a)P[d]	Annual mean	1 ng	0	2013
Ni[d]	Annual mean	20 ng	0	2013

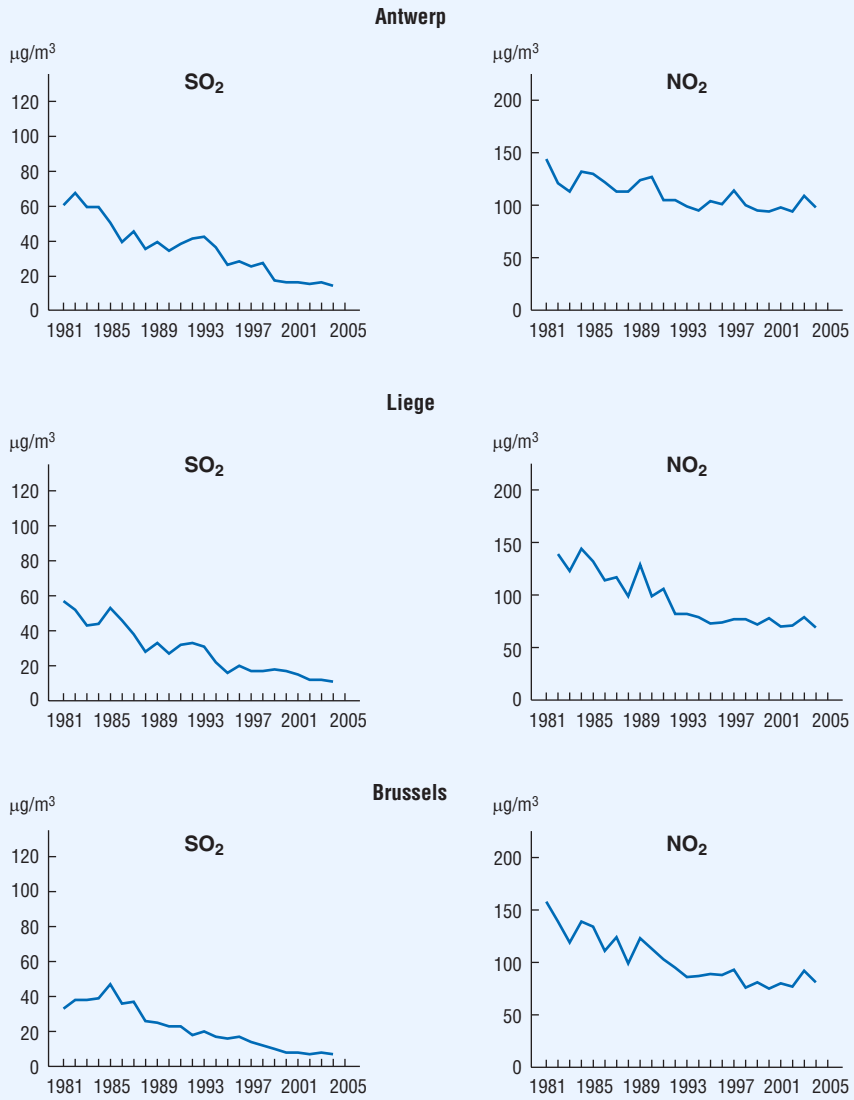
a) Directive 99/30/EC for SO_2, NO_2, PM_{10} and lead. Directive 00/69/EC for CO and benzene. Directive 02/03/EC for ozone.
b) 20 μg/m³ by 2010.
c) Maximum of seven breaches allowed per year by 2010.
d) Target value (limit value must be attained within a given period, while target values are to be attained where possible).
Source: European Union; Belgium.

However, *further efforts* are needed. Air pollution from the *transport sector* (e.g. NO_x, VOCs, PM) is decreasing due to European vehicle standards, but still more efforts should be made to meet the NEC and air quality standards. Reducing *PM* emissions from the transport sector should be given higher priority. The NEC targets for NO_x from transport are not likely to be met in 2010. The most important reason is higher emission factors for NO_x, but a high diesel share and transport growth also cause this problem. The target for *ground-level ozone* has been exceeded and trends have not improved.

Good progress

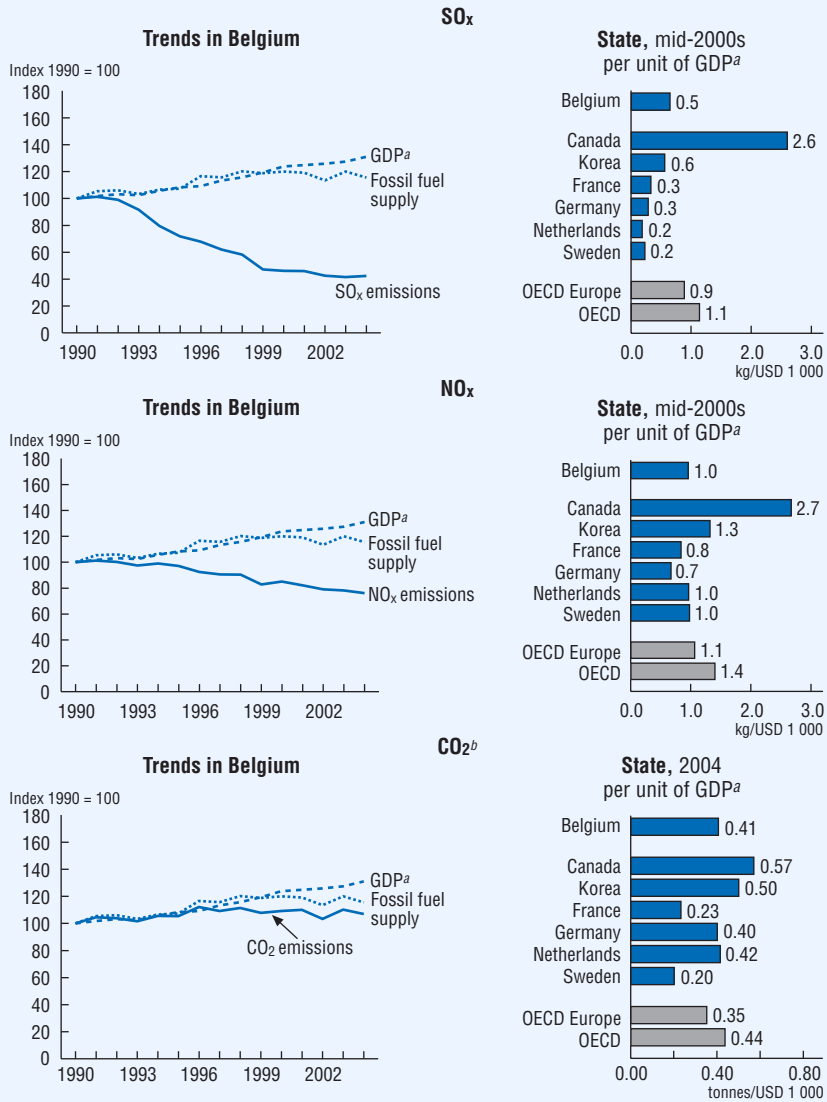
SO_2 emissions dropped by 27% between 1998 and 2004 and were further decoupled from economic growth. However, Belgium's SO_2 emissions per unit of GDP are in the middle range within OECD Europe and two to three times those of Germany, France or the Netherlands, despite fuel substitution and regulation of the sulphur content of fuels (e.g. EU norm since 1999) (Figure 2.2). SO_2 emissions

Figure 2.1 **Trends in urban air quality**[a]



a) SO_2 concentrations: average of daily means. NO_2 concentrations: 98th percentile of hourly means.
Source: IRCEL.

Figure 2.2 **Air pollutant emissions**



a) GDP at 2000 prices and purchasing power parities.
b) Emissions from energy use only; excludes international marine and aviation bunkers; sectoral approach.
Source: OECD Environment Directorate; OECD-IEA (2006), CO_2 emissions from fuel combustion; OECD (2005), OECD Economic Outlook No.77; OECD-IEA (2006), Energy Balances of OECD Countries 2003-2004.

produced by the energy, industrial and residential (space heating) sectors declined sharply, by 65%, between 1990 and 2003. The energy sector still accounts for 39% of SO_2 emissions, followed by energy consumption in industry (24%) and heating (23%). In the transport sector, SO_2 emissions dropped significantly (by 92% between 1990 and 2003), due mainly to the steady reduction in the sulphur content of fuels since 1996.

NO_x emissions dropped by 16% between 1998 and 2004, due mainly to improved performance in electricity production. Belgium's NO_x emissions per unit of GDP are in the middle range within OECD Europe and comparable to those of Germany, France and the Netherlands (Figure 2.2). The primary source of NO_x emissions in Belgium is transport (52% in 2003), followed by the manufacturing industries (18%) and energy industries (14%). Emissions from transport dropped by 21% between 1990 and 2003, due to the use of catalytic converters on petrol-engine cars (since 1993-94). In 2004, Belgium established emission limits by Royal Decree for NO_x and CO for all new (gas-fired and oil-fired) heating devices on the market; these limits are currently being revised. The goal is to reduce emissions by 25% by the end of 2010.

VOC emissions dropped by 17% between 1998 and 2002, due largely to a decrease in emissions from road transport, industrial processes and use of solvents. VOC emissions are caused mainly by the use of solvents and other products (38%), followed by combustion of petrol for transport (26%), industrial processes (13%), and fugitive emissions from fuels (12%). Belgium will meet the NEC target for VOCs from transport due to fuel regulation and changeover to diesel vehicles.

NH_3 atmospheric emissions have decreased since 2000 thanks to manure action plans and measures to reduce ammonia. About a third of the drop is the result of the livestock limitation; the rest results from low-emission manure application. Continued effort would help to achieve the NEC target of 74 kilotonnes (kt)/year in 2010 (the rate was 81 kt in 2001).[3] The NH_3 reductions that were realised by industry have been cancelled out (in absolute terms) by the rise in NH_3 emissions from traffic and transport. However, emissions from the industrial and transport sectors remain much smaller than those from agriculture.

Air management objectives for *hazardous substances* are mostly being met (e.g. targets have been met for 20 of 22 substances regulated by the North Sea Conference). PAH emissions were reduced by 59% between 1985 and 2000. The North Sea Conference objective of reducing dioxin emissions by 70% (which corresponds to 130 g TEQ/year in Flanders) was met in 2000. In 1999, Belgium experienced a *dioxin crisis* that severely affected its agricultural and food industries.

The Federal Planning Bureau estimates that the total effect on GDP was 0.21% in 1999 and 0.04% in 2000 (Box 6.2). The emission limit value for dioxin and a strict inspection policy are in place.

Unfavourable trends

PM_{10} concentrations showed a decreasing trend until 1999 due largely to application of EURO 3 and EURO 4 norms. However, levels have been almost stable since then, and meeting the stricter target for 2010 does not appear feasible under current measures. In Flanders, particle filters have been installed on buses and will be installed on lorries, and during the first ten months of 2005, 7.5% of newly registered diesel vehicles were so equipped. As the federal sustainable development plan recognises, a certification system for vehicle conversion could be effective. This measure should be part of comprehensive actions including measures for precursor substances (e.g. NO_x, HC), promotion of less polluting vehicles, modal shift and other measures. More attention should be paid to $PM_{2.5}$ taking into account its health effects.

Despite good progress in reducing *NO_x emissions*, the NEC target will not likely be met. NO_x emissions from energy consumption in the manufacturing industrial sector and the residential sector increased by 5% and 7% respectively between 1990 and 2003, as a result of the more widespread use of natural gas for heating. The NEC target for NO_x seems difficult to achieve.

CO_2 emissions from energy use increased by 7% between 1990 and 2004, although they decreased by 4% between 1998 and 2004. CO_2 emission intensity is higher than the OECD-Europe average and ranks 17th in the OECD; although roughly twice that of France or Sweden, it is comparable to that of Germany and the Netherlands (Figure 2.2). Meeting the Kyoto target (as part of the EU's burden-sharing agreement) of reducing GHG emissions by 7.5% will clearly require additional measures. The Walloon Region performed well by reducing its emissions by 6.8% between 1990 and 2002 due mainly to the closure of iron and steel plants. In contrast, CO_2 emissions increased in the Flemish and Brussels-Capital Regions by 13.3% and 8.3% respectively in the period 1990-2003. The increase in Flanders was due mainly to increased energy consumption, while that in the Brussels-Capital Region was due mainly to increased residential heating.

Trichlorobenzene emissions rose by 62% between 1985 and 2000 due to pre-shipping transfer operations, but were reduced to 4% in 2004 due to a decrease and partial stop of the polluting activities. *Trichloroethylene* emissions were not sufficiently reduced to reach the 50% reduction target, but the target is expected to be reached before 2010. The only remaining emitter is a storage facility which decreased

emissions from 300 kg in 1998 to 40 kg in 2004. *PAH* and *NMVOC* emissions from industry and road traffic decreased. But in 2002, nearly 70% of PAH emissions in Flanders originated from home heating (particularly from coal and wood heating).

Tackling air pollution from the *transport sector*, including from transit traffic, is becoming increasingly important. Despite new technologies to reduce vehicle emissions, the increase in the number of vehicles on the road offsets these improvements. The NEC target for NO_x for transport is not likely to be met in 2010.

Policy measures

Belgium's environmental legislation is regularly modified to keep up with technological developments (BAT). The national air pollution law (1964) has been supplemented by decrees in all three regions and amended to *incorporate European directives*. This process has, in combination with Belgium's energy policy, produced a shift to the use of gas instead of liquid fuel in industry and the use of cleaner technologies (e.g. combined heat and power). The lowering of the sulphur content of heavy fuel oil, the adoption of certain primary reduction measures, and the adoption of end-of-pipe techniques have brought reduced emissions. In the framework of the *European Directive on Integrated Pollution Prevention and Control (IPPC)*,[4] environmental permits are being evaluated to ensure that BAT is implemented as of 30 October 2007. At the federal level, product standards for combustion installations up to 400 kW have been adopted. In Flanders, emission regulations for combustion plants (300 kW and larger), refineries, stationary engines, turbines, waste incinerators and ceramic production have been strengthened. Wallonia set up an IPPC unit in 2004 to check BAT implementation in companies in order to reduce or even avoid air emissions.

A number of *fiscal measures* to reduce energy consumption have been or are being implemented, but these are not widely used to target air emissions except in transport. *Voluntary approaches* with industry as well as co-operation agreements between regional governments, cities and municipalities are used. Flanders, for example, uses two types of voluntary approaches, benchmarking covenants and audit covenants. Analysis of the *cost-effectiveness* of air policy is widely conducted in Flanders. In the framework of the NEC directive, several studies have been commissioned to map the costs of further reducing emissions in different industrial sectors. The results estimate that reducing emissions of NO_x, SO_x and VOCs to the NEC level by 2010 would cost at least EUR 92 million (EUR 50 million for investment and EUR 42 million for operations for Flanders).

Public and private expenditure on *air pollution control* amounted to around 0.10% of GDP during the review period (Table 4.14). Most comes from the business

sector (EUR 245 million). Of the total expenditure on air protection, the share of investment was 54% in 2002 and is decreasing.

2.3 Integration of air pollution concerns into sectoral policies

Transportation trends

Belgium's road density and traffic per capita and per unit of GDP are among *the highest in the OECD. Road traffic volume* increased by 32% between 1990 and 2003 (to 92 billion vehicle-kilometres in 2003) (Table 2.6). Despite a dramatic increase in air transport, road transportation remains the dominant mode for both passenger traffic (78% of the total in 2003) and freight traffic (76% of the total in 2003) (Figure 2.3, Table 2.7). Although the rail network is dense (112 m/km^2) in Belgium, rail transport accounted for only 7 billion tonne-kilometres, or 11% of total freight traffic, in 2003 (Table 2.7). The efficiency of Belgian railways dropped by 10% between 1995 and 2000 relative to the most efficient railways in 11 European countries.

The transportation sector accounted for 24% of Belgium's total final *energy consumption* in 2003, with road traffic representing 83% of the sector (Figure 2.3). Total vehicle fuel consumption increased by 8% between 1998 and 2003. Use of diesel fuel rose from 60% to 70% of total vehicle fuel consumption. Use of liquefied petroleum gas (LPG) as a vehicle fuel decreased by 10% between 1998 and 2003 to a 1.6% share of total vehicle fuel.

Despite the rise in the volume of road traffic, overall *emissions from the transportation sector* have dropped. In the last decade, SO_x, NO_x, CO and NMVOC emissions from mobile sources have fallen by 73%, 26%, 36% and 50% respectively. However, the transportation sector remains one of the country's largest sources of air pollution: in 2003, it accounted for 52% of nation-wide emissions of NO_x, 33% of CO, 53% of particulates[5] and 26% of NMVOCs. Considerable progress will be needed to meet the EU NEC target for SO_2 and NO_x for the transport sector; targets for VOC emissions have already been met. SO_2 emissions from ocean and inland navigation are increasing, and measures to reduce them should be taken. Thus, rapid growth of road transport and resulting air pollution, noise and congestion remain *among the country's most serious environmental problems*.

Institutional integration of environmental concerns in transport policies and projects

A federal transportation policy was drafted but has since been suspended. However, the Federal Plan for Sustainable Development includes four actions (out of

31 total actions) that address transportation. These include: i) steering the demand for mobility; ii) promoting alternative ways of travelling; iii) improving the supply of public transportation; and iv) improving expertise and information on transportation.

Table 2.6 **Road vehicles: stock and traffic volume**

	Road vehicle stock ('000)			Road traffic volume (billion vehicle-km)		
	1990	2004	Change (%)	1990	2003	Change (%)
Passenger vehicles	3 864	4 874	*26*	60	78	*31*
Goods vehicles[a]	380	626	*64*	9	13	*41*
Buses and coaches	16	15	*–2*	1	1	*20*
Total	4 260	5 515	*29*	70	92	*32*

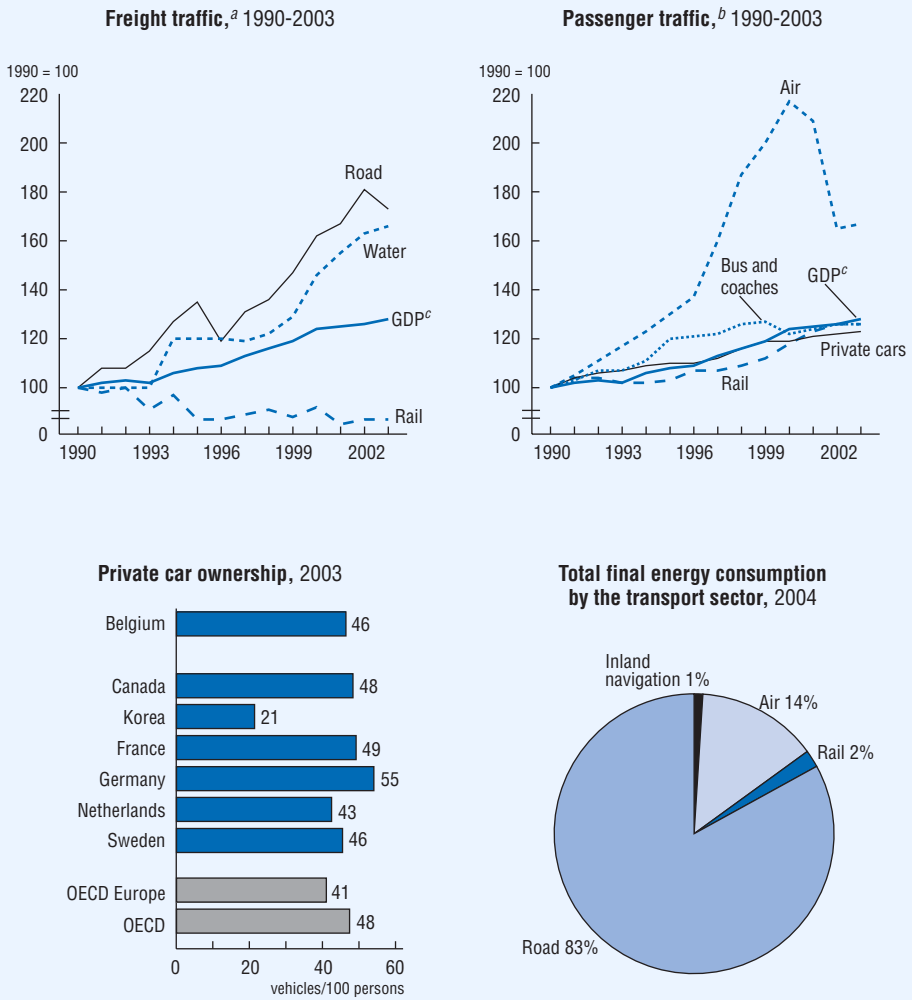
a) Including trailers and light goods vehicles.
Source: Service Public Fédéral, Mobilité et Transports.

Table 2.7 **Transport by mode**

	Passenger transport			Freight transport		
	1990	2003	Change (%)	1990	2003	Change (%)
	(billion passenger-km)			(billion tonne-km)		
Rail[a]	8	9	*24*	8	7	*–13*
Road	89	110	*23*	26	50[b]	*92*
Buses	11	15	*33*	–	–	–
Air	3	7[b]	*133*	0	0	–
Inland waterways		–	–	5	8	*60*
Total	111	141	*27*	39	66	*69*

a) Including tramways and underground.
b) Estimated.
Source: Service Public Fédéral, Mobilité et Transports.

Figure 2.3 **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) GDP expressed in 2000 prices and purchasing power parities.
Source: OECD Environment Directorate; OECD-IEA (2006), Energy Balances of OECD Countries 2003-2004.

These actions are associated with quantitative targets. The plan recognises that environmental impacts should be assessed prior to project implementation, in consultation with the authorities responsible for transportation and spatial planning. Each region has a transportation plan, but these plans are not well co-ordinated (Box 2.2): a national policy is needed to enhance their efficiency and consistency. However, a number of national measures pertaining to the national objectives of the "Ozone Plan" have been adopted and implemented.

Box 2.2 **Regional transport plans in Belgium**

The key target of the *Brussels-Capital Region*'s sustainable transportation strategy, the Regional Mobility Plan 1998, is to reduce traffic by 20% in vehicle/kilometres by 2010 (compared to 1999). The plan is currently being reviewed to promote alternative transport modes (e.g. public transport, bicycles). In addition, the Brussels Air and Climate Plan 2002-10 contains 22 actions to reduce atmospheric emissions from the transport sector. Its implementation is co-ordinated by the administrations for environment (IBGE-BIM), transport (AED) and land-use planning (AATL), and by the public transportation company (STIB). The main policy measures cover promotion of clean vehicles, reduction of available parking, creation of cycling paths, enhancing of public awareness (e.g. events, posters) and the obligation for each enterprise (of more than 200 persons) to establish a mobility plan.

In the *Walloon Region*, the Walloon Region Action Plan for Climate Change was approved in 2001. Concerning transport, it includes structural, organisational and management measures as well as educational, public awareness and training measures. Wallonia aims at a more equitable distribution of public space, encouraging "soft" modes of transportation such as bicycling and walking. During the last year, 52 municipalities established mobility plans to improve the rational use of the different transportation modes. For the transport of goods, the conditions and connections needed for the co-ordinated development of networks and freight terminals are not yet in place. In recent years, improvement of the navigability of the main waterways, combined with the regional government's recent decision to abolish navigation dues, has led to an appreciable increase in goods transported by boat.

In the *Flemish Region*, the transport policy plan includes environmental targets (e.g. air quality targets of MINA 3). The plan aims at reducing driving and improving the use of public transportation, and at promoting inland water shipping and rail for the transport of goods. Specifically, it aims to reduce car-kilometres by 17%, increase public transportation by 16%, and thus reduce tonne-kilometres by 7% by 2010 (compared to 1998). The measures simultaneously support different objectives, including accessibility, safety, amenity and less pressure on the environment.

In *Flanders*, the development of the transport policy plan included a *strategic environmental assessment* (SEA) that analysed problems related to air pollution and transport infrastructure. A summary of this assessment is part of the plan and the full assessment is publicly available. A framework for local transportation infrastructure has been established to enable municipalities to carry out analyses and develop local policies to reduce air pollution. In *Wallonia*, the Permanent Conference for Land-use Development (a regional scientific body) conducts studies to quantify the impact of *land-use management* policy on transport. In the Brussels-Capital Region, the transport and environment ministers have integrated their actions through the Bruxell'Air programme which targets the parking policy, the transportation of employees, the public transport supply and the clean vehicles policy.

In 2001, the federal government set an objective of *increasing the market share of rail* by 15% by 2010, a 50% increase in current passenger and freight traffic. Achieving that objective will require a significant effort, as NMBS/SNCB, the state-owned railway company, is characterised by high operating costs, over-staffing and low efficiency, with losses in three services (freight transport, international passenger transport and domestic passenger transport). Considering the large government subsidies that NMBS/SNCB receives (OECD, 2005a),[6] the company should make a special effort to achieve cost-effective management by investing in new infrastructure and rolling stock, and improving operational and maintenance costs. In parallel, special efforts should be made to internalise externalities from road transport.

Various measures to promote *modal shift* have been taken. As a priority project of the Railway Investments Plan 2001-12, a regional express railway (RER) is being created around Brussels (EUR 600.9 million between 2004 and 2007). The Brussels Public Transport Company (STIB) is also implementing a strategy to promote the use of bicycles by allowing them to embark in the metro, and to install a multi-modal platform near the Brussels harbour. The Walloon Region has a project for the independent port of Clabecq and creation of a third hub for three modes of transportation that will allow the development of integrated transport from the Charleroi-Brussels Canal. In Flanders, a project at the Port of Zeebrugge under the EU PACT Programme scheme (1997-2001) to set up sea-river service between Belgium and Germany has been highly successful (European Commission, 2001).

The very large volume of cargo handled by the *port of Antwerp* is growing steadily: more than 150 million tonnes were handled in 2004, of which 70 million tonnes were container cargo (Antwerp Port Authority, 2005). Containers are carried to and from the *hinterland* by truck, rail and barge, which transport 64%, 6.5% and 29% respectively. The Antwerp Intermodal Network project aims to reduce the proportion of road transport to 40% – equivalent to shifting 865 million-tonne-km of freight from roads to trains and barges – under the EU Marco Polo programme (2003-06).[7]

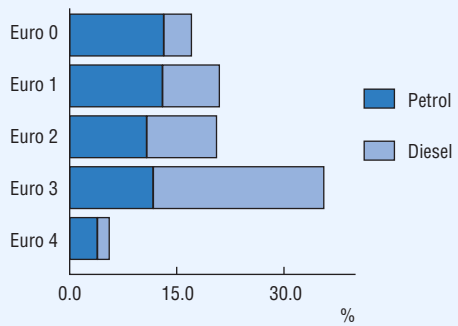
Completion of the LGV Belge (high-speed line) in 1998 brought Brussels and Paris to within 85 minutes of each other by *high-speed train*. The success of the line caused air companies to withdraw from this route. In 2003, the Leuven-Liege section opened. A line which runs from Brussels via Liege to the German border (Aachen, Cologne), and another line serving Antwerp, Rotterdam and Amsterdam, are scheduled to open in 2007. The line Brussels-Luxemburg will also be modernised for a budget of EUR 458 million.

With an estimated budget of EUR 403 million, the *Diabolo Project* will provide a new railway network with a direct connection from the north and east of the country to Brussels-National Airport. In 1999, 87 000 people traveled to or from Brussels-National Airport, and this figure could reach 116 000 in 2010. Improving public transportation has therefore become necessary. At present, only 10% of people commuting to the airport use trains. The Diabolo Project should help raise this figure to 30%.

Improving vehicles and fuels

In early 2005, 36% of cars registered in Belgium met the EURO 3 standard and 6% met the *EURO 4 standard*, while 17% did not meet even the EURO 1 standard (Figure 2.4). The average age of the car fleet is eight to nine years old. Since 1999, cars more than 25 years old have not been allowed on public roads. In 2002, the federal government embraced the idea of labeling cars less than four years old and

Figure 2.4 **Stock of passenger cars by fuel type and by emission standards,**[a] 2005



a) European emission standards increasingly stringent from Euro 0 to Euro 4.
Source: Belgium Federation of Automobile and Cycle industry.

cars that met the EURO 1 standard with a "blue pastille". The label would have made it possible to stop the most polluting cars during peak pollution days, but it was never put into practice. In Flanders a label called Ecoscore has been developed based on all regulated pollutants, noise and CO_2 emissions.[8] The Flemish Region is revising the vehicle taxation (both registration and circulation tax) which will be based on this Ecoscore. To improve emissions of heavy duty vehicles, Flanders will give financial support to install particle filters on buses and heavy duty vehicles.

In Belgium, all automobiles that are four years old and older are required to pass an annual *technical inspection* at one of the 76 inspection centres. Diesel vehicles are tested for PM emissions, and gasoline vehicles are tested for exhaust gases. Approximately 485 000 vehicles fail the inspection every year. About 40% of these are stripped, recycled or crushed; the rest are resold abroad. Some 590 000 new cars were registered in 2004.

While *fuel quality standards* are based on EU regulations (e.g. 350 ppm sulphur content for diesel and 150 ppm for petrol), most diesel and petrol fuels sold in Belgium contain only 50 ppm sulphur. The excise duties are reduced for these fuels. Due to Belgium's revenue-neutral taxation policy, reduction of the excise duties on 50 ppm sulphur fuel was balanced by a higher tax on the 350 ppm and 150 ppm fuels. Further SO_x reductions are expected for 2009, as all fuels marketed from 1 January 2006 should contain no more than 10 ppm of sulphur. The difference between gasoline and diesel prices[9] has led to a gradual *shift toward diesel cars,* which have made up more than half of the total number of vehicles since 2004.[10]

Measures are needed to reduce the emissions from both *ocean and inland navigation*. The port of Antwerp being one of the largest harbours in the world generates important ship traffic and related emissions. The Flemish PM reduction plan foresees the development and implementation of measures dealing with ocean and inland navigation.

Traffic management

Brussels-Capital has planned a hierarchy of roads to avoid traffic jams in residential areas. Since 2001 the region, associated with its 19 municipalities, has participated each year in the "European Mobility Week", especially with the action "In town, without my car!" during one Sunday in September. In 2003, traffic noise was down by 10 decibels on average, while the highest recorded level of NO_x emissions was eight times lower than on a normal weekday. Public transportation is free on one September Sunday and its use increased to 70% of normal weekday use in 2003. Municipalities are responsible for *parking management* (e.g. creating parking plans, defining the parking fees). The "stand still" principle, or no expansion of parking space, as well as restrictions on the duration of

parking are in effect, yet the number of parking spaces increased by 10%, or 562 000 spaces, between 1999 and 2005. This increase nearly matches the number of new vehicles registered annually. Regarding *speed limits*, Belgium's are average compared to other European countries. In Flanders, speed is limited to 70 km/h on most roads outside city centers and to 30 km/h in residential areas.

A traffic control centre has been in place since 2000 in Antwerp to reduce *traffic congestion*. Additional traffic control centres are being planned in Ghent and Brussels. Buses have been authorised to drive in the emergency lane of the motorway between Wavre and Brussels and on the ring road of Antwerp to increase the speed of bus service. The highway law was modified in 2004 to enable the manager of the road system to reserve a traffic lane not only for public transportation but also for high-occupancy cars. Dynamic traffic control, already installed in Flanders on Antwerp highways and planned on other highways, will be optimised to reduce congestion and PM and NO_2 concentrations.

Market-based integration of environmental concerns in transport practices

Various *fiscal measures* have been implemented. For example, the *registration tax* is based on engine capacity in horse power (HP), power in kW and vehicle age. The registration tax also provided a reduction for EURO 4 vehicles, which was introduced during 2002-04, and LPG (Table 4.2). The annual *road tax* is also based on engine capacity in HP. An annual supplementary road tax has been introduced for LPG vehicles. A *solidarity contribution fee* has been in effect based on CO_2 emissions. An *excise compensation tax* for diesel vehicles, based on engine capacity in HP, was introduced to compensate to some extent for the lower excise duties on diesel fuel, but is scheduled to be phased out. A ratchet system for excise duties on motor fuel (both diesel and petrol) was introduced in 2003: up to a certain limit, half of the yearly price drop could be offset by an increase in excise duties until 2007. However, due to the rise in oil prices, a reverse ratchet system was put into place in July 2005, replacing the existing system. Since 2002, vehicle taxation has been the responsibility of the regions, though the federal government collects the taxes.

The "bonus" for *energy-efficient vehicles* gives car buyers a *reduction in income taxes* when they purchase an energy-efficient car; the estimated budgetary cost of this programme amounted to EUR 11.6 million in 2005. The purchase of hybrid cars is favoured because the measure is based on CO_2 emissions. Acquisition of less-polluting cars has also been encouraged by federal ministries which agreed to purchase environmentally-friendly cars for at least 50% of their car fleet when renewing the fleet. In Brussels, the regional administrations' car fleets must include at least 20% "clean cars" such as LPG, natural gas, electric or hybrid cars. As of January 2006, the tax exemption for sport utility vehicles (SUVs) has been removed.

Commuting by public transportation is encouraged. Federal and Flemish civil servants commute by train free of charge, and a federal incentive encourages private enterprises to give the same advantage to their employees. Employers may deduct up to 120% of the expenses incurred for the operation of collective transportation of employees. Deduction of travel expenses between home and work by all modes of transportation (including cycling and walking) will be extended from the current to 50 km round-trip to a 200 km round-trip starting in the tax year 2007 (Box 4.3).

Belgium participates in the *Eurovignette* scheme based on the 1999 EU directive on charging heavy goods vehicles for infrastructure use. The scheme imposes a maximum *road user charge* for various vehicle categories, differentiated by environmental performance (Table 4.2). The introduction of another road vignette for car traffic is being approved, but does not contain any environmental criteria.

A study on transport externalities has been conducted for Flanders, with the aim of *internalising external costs*. The study concludes that current taxes are lower than the marginal damage costs for the various types of vehicles (Box 2.3). This leaves significant externalities to be internalised. Various instruments may be considered including raising the excise tax on fuel and introducing road pricing. Since few of Belgium's transportation taxes target environmental performance, both the regions and the federal transportation authority have considered a broader transport tax reform.

Energy policy

One of the six action themes of the Federal Plan for Sustainable Development (2004-08) is "limitation of climate change and more intensive use of clean energy". This theme has five actions: i) strengthening federal co-ordination, including implementation of a *green tax system* (e.g. for the transport and electricity sectors); ii) establishing "*fair prices*", including a reform of the tax system (e.g. shifting from taxation of labour towards taxation of resource consumption); iii) building solidarity through "*flexibility mechanisms*", including proactive dialogue with developing countries, strengthening of financial and technical assistance, and capacity-building; iv) promoting *alternative energy*, including support for renewable energies, rational use of energy and promotion of bio-fuels; and v) promoting "clean buildings", including removal of obstacles to investment to improve *energy efficiency* (Chapter 4).

The *voluntary approach* with the electricity company has met all the adopted targets and a further ceiling has been agreed. By 2003, SO_2 emissions were reduced by 92% compared to their 1980 level (surpassing the target of 85% reduction) and NO_x emissions by 66% (surpassing the target of 45% reduction).[11] These results are due to: i) increased use of nuclear electricity; ii) installation of cleaner technologies

Box 2.3 **Transport externalities in Flanders**

Damage caused by road vehicles

An intensive study (by Transport and Mobility Leuven), which reviewed the cost of damage caused by transportation in Flanders, concluded that impacts associated with air pollution, climate change and noise have decreased, but not those associated with congestion. Since 1991, the *costs of air pollution* have decreased by 47% due mainly to improved vehicles. While average fuel consumption has remained stable, there has been a slight drop in the damage *costs for climate change* (–6%). This is explained by the shift from petrol to diesel vehicles which emit less CO_2. The damage resulting from noise is rather small. The impacts of air pollution, climate change and noise represented 12.5% of the total estimated marginal damage costs caused by transport in 2002.

Marginal damage *accident costs* decreased by 61% between 1991 and 2002. This is because the number of accidents decreased, whereas the number of vehicle-kilometres increased. These damage costs represented 9% of the total estimated marginal external costs in 2002. Marginal damage *congestion costs* increased by 31% between 1991 and 2002. This reflects an increase in vehicle movement volumes and associated traffic jams. In 2002 they represented 79% of the total estimated marginal damage costs (61% in 1991).

The study also showed that damage costs differ significantly *according to the type of vehicle that generates them*. A lorry or bus causes more damage than a car. In 2002, the marginal damage costs of buses and freight vehicles amounted to EUR 54.9 and EUR 52.5 respectively per 100 vehicle kilometres, whereas those of personal vehicles are EUR 24.4 (petrol), EUR 25.9 (diesel) and EUR 22.7 (LPG). However, since more people ride on a bus than in a vehicle, the damage costs per person-kilometre in a bus is lower than for car travellers. Light freight vehicles cause damage of EUR 36.2.

Costs (including taxes) incurred by road vehicles

There is a notable difference between diesel and petrol *personal vehicles*. Per 100 kilometres, diesel vehicles incur a cost of EUR 18.3, of which EUR 6.9 are taxes (38%), while petrol vehicles incur a cost of EUR 28.4, of which EUR 11.6 are taxes (41%). The cost is lower for diesel vehicles because the tax on fuel is lower and diesel vehicles drive more kilometres per year. LPG vehicles incur approximately the same cost as diesel vehicles (EUR 18.5). The tax on LPG is very low (26%), but the maintenance costs are higher.

Light diesel freight vehicles, which incur a cost of EUR 14.5 per 100 kilometres, are also less costly per kilometre than personal vehicles. *Heavy freight vehicles and buses* are still more costly to use: heavy freight vehicles cost EUR 45.3 per 100 kilometres, of which EUR 13.5 are taxes (30%); buses cost EUR 54.8 per 100 kilometres, of which EUR 15.1 are taxes (28%). These high values per kilometre are caused by the high maintenance fees and fuel consumption. The eurovignette and the tax on insurance premiums also play a role. Since the VAT can partly be recuperated, the tax percentage is lower than for person vehicles.

Conclusions

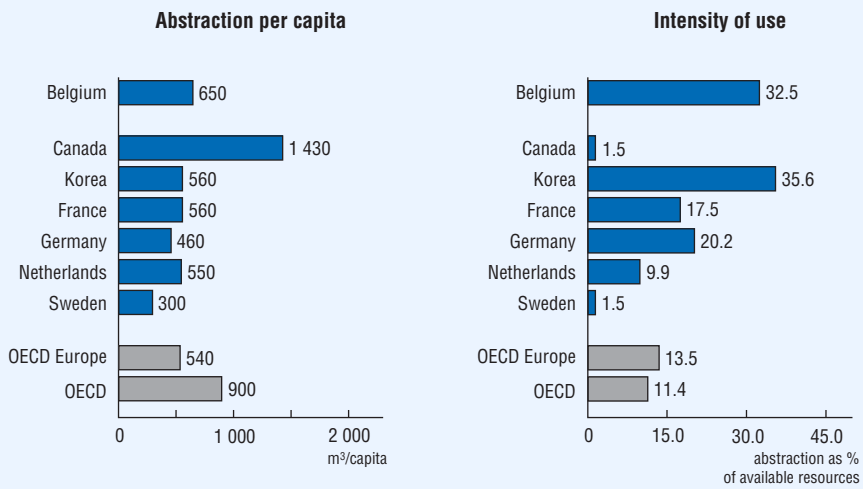
The study concludes that the *tax is lower* than marginal damage costs for all categories of vehicles. All road vehicles thus cause non-internalised damages.

(e.g. low NO_x burners, "Over Fire Air") and end-of-pipe techniques (e.g. flue gas desulphurisation); iii) closure of older and less environmentally sound units; and iv) a switch to cleaner fuels. Voluntary approaches have also been widely used in the Walloon Region, where 117 energy-intensive firms represent more than 90% of industrial energy consumption, and in Flanders, with benchmarking covenants for the 80 most energy-intensive companies and audit covenants for medium-sized energy-intensive companies (Chapter 4).

3. Water Pollution and Flooding

The *intensity of freshwater abstraction* in Belgium, at about 45% of total renewable resources, is *the highest in the OECD area* (Figure 2.5). Although total abstraction from surface and groundwater fell by 18% between 1995 and 2002, per capita abstraction, at 650 m^3/head/year,[12] remained above the 540 m^3/head/year average for OECD-Europe. However, Belgium's per-capita consumption of piped water (i.e. not counting direct abstraction for cooling, agriculture and industrial processes), at 48.2 m^3/head/year, remains well below the European average of about 110 m^3/head/year.

Figure 2.5 **Freshwater use,** early 2000s[a]



a) Or latest available year.
Source: OECD Environment Directorate.

3.1 Water quality trends

Surface waters

The quality of Belgian surface waters showed *some improvement* during the review period, *but it remains poor overall* in the densely settled areas of the country. Belgium has a very long distance to go to achieve the "very good" or "good" standards required by 2015 under the WFD. It is also becoming increasingly clear that improving biological water quality will require not only a reduction of the pollution burden but also other types of measures such as the "re-naturalising" of water courses. All three regions are undertaking this kind of work.

In Flanders, after the rapid improvements observed during the previous review period, the downward trend in the regional average *concentration of oxygen-related pollutants and nutrients* (i.e. biochemical oxygen demand (BOD), chemical oxygen demand (COD), ammonia-N and nitrate-N, and phosphates) slowed during 1997-2003. The physico-chemical quality of surface waters remains poor, with only 2% of measuring stations meeting basic quality standards for all 24 parameters. In 2003, 63% of Belgium's monitoring sites did not meet the standard for BOD, 26% for nitrite/nitrate nitrogen, 61% for ammonia-N, and 75% for total phosphorus. The share of 1 023 measuring stations with "good" to "very good" *biological water quality*, as measured in terms of the Belgian Biotic Index, rose from 17% to 29% during 1997-2003, whereas the share with "extremely bad", "very bad" and "bad" biological quality fell from 45% to 27%. By a different classification (fish index) for the period 2001-05, however, Flanders has no water bodies with a "very good" quality, and at least 20% have no fish at all. In 5.6% of the water bodies, the quality is good (Meuse and Nete basin). The presence of *hazardous chemicals* in surface water and sediments is confirmed by the most recent (2003) results of a long-term bio-monitoring network, which showed, among other things, that the allowable concentration of PCBs in the flesh of eels was exceeded at 80% of 350 locations. Levels of various contaminants varied strongly depending on location; the concentration of lindane, for example, was exceptionally high in the north-western part of Flanders (ten times the level measured across the Dutch border). The brominated flame retardants accumulated in the eel from the upper Scheldt region is the highest worldwide. From May 2002 to December 2005, fishermen in Flanders were obliged to return eels caught in Flanders and all fish caught on the five most polluted waters in Flanders.

In *Wallonia*, there is a striking difference in biological water quality between the Meuse and Rhine basins (e.g. Ourthe, Moselle, Amblève) and the Scheldt basin (e.g. Haine, Escaut-Lys, Senne), with its high population density, industry and intensive agriculture. Improvement in water quality is also more prevalent than deterioration. *BOD* quality across the region improved at 60 out of 148 measuring stations

between 1996 and 2004, while it deteriorated at 12 stations (Ministère de la Région Wallonne, 2005a). For *nitrogen compounds* other than nitrates, water quality improved at 32 out of 139 stations and deteriorated at 3 over the same period. For *phosphorus compounds*, the proportion of stations with "poor" and "very poor" quality fell from 30% to 20%. *Nitrate-nitrogen* and inorganic phosphorus levels, on the other hand, did not diminish during the review period as several waste water treatment plants have yet to be upgraded for nutrient removal. Among the *pesticides* found in Walloon surface waters, diuron (a herbicide primarily used in Belgium outside agriculture along roads and railway tracks) and atrazine (used on maize) are of most concern.

Bottom sediments

The *contamination of bottom sediments with heavy metals, PCBs and pesticides, with consequences for water fauna*, is a serious issue in Flanders. The concentration of heavy metals in the flesh of eels is monitored at 300 sites throughout the region; at one site in the Beverlo Canal, consumption limits are exceeded for cadmium and lead. Taking account of physico-chemical, biological and ecotoxicological factors at almost 1 200 sites, sediments in 37% of the region's water courses have been classified as "strongly contaminated" and a further 37% as "contaminated"; sediments at just 3% of sites are considered "uncontaminated". The goal of the MINA plan 3 to remove 500 000 m^3 of sediment by 2007 from the non-navigable waterways had already been met by the end of 2005. More than 1.3 million tonnes (dry weight) of sediment enter Flemish water courses every year, of which 1.2 million tonnes enter the navigable waterways and 0.1 million tonnes the non-navigable. This has caused the current dredging backlog of 23.6 million tonnes, of which 18 million tonnes should be regarded as contaminated. Priorities for removal are set with the help of a sophisticated assessment methodology (TRIADE) taking account of physico-chemical, ecotoxicological and biological criteria. Given the high cost of removing and treating (or finding safe storage for) contaminated sediments, leaving low-risk sediments alone, should remain an option.

Groundwater

All three Belgian regions have upgraded their groundwater monitoring effort in response to the requirements of the WFD. Groundwater monitoring networks now include almost 3 000 wells across the country. The monitoring shows *elevated nitrate levels* in many aquifers. In Flanders, in the spring of 2005, the nitrate limit value of 50 mg/litre was exceeded in 39.5% of more than 2 000 wells and the guide value of 25 mg/litre in 51% (Vlaamse Landmaatschappij, 2005). These wells were originally installed for the purpose of nitrate research. In Wallonia, measurements are taken at the drinking water supply installations. The situation is somewhat more favourable in

Wallonia, where 10% of drinking water intakes recorded nitrate levels above 50 mg/litre; nevertheless, the trend is negative with nitrate levels increasing at 102 out of 699 drinking water intakes between 1996-99 and 2000-03 and falling in only 34 bores. The nitrate situation is most serious in the so-called Brusselian Sands aquifer, where the proportion of intakes with levels exceeding the 50 mg/litre standard rose from 16% to 37%.

As for the contamination of groundwater by *pesticides*, atrazine and its breakdown product de-ethylatrazine are the most widely found substances in Wallonia: between the periods 1996-99 and 2000-03, groundwater tested for atrazine remained in the same class at 310 out of 417 sites, improved by one class at 80 sites, and dropped to a lower class at 27 bores (Cellule État de l'Environnement Wallon, 2005). More recently, a slight reduction in atrazine concentrations has been observed, presumably as a result of the ban on the use of this compound in herbicides during the 1990s. Wallonia is actively pursuing a programme to protect drinking water source areas: by mid-2005, 59 protection zones (out of a planned 405) had been designated. Given that climatic factors and lag effects affect trends in pesticide concentrations, it is too early to draw conclusions about the effectiveness of these management efforts. Also in Flanders, protection zones for groundwater have been designated.

Coastal water quality

The ecological *state of Belgian coastal waters* can be characterised as disturbed. The concentrations of nutrients, in the water column are problematic and eutrophication remains an important issue (Van Sevencoten, 2004). In marine sediments and biota, concentrations of heavy metals and organochloropesticides show few clear trends since the early 1990s. However, it is clear that lindane concentrations have decreased in sediments as well as biota compared to the 1970s; concentrations of PCBs have decreased in sediments and biota but in the last decades the changes have been too small to be detected. Analysis of heavy metal concentrations in the flesh of blue mussels over the past 15 years has shown relatively low contamination with neither positive nor negative trends. The fact that in October 2005 mussels grown in the Belgian marine waters were harvested for the first time in many years is a sign of hope.

The North Sea/OSPAR recommendation to halve *inputs of nutrients* into marine waters by 2005 (base year 1985) was achieved for phosphorus during the review period with a reduction of 53% by 2003; for nitrogen, however, the reduction of total nitrogen (37%) did not meet the 50% target, as was the case for other North Sea states. The more specific objective of reducing nutrient discharges from sewage treatment plants by 70% has not yet been achieved.

Bathing waters

Belgium is on a par with other EU countries in terms of meeting the mandatory bathing water standards for coastal sites set by the EU Directive on Bathing Water Quality. But the country does less well in meeting the mandatory standards for freshwater and the stricter guide values at all sites. In 2004, Belgium designated 39 coastal and 72 freshwater bathing sites under the EU bathing water directive, of which 25% and 40%, respectively, complied with the guide values, and 97% and 73% with the mandatory standards. Almost 21 km of the country's total coastline (66 km) are bathing waters; in most years, all 21 km meet the directive's mandatory standards, and between 13% and 29% also meet the more stringent guide values. In 2004, just over 8% of bathing sites were temporarily closed.

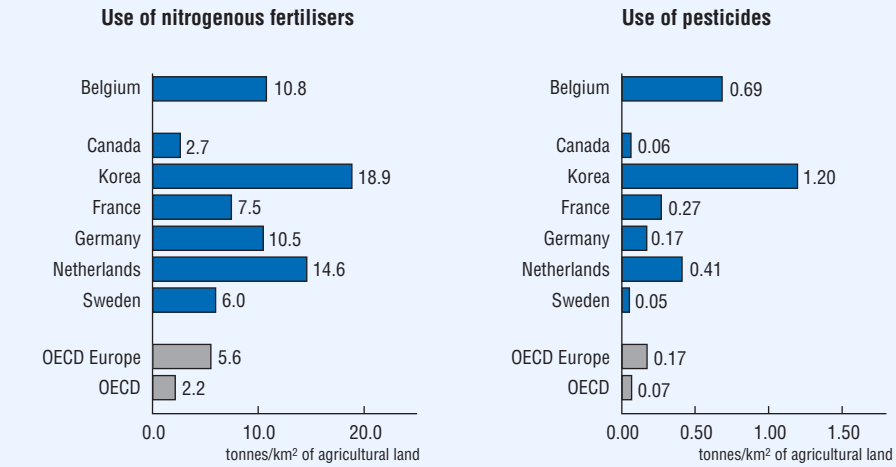
3.2 Pollution from agriculture

Environmental pressures from agriculture remain *among the country's most serious environmental problems*. The pressure from Belgian agriculture on the environment is among the highest in the OECD area (Figures 2.6 and 2.7). Even though the share of agriculture in the Belgian economy (about 1% of GDP, less than 2% of employment) is below the EU average (Federal Government, 2000), the intensity of nitrogenous commercial fertiliser use (10.8 tonnes/km^2 of agricultural land), and the density of livestock (1 800 head of sheep equivalent/km^2 of agricultural land) rank among the highest of OECD countries (i.e. 28th and 29th respectively). In Flanders, the density of livestock (2 564 head of sheep equivalent/km^2 of utilised agricultural area) is particularly high. Flanders and Wallonia have both transposed the EU Nitrates Directive (Flanders in 1991, Wallonia in 1994 and 2002), but the European Court of Justice in September 2005 found that the two regions had fallen short of adequately implementing certain provisions, such as designating vulnerable zones and setting rules for fertiliser application. At the end of 2005 and 2006, Flanders consulted with the European Commission to comply with the court judgement and the provisions of the Nitrates Directive. Therefore a new nitrate action plan and new manure decree for Flanders are prepared to be in force as of the beginning of 2007.

Manure management

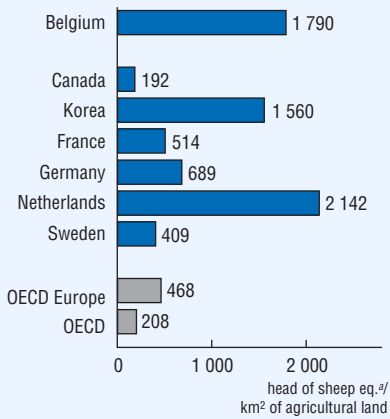
Both regions have put in place *manure management systems*. Flanders did so in 1991 through two Manure Action Plans, which include manure levies (Chapter 4) and the Manure Bank. Wallonia adopted (and incorporated in the Water Code) the Programme for the Sustainable Management of Nitrogen in Agriculture (PGDA) in 2002. The measures taken in both regions not only set rules for the handling of

Figure 2.6 **Agricultural inputs,** early 2000s



Source: FAO (2004), FAOSTAT data; OECD Environment Directorate.

Figure 2.7 **Livestock density,** 2005



a) Based on equivalent coefficients in terms of manure: 1 horse = 4.8 sheep; 1 pig = 1 sheep; 1 goat = 1 sheep; 1 hen = 0.1 sheep; 1 cow = 6 sheep.
Source: FAO (2006), FAOSTAT data.

manure but also foster farmer know-how and good agricultural practice (e.g. through codes of practice for different types of farming), and promote the use of low-nutrient feed. The measures also set ceilings on nutrient production (by way of a maximum production level), and include a registration system for livestock and land (Table 2.8). Implementation of the measures has produced significant, though as yet *insufficient, progress*.

In Flanders for instance, modelling shows that agricultural *discharges to surface water* of nitrogen and phosphorus were reduced by 16% and 14%, respectively, between 1997 and 2003. Results from the Manure Action Plan surface waters monitoring network show that the *nitrate concentration* exceeded the standard of 50 mg NO_3/l at 60% of the region's measuring points (260) during the 1999-2000 hydrological year, and at 41% of the extended monitoring network (800 measuring points) during the 2004/05 year. The surplus of the *nitrogen soil balance* was reduced from 220 to 152 kg N/ha during 1997-2003 (the 2007 target is 70 kg N/ha); the surplus of the phosphorus soil balance dropped from 43.2 to 20.2 kg P/ha (the 2010 target is 3.6 kg P/ha).

The *measures* taken in Flanders that have contributed most to the progress made so far have been the reduction in stock numbers, the use of low-phosphorus feeds and the transportation of the manure from dense livestock regions to regions with a low density (about 100 000 movements annually); on the other hand, low-nitrogen feeds, manure processing (85 companies are active in this field), the export of manure, and better fertilising practices yielded results that were below expectations (Table 2.4). However, the distance-to-target for nitrogen (in terms of the nutrientbalance in the

Table 2.8 **Manure management in Flanders,** 2004

(million tonnes)

	Phosphorus	Nitrogen
Production	61.5	161.5
Losses in stables and storage	–	24.5
Deposition on land	49	110.0
Processing and export	8	9
Surplus	4.5	1.8

Source: Vlaamse Landmaatschappij.

soil) equals about 80% of the current use of mineral fertiliser (or 30% of that of animal manure), so that the *challenge for the future remains daunting*. The target may not be achievable under current policies. In a recent (November 2005) progress report by the Flemish Land Agency (VLM), the steering group on Flemish manure problems recommended a thorough and fundamental review of the Manure Action Plan.

In Wallonia, the number of livestock farms that produced more *animal manure* than could legally be spread on the farm fell from 18% to 11% in the year following the adoption of the PGDA. Although the number of cattle fell by 11% between 1990 and 2004, the manure nitrogen load from this source still represents 90% of the total organic nitrogen load; also, the increase in pig (17%) and poultry (380%) numbers partly offset the gains made in the cattle sector. The use of mineral nitrogenous fertilisers was reduced by about 20% during 1990-2003 and that of phosphorus by about 53%. Whether these early results may just represent the "low-hanging fruit" harvested by new policies remains to be seen; given the experience of the Netherlands, for example, the continuing effectiveness of the PGDA should be kept under close review.

Pesticides

Pesticide use per unit of agricultural area also is *among the highest in OECD-Europe* (Figure 2.6).[13] It reflects to a large extent the high proportion of land used for growing vegetables and fruit crops. No consistent long-term trend is discernable in the overall use of pesticides (i.e. insecticides, fungicides, herbicides and other) since 1990 (OECD, 2005b), but efforts at both federal and regional levels have focussed on reducing the risks related to pesticide use. Granting market licenses for pesticides is a federal power exercised in the framework of the European directive on agricultural pesticides (91/414/EC). In March 2005, the federal government published its first pesticide risk reduction programme, whose main objective is to reduce the risk from agricultural pesticides by 25% by 2010 (compared to use in 2001). In Flanders, the risk to aquatic life (expressed as dispersion equivalents Seq) was calculated as having been reduced by as much as 52% (thereby reaching the 2005 MINA 3 target of 50%) between 1990 and 2005, due to the banning of products such as lindane and parathion. In Wallonia, pesticide sales fell by 30% (cereals) and 23% (sugar beet and maize) during the 1990s.

These positive results should be bolstered by giving greater emphasis to *integrated pest control (IPC) and organic farming*. In Flanders, IPC represented only about 10 000 ha in 2003 and organic farming 3 153 ha in 2005. In Wallonia, 2.7% of the agricultural area was under organic farming in 2004, well below the 4% target (in the "Contract for the Future of Wallonia" and in the Federal Plan for Sustainable Development 2000-04). The EU objective for organic agriculture is 10% of agricultural production by 2010; some countries (e.g. Austria, Italy) are much closer to the target.

3.3 Waste water treatment

Meeting the challenge

Given its backlog in waste water infrastructure in the early 1990s, *Belgium has faced a greater challenge than most* of its neighbours in meeting the requirements of the EU Urban Waste Water Treatment Directive. This is not only a matter of having to traverse a greater distance-to-target. In a very densely settled country, it takes time to obtain public acceptance for the siting of new treatment stations, and the construction of new sewerage networks causes large traffic problems and additional road construction costs. In addition, since 2001, the entire Belgian territory has been designated under the directive as sensitive to eutrophication, making nutrient removal mandatory for all treatment stations with a capacity greater than 10 000 person-equivalent (p.e.). So far, none of the directive's deadlines have been met on time.

Furthermore, the institutional, planning and financial arrangements for investment in sewerage and waste water treatment, put in place after the federalisation process of the early 1990s, *prejudiced the cost-effectiveness of the effort* in the starting period and had to be adapted during the review period. One problem was poor co-ordination in the planning for treatment and reticulation infrastructure. For example, 30% of the available treatment capacity in Wallonia was unused in 2004 because associated sewerage networks had not yet been built or connected (Cellule État de l'Environnement Wallon, 2005). In December 2004, the Belgian Court of Audit criticised the Flemish Region for the absence of programme planning, under-performance of financing mechanisms, and poor communication between the region and municipalities. The regions are now tackling the problem: Wallonia through sub-basin area waste water treatment plans (PASHs), Flanders through the establishment (in 2004) of inter-municipal structures, and all three regions through changes to their financing arrangements.

The two large regions also responded by *making drinking water companies responsible for the clean-up of the water they deliver to customers*. Since 2004, Flemish drinking water companies have concluded agreements about the required services with Aquafin, the regional public-private company responsible for building and operating waste water treatment stations and the large collector systems that convey sewage from the municipal sewerage networks to the treatment plants. A similar system was introduced in Wallonia in 2000, where the SPGE (a public company in which the regional government has a 50.001% majority stake while the rest is in the hands of other public bodies and financial institutions), on behalf of drinking water companies, formulates waste water management plans for all sub-basins in the region, finances waste water infrastructure, and protects drinking water sources. Responsibility for building and operating waste water facilities rests with

eight public companies recognised by the SPGE. Brussels-Capital maintained its structure with three companies responsible for, respectively, the collection and purification of drinking water, the distribution of that water to customers, and the collection and treatment of sewage; however, it set up a special fund to finance construction of the large collectors that take sewage to the very large treatment station currently being built.

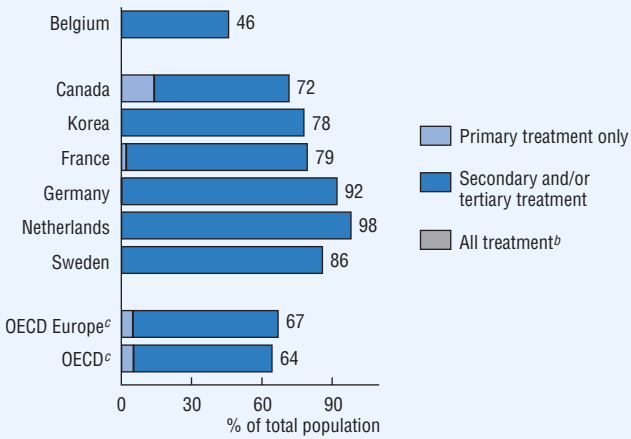
Even though all three regions are still making concerted efforts to satisfy the requirements of the European urban waste water directive as quickly as possible, the *rate of progress* over the past decade *amounted to only about 2% annually* (the share of the population connected to a public treatment station grew from 28% in the mid-1990s to 46% in 2005); progress is somewhat better if measured in terms of the volume of sewage treated. While the rate of progress is likely to increase from now on (as some large projects are nearing completion), questions remain about the construction industry's capacity to absorb an increased rate of activity. Hence, official expectations of meeting the directive's 2005 targets by 2007 (Flanders and Brussels-Capital) or 2009 (Wallonia[14]) seem too optimistic. The Flemish Region reported that they expect to realise the major part of their obligations by the end of 2007; a number of limited projects still remain problematic, e.g. ongoing law cases. In any case, further work beyond that required by the EU Urban Waste Water Treatment Directive will be needed to achieve the good ecological and chemical status that the European WFD requires for all water courses by 2015.

Sewerage and sewage treatment

In Flanders, the share of the population connected to a *sewerage network* grew from 82% to 86% between 1997 and 2003. Wallonia made progress in extending the sewerage network: i) for agglomerations under 150 000 p.e., where the rate of connection rose from 80% to 85% between 2000 and 2005, with the target being 90% coverage in 2010; and ii) in cities above 150 000 p.e., where the target of 90% has mostly been met. Brussels-Capital has almost completed connecting all households to the sewerage system.

An estimated 46% of the Belgian population is connected to a public *waste water treatment* plant (Figure 2.8). In Flanders, this figure grew from 45% to 63% (including almost 60% with nutrient removal) over the review period; the region expects to surpass 70% by the end of 2007, which is still short of the 80% goal set in the MINA Plan. In Wallonia, as of the beginning of 2005, 46.4% of the population was connected (or 53.5% of the population living in zones connected or to be connected to sewerage networks); more than half of the currently installed treatment capacity includes nutrient removal. Expressed in terms of the organic charge (DBO5) treated (including from industries discharging into the public sewer network), the proportion rose from 38% to

Figure 2.8 **Population connected to public waste water treatment plant,** early 2000s[a]



a) Or latest available year.
b) Primary, secondary and/or tertiary treatment.
c) Secretariat estimates.
Source: OECD Environment Directorate.

60% over the review period. Brussels-Capital commissioned its first waste water treatment plant (treating 25% of the region's sewage to secondary standard) in 2000; a further plant dealing with the other 75% (as well as sewage from neighbouring Flemish communities) is due to begin operating in 2007.

However, one factor detracting from the effectiveness of the new infrastructure is the *state of existing sewerage networks*. Undesirable inflows (from stormwater systems, canals, etc.) dilute the sewage entering treatment plants in some regions and compromise their efficient operation (Box 2.4), while the frequency of wet-weather sewage overflows from combined systems is considered a major bottleneck for improving the bacteriological quality of recreational waters (especially in coastal areas). The problem is extensive: an investigation covering about one-third of the Flemish territory identified 4 300 connections needing remedial action.

The *operational effectiveness* of waste water treatment stations generally is of a high standard. For example, 92% of the 185 treatment plants operated by the Flemish company Aquafin met all effluent limits in 2004 (Aquafin CRC, 2005); the treatment

Box 2.4 **Water in the city**

Many *water courses in urban areas* across Belgium have over time been enclosed for reasons of public hygiene as well as to create more space for buildings. The drawback, however, is that the resulting sewers tend to block up during heavy rainfall and cause flooding upstream. Furthermore, aquatic species cannot thrive in long stretches of covered waterway. Given the emphasis on habitat and flood prevention in modern water management, the old solutions are becoming less acceptable. Water authorities in several parts of Belgium have embarked on efforts to uncover piped water courses, separate stormwater and sewage networks, restore stream channels to their natural state, and make water a more visible part of the cityscape.

The *Blue Network*[*] in the Brussels-Capital Region, for example, was explicitly defined to pursue water quality, flood prevention and urban amenity objectives. About 400 metres of the Woluwe Stream, which had been enclosed since the mid-19th century, and its banks have in recent years been restored, creating an open, natural stream and a green corridor that is also part of the region's Green Network. The project also involved the separation of stormwater and sewage flows and therefore reduces the undesirable dilution of the influent into Brussels' waste water treatment plant. The work on the Blue Network continues.

Recreating natural habitats is not always a large part of the equation, however. Opening up the former Melaanvliet in the old city centre of Mechelen, for instance, will restore an historic urban form rather than a natural state. The work is part of an EU Interreg IIIB project called "*Water in Historic City Centres*", involving six cities in Ireland, England, the Netherlands and Belgium. Nevertheless, the project does retain some natural elements, such as water plants and trees alongside the canal. Public safety is another aspect of the Melaanvliet project, for the design includes a footpath and bicycle lane to provide safe access for children to neighbouring schools, a music conservatory and a cultural centre.

* In French: maillage bleu.

ratio for BOD, COD and suspended solids reached 99%, 89% and 95%, respectively, in 2004. The 79% emission reduction for phosphorus exceeds the 75% target (required in sensitive zones by the 1998 amendment to the EU Urban Waste Water Treatment Directive) and the nitrogen removal performance of 71% almost met the 75% target range (stipulated by the same EU requirement) (Aquafin CRC, 2005).

Trends in the *treatment of sewage sludge* are towards incineration, although the structure of disposal is still quite different in the three regions. In Flanders, 72% was incinerated in 2003 and a further plant is to be commissioned in 2006; only 0.8% is

disposed in landfills, with 27% being used for soil improvement. In Wallonia, only about 13% was incinerated in the same year, almost 37% went to landfill and 50% was used in agriculture. Brussels incinerates the sludge from its existing station and plans to use a wet oxidation process to treat the sludge from the station under construction.

Even in a densely settled country like Belgium, a certain proportion of dwellings will always be served by *small-scale or individual treatment systems* because they are too isolated to be connected to a sewerage system. Both Wallonia and Flanders have delineated zones that will not be connected to reticulation networks and communal treatment plants. In Wallonia, about 12% of the population live in such zones and all new dwellings must be equipped with individual treatment plants whose sound operation must be checked annually by certificated maintenance personnel; existing dwellings have until 2010 to comply. Incentives such as construction grants (EUR 2 500 for a single-house installation) and an exemption from the sewage tax of EUR 0.4/m^3 are having some effect, but the rate at which these systems are being installed is far below that needed to meet the 2010 deadline. Similar arrangements exist in Flanders, where 2-5% of dwellings will need to be equipped with individual treatment facilities.

Industrial waste water treatment

In the European Commission's most recent implementation report under the urban waste water directive (Commission of the European Communities, 2004),[15] Belgium identified 99 industrial plants as falling under *Article 13 of the directive*, with a total organic load of 3.46 million p.e. By the end of 2000, 24 of these plants were located in Wallonia and were in conformity with the directive. The other 75 plants were situated in Flanders, where authorities advised that all firms were in compliance with permit conditions by the directive's deadline of the end of 2000; however, some of the plants (representing 19% of the industrial load concerned) did not comply with monitoring requirements and received a penalty. In Flanders, BOD and COD industrial discharges were reduced by 58% and 33% respectively during 1997-2004, and those of nitrogen and phosphorus by 35% and 41%. In Wallonia, industrial discharges (measured as pollution load units factoring in COD, suspended solids, nutrients and heavy metals) fell by about 10% during 1997-2002.

3.4 Discharges of hazardous substances

With regard to *reductions in discharges of hazardous substances*: according to the latest assessment of the Hague Declaration under the North Sea Conferences system, Belgium met the reduction targets for 25 of the 37 substances covered by the

declaration (Figure 7.2). The reduction targets (base year 1985) for discharges to water were met for trichloroethylene (TCE) (–100%), cadmium (–94%), PAHs (–91%), mercury (–78%), lead (–77%) and dioxins (–66%), but not for copper (–16%), tributyltin (TBT) (0%) and hexachlorocyclohexane (HCH, including lindane). The continued presence of many of these pollutants in freshwater fish is worrying, particularly because their sources are often hard to locate. Further action is therefore required: i) to tackle the chemicals listed as priority substances under Annex X of the WFD as well as those identified within the OSPAR framework; and ii) to address new pollutants (e.g. brominated flame retardants, endocrine disruptors) that are causing increasing concern in Belgium and elsewhere.

In Flanders the target of the *MINA plan 3* (a 50% reduction between 1998 and 2010) has not yet been reached for any metal, although significant reductions have been achieved for nickel (–37%), arsenic (–21%), chromium (–29%), zinc (–21%), copper (–16%) lead (–11%) and cadmium (–35%) (MIRA-T 2005). Further improvements will require greater attention to diffuse sources (e.g. soil erosion, chemical fertilisers, wood preservation) of these metals, though this will not be easy as the pollution sources and pathways are different for each metal.

3.5 Preventing damage from floods and inundation

Flood prevention *received increased attention in Belgium* during the review period following the spate of serious flood events that occurred in Europe in recent years. Belgium had 19 significant rainfall episodes between 1998 and 2004, and 243 of Wallonia's 262 municipalities were affected by flooding during 1994-2003. Both Wallonia and Flanders have adopted approaches in line with the document on best practices for flood prevention, protection and mitigation agreed in 2003 by the water directors of the EU countries, Norway and Switzerland.

Flanders adopted the "*retain-store-drain*" *concept*, i.e. to retain water as much as possible upstream of flood-prone areas, provide storage where necessary and possible, and then allow the gradual drainage of flood waters. Flanders also initiated the so-called "water check", which requires all approvals under spatial planning rules to be checked for potential impact on water issues, including flooding; flood hazard maps have been drawn up for all flood-prone areas. Wallonia in 2003 launched a *plan for the prevention and control of flooding* and its effects on flood victims (PLUIES) based on a whole catchment approach and containing a raft of measures including floodplain mapping, land use controls, river control, flood warning and emergency procedures. Municipal flood hazard maps are in preparation. Brussels-Capital launched in 2006 the preliminary works towards a plan for the prevention and control

of flooding, co-ordinated with the installation of underground storm basins. It has also launched a "rain plan" to fight against floods.

Arrangements for *compensating victims of natural disasters* should be an integral part of any coherent system aimed at reducing society's exposure to risks from flooding. In Belgium, such compensation was until recently financed through the federal Disaster Fund. As of 2006, a system of compulsory private natural hazard insurance (linked to fire insurance) will compensate damage caused by "higher probability" events, and the Disaster Fund will come into play only for "lower probability" floods, following official recognition as such by a Royal Decree. The new insurance system undeniably represents a better internalisation of the cost of flooding; even so, it is not clear to what extent, in the aftermath of a flood, victims will automatically restore the pre-existing situation rather than seriously considering ways to reduce their vulnerability to future flooding.

3.6 Expenditure, financing and pricing

Expenditure

Public and private expenditure on *waste water management* were estimated at 0.5% of GDP in 2002, a relatively low figure compared to other OECD countries. A large investment effort in sanitation infrastructure is still required in Belgium, and the investment will need to continue for a generation or so at present funding levels. For example, the report of the Belgian Court of Audit quotes an as yet unprogrammed investment of EUR 7 billion required to construct sanitation infrastructure for the Flemish population not yet served.

Financing of sewerage and waste water treatment systems

Limited progress was made since the previous environmental performance review of Belgium in achieving a greater *degree of cost recovery* in the *financing of sewerage and waste water treatment infrastructure*, which is currently on the order of one-third or less. During the review period, all three regions reformed their financing arrangements for waste water infrastructure investments to: i) relieve the general regional budgets from this investment burden, and ii) overcome the obstacles impeding progress in achieving the requirements of the EU Urban Waste Water Treatment Directive. Most of the revenue raised by the three regional governments from water pollution levies (Chapter 4) is now being transferred directly to the respective financing institutions (Brussels Fund for the financing of water policy, Aquafin and the SPGE). All three regions practise full cost recovery for the *production and distribution of drinking water*.

Wallonia now has in place a *coherent funding mechanism* designed to achieve full cost recovery, and waste water charges are expected to triple over the next ten years. In Flanders, waste water charges would need to double from their 2002 level, but the government has yet to release a long-term vision (first announced in 1997) on how this will be achieved; in the meantime, the gap is filled by regional subsidies to the water companies. In 2001, Brussels-Capital established a water policy fund to finance the construction of the collector system that takes untreated sewage from the region to the large treatment facility now being built just north of the capital. The fund is financed mainly by revenue from regional water pollution levies and a contribution from the Flemish Region, in recognition of the Flemish communities to be connected to the Brussels treatment plant.

Pricing water services to households

The *average price of water* in Brussels-Capital is about EUR 2/m^3, of which approximately EUR 0.7/m^3 is for sewerage and treatment and the rest for water supply. In Flanders, the median price for households is also about EUR 2/m^3 and includes a waste water charge of EUR 0.6605/m^3. Average prices in Wallonia rose by about 25% during 1996-2003 and amounted to EUR 2.34/m^3 in 2004; the waste water treatment component amounted to EUR 0.5229/m^3 in 2005.

Customers of water services receive *combined invoices* for supply and sewage treatment in all three regions. The structure of water pricing in Wallonia is based on a calculation of two factors: one representing the true cost of water supply (the CVD, for *coût vérité distribution*, which includes the cost of protecting water intake areas) and a second one for sanitation (the CVA, for *coût vérité assainissement*).[16] Water bills have a fixed and a progressive, volume-based component. The fixed part is a calculated value based on the basin-averaged, true cost of both supply and sanitation. In Flanders, the cost of sewage treatment is calculated in terms of the number of pollution units, with the unit price adjusted annually and the same for both households and industry.

Pricing structures throughout Belgium have, since 2005, contained a *social component to keep water affordable for low-income groups* (Chapter 5) and a progressive component to encourage conservation. Brussels-Capital has instituted a "solidarity tariff" aimed at benefiting large families, which also retains a progressive structure as a conservation signal. In Flanders, access to drinking water is considered a human right and every inhabitant receives the first 15 m^3 per year free of charge. Since 2004, in Wallonia, water prices have included a charge of EUR 0.0125/m^3 destined for the Social Water Fund and to be distributed to low-income households that would otherwise find it difficult to pay their water bills (Ministère de la Région Wallone, 2005b); in 2004, 6 500 households received a total amount of EUR 867 000,

which represented 63% of the net revenue collected through the charge that year. The Wallon government approved in March 2005 an international water solidarity fund to finance projects for providing water to citizens in developing counties that will be fully operated in 2007. A funding of about EUR 2 million is raised by the contribution of all the consumers (a charge of EUR 0.0125/m^3), on the same scheme as the Social Water Fund.

Notes

1. The fourth daughter directive sets limit values for As, Cd, Ni and PAHs, and monitoring requirements for Hg.
2. The 2005 daily-average target for PM_{10} has not been met in many parts of Belgium. For example, the Brussels-Capital Region exceeded the limit on 155 days in 2002.
3. The Walloon Region has already met its regional NEC target while the Flemish Region needs a further 10% reduction.
4. The EU Commission has identified Belgium as one of the eight EU countries that are not meeting their obligations to transpose the IPPC Directive. (Report of the Commission on the implementation of Directive 96/61/EC concerning integrated pollution prevention and control, 3 November 2005.)
5. The share of PM from the transport sector increased from 30% to 53% during the review period.
6. The subsidies received by NMBS/SNCB amount to 0.4 to 1.0% of GDP yearly.
7. EU overall support for this project is EUR 1.73 million.
8. From 2007 on, the same label will be used in the Brussels-Capital Region and the Walloon Region.
9. The diesel fuel price is around 75% of the gasoline price.
10. In 1998, 57% of the vehicles in Belgium were gasoline and 41% were diesel. In 2004, 51% were diesel and 47% were gasoline.
11. Emissions dropped from 352 to 30 kilotonnes in 2003 for SO_2 and from 87 to 30 kt for NO_x.
12. This figure includes water used for cooling the power stations of which 75% are restored to its origin rivers.
13. It includes herbicides and some biocides which are mostly used by amateur gardeners.
14. For example, the deadline for tertiary treatment for agglomerations >10 000 (i.e. in Wallonia) is the end of 2009.
15. Situation as of end of 2000.
16. Inhabitants and enterprises not or not yet served by a treatment station are still liable to pay the CVA and therefore effectively subsidise those already connected; this also means that the CVA will gradually increase as the connection rate grows.

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3

NATURE AND BIODIVERSITY MANAGEMENT*

Features

- Protecting nature in a densely populated country with fragmented wildflife habitat
- Implementing Natura 2000
- Nature conservation, agriculture and forestry
- Nature conservation on military domains

* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental. Performance Review of 1998. It also reviews progress with respect to the objectives of the 2001 OECD Environmental Strategy.

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the environmental performance review of Belgium:

- complete the *National Biodiversity Strategy* (as required under the UN Convention on Biological Diversity) with close co-operation between regional, federal and local authorities and stakeholders; include quantitative targets, as appropriate;
- strengthen the *management of protected areas* (e.g. new nature parks, agreements with landowners and/or land users) and the *connectivity between protected areas* in the context of Natura 2000, including through enhanced regional co-operation; extend biodiversity corridors by improving the ecological water quality of rivers, as required by the EU Water Framework Directive;
- enhance *nature conservation on farmland*; set targets and periodically evaluate achievements;
- promote *common forest management* among private forest owners, so as to create economies of scale and foster environmentally-friendly land use, thereby enabling sustainable forest management;
- enhance public and private *financing of nature and biodiversity conservation* (e.g. hunting plans and fees to control large game populations, local nature tax on building permits);
- further *implement international agreements* to protect nature and biodiversity (e.g. CITES, CBD).

Conclusions

During the review period, Belgium stepped up very significantly its efforts to protect nature and biodiversity. A comprehensive assessment of biodiversity and inventory of species was completed. *Protected areas* were expanded and now cover 11.6% of the country. Wallonia designated new nature parks and other protected areas, the Brussels-Capital Region set up a "green and blue network", and Flanders established a legal framework for development of the Flemish Ecological Network, of which about 70% has been designated. Nearly 13% of the national territory was designated as part of *Natura 2000*, providing new opportunities to combat fragmentation of habitats, expand protected areas and further involve stakeholders (farmers, forest owners) in nature conservation. Co-operation agreements led to establishment of "chartered reserves" and nature conservation on military domains. Implementation of *sustainable forest management* was actively pursued, and forest

certification increased. Belgium contributed to *international co-operation* concerning migratory species (e.g. designating more Ramsar sites) and trade in endangered species (e.g. stepping up controls and penalties for CITES violations).

However, economic activities in the context of Belgium's very high densities of population (341 inhabitants/km^2) and roads (488 km/100 km^2) exert high pressures on species and habitats, and *the loss of biodiversity is increasing*. If Belgium is to halt biodiversity loss on its territory by 2010 (an EU target adopted in 2001), much needs to be done to further protect species and habitats, expand marine protection, continue with sustainable forestry and better integrate nature concerns into agriculture and land use. The management of protected areas generally needs to be improved and their protection objectives made more explicit (e.g. nature parks in Wallonia). Efforts to combat fragmentation should be continued. Financial resources for biodiversity need to be significantly increased and *economic instruments* more widely used. The biodiversity objectives of the federal plan for sustainable development need to be followed up by federal biodiversity action plans, and regional comprehensive packages of actions focusing on sustainable agriculture, sustainable forestry and habitat protection should be further developed and implemented.

♦ ♦ ♦

1. Policy Objectives

The Royal Belgian Institute of Natural Sciences sounded the alarm recently: *half of the plant and animal species found in Belgium are under threat*, mainly because of: i) inadequate land use; ii) pollution; iii) invasive alien species; iv) excessive use of natural resources; v) growth in leisure activities and tourism; and possibly vi) the growing impact of climate change.

Belgium has committed itself to *halting biodiversity loss on its territory by 2010* (a target adopted in 2001 at EU level, and reiterated at the 2002 World Summit in Johannesburg and subsequent European Environment Ministers' Councils). Federal plans for sustainable development for 2000-04 and 2004-08 contain broad objectives for species protection, as well as commitments to protect the marine environment (e.g. establishment of protected marine areas, protection of marine species), to implement sustainable forestry and to "revise" agricultural policy (Federal Government, 2000, 2004).

In Flanders, environmental policy plans for 1997-2001 (MINA 2) and 2003-07 (MINA 3) aim at the development of a *Flemish Ecological Network* (FEN) of

125 000 hectares (ha) and an "interweaving network" of 150 000 ha (Box 3.1). This entails expanding nature areas[1] and woodland (respectively by 38 000 ha and 10 000 ha by 2007) and extending the protected areas with approved management plans (to 50 000 ha by 2007).

In Wallonia, the environmental plan for sustainable development (adopted in 1995) seeks to create favourable conditions for wildlife development on the entire Walloon territory by restoring "natural features" in urban and rural landscapes and promoting education on nature conservation. A *Walloon biodiversity strategy to 2010* is being prepared to provide a long term framework for nature conservation.

The 2001 regional development plan for Brussels-Capital provides for a "*green and blue network*" that connects green areas and water bodies (Box 3.2).

Box 3.1 **The Flemish Ecological Network**

The Flemish Ecological Network (FEN) is rooted in Flanders' Nature Conservation Decree and Spatial Structure Plan. The FEN aims to connect fragmented nature and forest reserves into larger units and echoes a number of international obligations to create *ecological networks and corridors* (e.g. EU Natura 2000, the Convention on Biological Diversity, the Ramsar and Bern Conventions). It aims at sustainable nature conservation in sites designated as nature and forest reserves.

By 2007, *the network should consist of 125 000 ha of FEN core areas (large nature units*) and should be supported by 150 000 ha of "nature interweaving areas" (NIWAs), consisting of areas with mixed functions (e.g. agri-environmental schemes) and by interconnecting areas (corridors). As specified in the Flemish Spatial Policy Plan, an additional 38 000 ha of nature areas and 10 000 ha of woodland areas must be allocated on provincial spatial plans by 2007 (mainly at the expense of agriculture areas), as a basis for demarcation of new FEN core areas. By the end of 2004, the Flemish provinces had only allocated 10 650 ha of additional nature areas and 1 372 ha of woodland areas, and a total of only 85 500 ha of FEN core areas had been demarcated.

The Flemish Spatial Policy Plan also provides for demarcation of *NIWAs* on 70 000 ha of agricultural areas and 80 000 ha of recreation, woodland and other "green" areas. By the end of 2004, only 768 ha of NIWAs (0.5% of the 2007 target) had been demarcated.

As regards *interconnecting areas*, no maximum surface is prescribed. Their demarcation and management is a responsibility of the provincial authorities.

Box 3.2 **The green and blue network of the Brussels-Capital Region**

In the Brussels-Capital Region, green and blue spaces (nature and water areas) are rare but are of great recreational value. The region has no specific nature conservation plan, but it aims to integrate nature and biodiversity concerns into general policy and to connect the different green areas to create the so-called "green and blue network". The *Brussels-Capital Region has already designated 2 320 ha (14% of its territory)* as a Natura 2000 area; this area includes the region's nature reserves, the Sonian forest and biodiversity corridors, such as the Valley of the Woluwe.

Joint management, often between the Brussels Institute for Management of the Environment (IBGE-BIM), NGOs and private owners, is key to the success of the green and blue network. A typical example is the 10-ha "Hof Ter Musschen" area located east of Brussels and owned jointly by the community, the Catholic University of Leuven and a private company. The former farm has been designated a Special Area for Conservation (SAC) under the EU Habitats Directive, because of its reed and calcareous wet grasslands. A joint management plan and nature reserve status has been proposed for the area.

The *OECD's 1998 Environmental Performance Review* of Belgium recommended that the country:

– give higher priority to nature conservation;

– urgently complete and implement specific nature protection plans and biodiversity strategies, including measurable objectives and deadlines;

– expand protected areas on the basis of a strategic overview of sites of high ecological value; make protected areas more representative, e.g. by protecting permanent grasslands;

– enhance the protection of ecological values outside protected areas and forests;

– strongly implement the provisions for ecological networks at the local level through land-use planning procedures;

– devise economic and other instruments to encourage farmers and other private owners to protect nature on their property (including forested land, small landscape elements);

– continue raising the nature awareness of the public and of local bodies;

– further pursue the efforts already begun to improve the knowledge base with respect to biodiversity and nature conservation;
– continue to implement sustainable forestry management on the basis of already accumulated experience, with due regard to the economic, ecological and social functions of forest resources;
– adopt and implement proposed legislation aiming to protect marine species and habitat.

2. State of Biodiversity

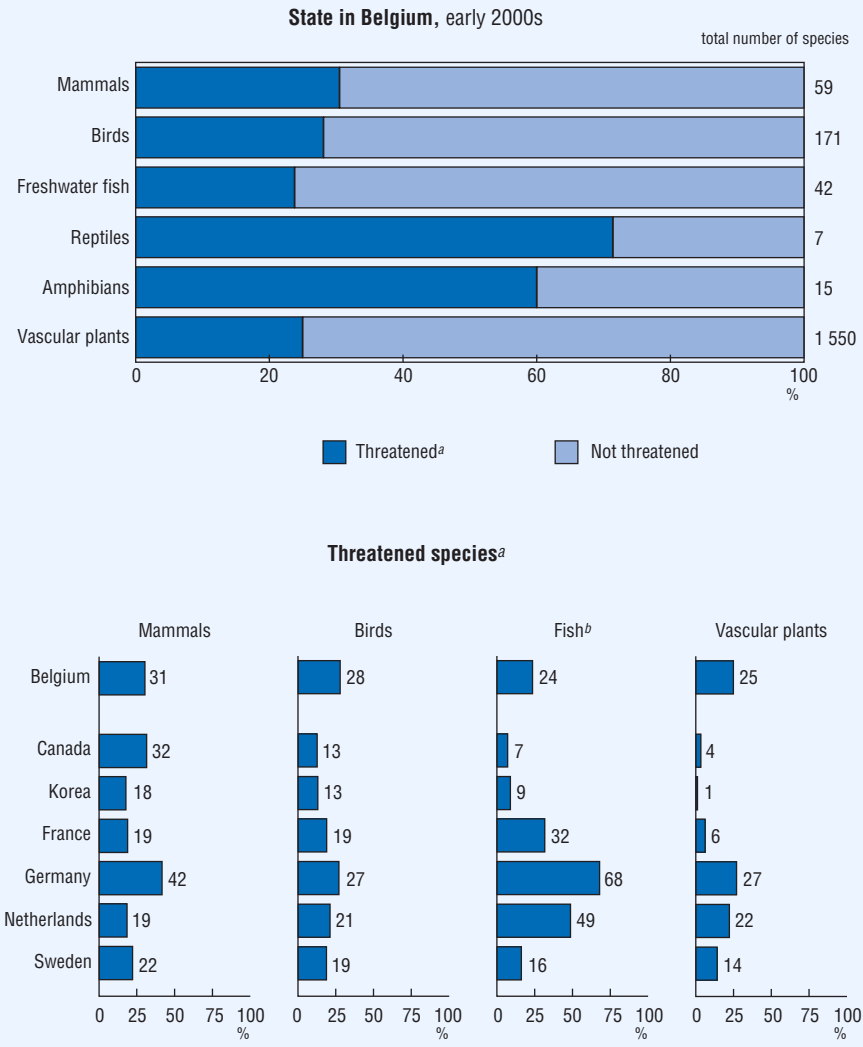
2.1 State of species

The *first comprehensive assessment of Belgium's biodiversity*, "Biodiversity in Belgium", was released in 2003 (Peeters *et al.*, 2003). It is also the first countrywide inventory of species, and includes information on habitats and pressures on nature and biodiversity. Overall, the document provides a solid basis for species conservation.

A *significant portion of Belgium's fauna and flora is under threat*, both in absolute terms and by OECD standards (Figure 3.1). The situation is serious in all three regions (Table 3.1). Species like the bottlenose dolphin, the sturgeon, the ortolan bunting, the yellow-bellied toad and the migratory locust have become extinct in recent decades (Peeters *et al.*, 2003). No fewer than 85 species of vascular plants have become extinct since 1972. Since 1990, populations of breeding birds have decreased in open (grassland) and agricultural habitats. This is the case for the corn bunting, partridge and skylark in Wallonia, and for the house martin, meadow pipit, skylark, tree sparrow and some bunting species in Flanders. Most reptiles and amphibians are threatened in Belgium.

In *Flanders*, the most critically endangered mammal species are the hamster and the garden dormouse, while protection of bat species seems to have improved (Institute of Nature Conservation, 2005). The 2005 IUCN (International Union for the Conservation of Nature and Natural Resources) Red List of Threatened Species includes nine new bird species found in Flanders, though 11 other species are no longer listed having shown good recovery (e.g. cormorant, kingfisher and barn owl). Freshwater fish species are recovering, especially in large rivers due to improved water quality (Chapter 2). However, only one fish sampling point meets the requirements of the EU Water Framework Directive (00/60/EC). Considerable efforts will be needed to meet the directive's requirements for all sampling points by 2015. Moreover, only 7% of the 812 barriers to fish migration on primary water courses have been removed, resulting in a slight increase in migratory fish in large

Figure 3.1 **Fauna and flora**



a) IUCN categories "critically endangered", "endangered" and "vulnerable" in % of known species.
b) Freshwater fish only except for Canada.
Source: OECD Environment Directorate.

rivers. It is estimated that, at this pace, only 20% will be removed by 2010. Strengthened efforts are required to meet related domestic and international commitments.[2]

In *Wallonia*, 57% of known species show a clear population decrease. The most critically endangered species are (in decreasing order of threat) reptiles, day butterflies, freshwater fish, dragonflies, superior plants, carabids and amphibians. These often have narrow habitat ranges, such as semi-natural grasslands, heathlands, peatlands and forests, and are highly susceptible to habitat deterioration and fragmentation. Some success stories have been recorded, such as the return of the black stork (10 couples) due to habitat improvement.

Table 3.1 **State of flora and fauna,**[a] by region

	Known species	Threatened species[b]	
		Number	% of known species
Flanders			
mammals	45	13	*29*
birds	155	41	*26*
reptiles	5	3	*60*
amphibians	13	4	*31*
freshwater fish	42	8	*19*
vascular plants	1 305	251	*19*
Wallonia			
mammals	50	14	*28*
birds	143	42	*29*
reptiles	7	5	*71*
amphibians	12	7	*58*
freshwater fish	33	20	*61*
vascular plants	1 000	. .	. .
Brussels			
mammals	35	18	*51*
birds	74	27	*36*
reptiles	3	3	*100*
amphibians	7	7	*100*
vascular plants	723	230	*32*

a) Indigenous species.
b) Critically endangered, endangered and vulnerable species. Excludes extinct and undocumented species.
Source: Royal Belgian Institute of Natural Sciences; INS.

2.2 Major pressures on species diversity

Expansion of urban and industrial areas over the review period led to *habitat degradation, fragmentation and loss*, with remaining habitats becoming smaller and more isolated. In Flanders, land development for residential use increased by 25% over the last ten years, and land development for industrial use increased by 29%. In Wallonia, built-up areas have increased by 28.5% since 1980.

The entire Belgian territory has been designated as sensitive to *eutrophication* under the EU's 1991 Urban Waste Water Treatment Directive (Chapter 2). Eutrophication can increase biodiversity, at least locally. Birds are attracted to lakes and wetlands affected by eutrophication, for example. But where eutrophication becomes predominant, overall diversity is likely to decline because the species typically associated with nutrient-poor habitats will gradually disappear. The *two main causes* of eutrophication, over-fertilisation and atmospheric nitrogen deposition, remain of concern. The surplus of nitrogen and phosphorus on the Flemish agricultural soil surface has decreased, but domestic targets have not yet been met (Chapter 2). The intensity of fertiliser use in Belgium (10.8 tonnes/ km^2 of agricultural land) is still very high by OECD standards (Figure 2.6). Atmospheric nitrogen deposition barely decreased over the last decade,[3] as Belgium made insufficient progress in reducing emissions (particularly NO_x emissions,[4] more than half of which originate from transport).

Atmospheric sulphur and nitrogen deposition contributes to *acidification*. Although SO_x emissions decreased considerably over the review period (Chapter 2), acidifying depositions continue to damage ecosystems. In Flanders, the critical loads for fertilisation and acidification are exceeded, respectively, on 53.1% and 92.3% of the main habitats (grassland, forest, heath), far above the respective MINA-plan targets of 20.4% and 81.7% by 2010.

An inter-regional working group on *invasive alien species* (IAS) was recently created to try to develop a common control strategy across Belgium. In Flanders, 16 plant and 21 vertebrate species represent a major threat to indigenous species. Management plans were established to eradicate the muskrat, black cherry[5] and floating pennywort, and first steps have been taken regarding the Canadian and Egyptian geese.

Species protection plans have been set up to recover declining populations, such as hamster and bat (Flanders and Wallonia); salmon, black stork, corncrake, otter and freshwater mussel (Wallonia); badger, white stork, fish eagle and tree frog (Flanders). Some of the plans are carried out in the EU framework: for example, LIFE-Nature projects aim at conserving habitats and species of EU interest, according to the Birds and Habitats Directives.

3. Protected Areas

3.1 Various types of protected areas

Belgium's extremely dense population (341 inhabitants/km^2) and road network (488 km/100 km^2) leave *little space for natural habitat preservation*. Nevertheless, both the size and number of protected areas increased significantly over the review period. *Nature reserves*, which have the most stringent form of protection in Belgium (IUCN Category IV), significantly increased in number and area over the last ten years and now cover approximately 40 000 ha. *Forest reserves* also increased in number and area, but they account for less than 3 000 ha overall and their level of protection is less stringent (IUCN Category V). Taking into account the *six new nature parks* created in Wallonia since 1995, which cover an area of nearly 220 000 ha, some 11.5% of the national Belgian territory (i.e. nearly 350 000 ha) receives some sort of protection (Table 3.2). However, the level of protection in these recently established nature parks is still to be enhanced. They currently intend to protect natural assets while allowing for rural and economic development. Since 2006, Flanders has had one national park. Other types of protected areas in Belgium include *wetlands* of national interest, Ramsar sites and caves of scientific interest, and *five marine reserves* (covering 43 000 ha). Efforts have been made to promote nature conservation on *military sites* (Box 3.3).

Protected areas in Belgium, with the exception of nature parks and five Ramsar sites, tend to be *small and fragmented*. Only two nature reserves cover more than 1 000 ha; 252 (mostly privately-owned nature reserves) cover no more than 10 ha. In this context, the new nature parks in Wallonia, the green and blue network of the Brussels-Capital Region, and the Flemish Ecological Network (FEN) are highly commendable initiatives (Boxes 3.1, 3.2).

The 1998 OECD Environmental Performance Review recommended making protected areas more representative, notably by better *protecting the permanent grassland* that covers 535 000 ha, or 17.6% of the country's land area. Some efforts have been made. For example, in Flanders, grasslands that are more than four years old and are included in the FEN cannot be converted. However, half of the 60 000 ha of "historic" permanent grasslands in the region have no protection status.

In the *Walloon Region*, nature parks suffer from poor financing and unclear management objectives. Their status is currently under review, and more explicit protection objectives are to be defined. The level of protection of wetlands of biological interest was enhanced in 1997, but current regulations still permit fishing and hunting. Measures have been taken to protect aquatic habitats such as freshwater

fish spawning grounds and river banks. Since 1997, 60 new caves of scientific interest have been put under protection.

In *Flanders*, only 60% of nature reserves (i.e. 16 000 ha) have a legal status and an approved management plan. NGOs manage 54% of these "legal" reserves (in area), for which they receive subsidies from the region; the Flemish Environment, Nature, Land and Water Administration (AMINAL) manages 45% of the reserves; and private owners or local authorities manage less than 1%. NGOs (55%) and AMINAL (45%) share the management of other nature reserves without legal status. All forest reserves are government-owned.

Table 3.2 **Inland protected areas,** 1995-2004

	Flanders		Wallonia		Brussels-Capital		Total	
	Number	Area (ha)	Number	Area (ha)	Number	Area (ha)	Number	Area (ha)
Nature reserves[a]								
2004	841	26 859[b]	406	12 879[c]	10	119	1 257	39 857
1995	118	5 849	90	5 633	9	89	217	11 571
Forest reserves[d]								
2004	44	2 273	12	548[e]	7	121	63	2 942
1995	15	973	8	245	6	100	29	1 318
Nature parks[d]								
2004	–	–	9	306 971	–	–	9	306 971
1995	–	–	*3*	89 695	–	–	*3*	89 695
Total								
2004	885	29 132	427	320 398	17	240	1 329	349 770
1995	133	6 822	101	95 573	15	189	249	102 584
Change 2004-1995 (%)		*327*		*235*		*27*		*241*

a) Mostly IUCN category IV (managed nature reserve or wildlife sanctuary, allows some sustainable use of products), but also includes protected areas with no IUCN category assignment.
b) Including 78 government nature reserves and 300 NGO nature reserves with a total area of 16 037 ha. The remaining 10 822 ha are nature reserves owned and managed by NGOs or the government, but not yet with a legal status (this includes "chartered nature reserves" owned by the Ministry of Defence and managed by the government).
c) Including 301 public nature reserves (9 304 ha), i.e. "government nature reserves" (RND), "chartered nature reserves" (RNA) and wetlands of biological interest (ZHIB); as well as 105 private nature reserves (3 575 ha). Excluding 61 caves of scientific interest (CSIS).
d) IUCN category V (protected landscape, allows tourism and recreation).
e) Excluding conservation areas in forest management plans.
Source: Instituut voor Natuurbehoud; DGRNE; IBGE-BIM; MUMM.

Box 3.3 **Nature conservation on military domains**

In the 1990s, nature conservation on military sites in Belgium was based on *ad hoc* contracts and management agreements between military commanders and nature conservation bodies, often NGOs. This changed considerably during the review period. Half of the country's military area – 18 000 of 36 000 ha – was designated as Natura 2000 sites, accounting for *11% of Belgium's Natura 2000 sites*. In addition, some military sites with a high ecological value have been identified as "protected military sites" and are not accessible to the public except through guided visits. Funds for nature conservation in military areas come from the Ministry of Defence, regional governments, the EU and income from wood sales. Notably, funds provided by the EU Life-Nature Programme support management of the most important natural areas in Belgium's military zones.

The federal Ministry of Defence and the Flemish Administration (AMINAL) signed a *co–operation agreement* in 1999 for the management of Natura 2000 sites on military sites in Flanders. The agreement covers open grasslands, mires (peat-forming habitats), wetlands and developed forests. For several areas, objectives have already been developed and measures are being implemented. The management planning and implementation for 9 400 ha designated as a Special Protection Area under the Birds Directive has now received an important impetus through a Life-Nature project (2004-08) covering 12 military domains in Flanders (European Commission, 2005).

Federal authorities, in collaboration with regional administrations and scientific institutions, have taken measures to preserve habitats of *threatened mammal species* to encourage their return in a number of military areas: examples include the otter (in the camp de Marche-en-Famenne et de Lagland), bats (in ancient fortifications) and the lynx (in the camp d'Elsenborn).

In the *Brussels-Capital Region*, adoption of the New Regional Zoning Plan (known as the "PRAS") in 2001 gave legal protection to some (but not all) semi-natural sites with high biodiversity (as a sub-category of "green spaces"). The PRAS is the basis on which all building permits are issued in the region.

3.2 The Natura 2000 ecological network

The Belgian Natura 2000 ecological network, initiated in 1993, is being implemented at both federal (marine sites) and regional levels. About 386 500 ha have been delineated inland, accounting for *12.6% of the national territory* (including inland waters): this includes 221 000 ha in Wallonia, 163 000 ha in Flanders and

2 320 ha in Brussels-Capital, i.e. 13.1%, 12.1% and 14.3%, respectively, of the regional territories. In addition, 12% of Belgium's exclusive economic zone (i.e. some 43 000 ha) in the North Sea has been included in the Natura 2000 network.

The Natura 2000 network consists of Special Areas for Conservation (SACs) under the EU Habitats Directive and Special Protection Areas (SPAs) under the EU Directive on the Conservation of Wild Birds (the Birds Directive). Most of Belgium's nature and forest reserves are totally or partially included in the network. However, the *level of protection* required for SACs and SPAs is less stringent than for nature and forest reserves. The Brussels-Capital Region is planning to give some SACs the status of nature reserves. Overall, Belgium has 58 habitats of community interest, according to Annex I of the Habitats Directive, including 12 priority habitats. The connectivity of the network could benefit from the ongoing efforts to improve the ecological quality of rivers, as required by the EU Water Framework Directive.

In 2005, three SPAs and two SACs were legally designated in the *Belgian marine area*. Voluntary agreements were signed with user groups to regulate the activities in these areas.

In *Wallonia*, the Natura 2000 sites were delineated on the basis of the hydrographical network, ensuring *good connectivity* among them. They host 101 bird species and 31 other species of community interest. But these delineated sites have yet to be legally designated and their level of protection confirmed. The decisions ("*arrêtés*") to designate Natura 2000 sites will include conservation objectives. The Walloon legislation on Natura 2000 entered into force *in 2002*. With 15% of the delineated sites being farmland, the region is pursuing management agreements with farmers which include the provision of regional funding (as part of rural development plans). Tax disincentives, such as reduced concessions on death duties and real-estate tax, will apply to properties located within the network.

In *Flanders*, the Natura 2000 sites were delineated on the basis of "biological evaluation maps", taking account of the hydrographical network. As in Wallonia, Flemish legislation on Natura 2000 entered into force *in 2002*. The legislation requires a "nature objective plan" to be prepared for each site, based on a participatory approach (involving advisory and steering committees). The draft plans must undergo public review before being approved by the region. The Nature Division of AMINAL co-ordinates and provides technical support for the preparation of these plans, for which additional staff was hired. A matrix was developed by AMINAL to evaluate both the habitat conservation status and the performance in meeting site-specific conservation objectives. A similar matrix has recently been prepared for species.

The *Brussels-Capital Region* is home to 29 species of community interest, including 17 bat species. Management plans for Natura 2000 sites, including measurable objectives, are under preparation.

4. Integration of Biodiversity into Agriculture, Forestry and Land-Use Planning

A European Community Biodiversity Strategy was adopted in 1998[6]"to anticipate, prevent and attack the causes of significant reduction or loss of biodiversity at the source". Four *sectoral Biodiversity Action Plans* (BAPs) were then adopted by the European Commission in 2001, including one for agriculture. However, Belgium has yet to prepare national or regional BAPs for the agriculture and forestry sectors, addressing biodiversity in these sectors through other planning instruments (environmental policy and rural development). The second federal plan for sustainable development (2004-08) provides for preparation of federal BAPs in four sectors: transport, science, economy and development co-operation. Consultations have started with these sectors (Federal Government, 2000, 2004).

Approximately 20% of SACs and SPAs (some 77 000 ha) are located on *farmland*, about 40% are on *forest land* (150 000 ha in Wallonia or 30% of the forest productive area) and the rest are on other land use categories, including protected areas. Future steps by the agriculture and forestry sectors to address biodiversity should therefore also be considered *in the context of Natura 2000 implementation*. The Belgian authorities should i) identify the right (economic, fiscal) incentives to have farmers and foresters further develop management agreements and conservation easements, and, as appropriate, ii) provide guidance for the use of public funding and set eligibility criteria.

4.1 Agriculture

Little was achieved during the review period to meet the commitments of the Federal Plan for Sustainable Development (FPSD) and regional commitments[7] to reduce pesticide use, strengthen agri-environmental schemes and encourage organic farming. The intensity of *pesticide use* in Belgium (0.69 tonnes/km^2 of agricultural land) is still very high by OECD standards (Figure 2.6). The area under *agri-environmental measures*[8] (AEMs) remains low (10% of farmland in Flanders, 6% in Wallonia) (Chapter 4). By comparison, AEMs now cover more than a third of the EU-15 farmland. Only 12% of the Belgium area under AEMs is specifically targeted at landscape and nature conservation. The farmland enrolled in AEMs in Belgium increased only recently, in contrast with a significant increase in the EU-15 over the review period.

In 2004 *certified organic farming*[9] accounted for only 1.7% (i.e. some 24 000 ha) of Belgium's Utilised Agricultural Area (UAA), far below the FPSD target and EU-15 average of 4% for that year. The FPSD target for 2010 is 10%. Organic farming boomed following the food safety crises of 1999-2001, but has stabilised (and even slightly decreased) since 2002. It is not clear whether the current phase of consolidation for organic markets will lead to further growth of the sector. This will probably depend on future levels of agricultural policy support (Chapter 4). In 2004, EUR 26 million was spent on AEMs (of which the EU contributed EUR 14 million), accounting for 25% of the total expenditure under Belgium's rural development plan.

4.2 Sustainable forest management

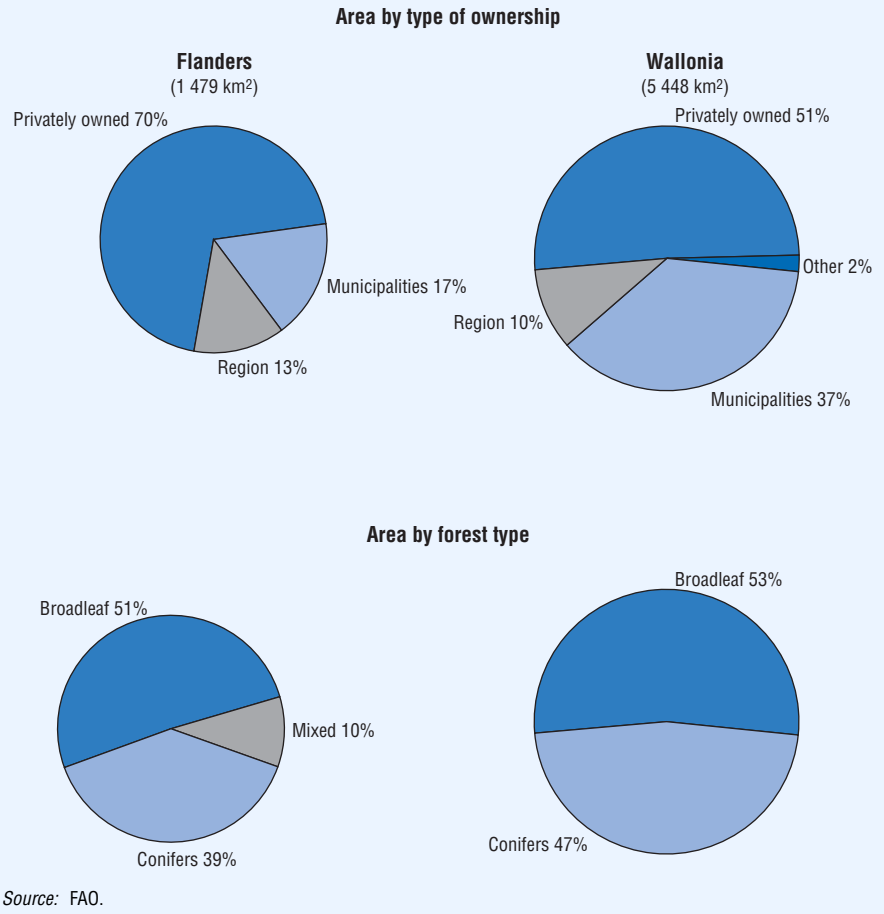
The Belgian forest area has increased by only 1.5% (10 000 ha) since 1995, mostly on abandoned farmland, reflecting a very small uptake of EU support for farm forestry.[10] Most (80%) of the country's forests[11] are located in Wallonia, where they cover a third of the regional territory (Cellule État de l'Environnement Wallon, 2005). Overall, 56% of Belgian forests are privately owned (Figure 3.2). Priority tree species for afforestation are gradually shifting from conifers (pine, spruce) to broadleaves (oak, beech). In 2004, EUR 25 million was spent on *forestry in Wallonia* (of which EUR 3 million, in the framework of Belgium's rural development plan for 2000-06).

Certification of sustainable forest management (SFM) has developed significantly in recent years. As of January 2006, 45% of Walloon forests (i.e. 245 500 ha) were certified under the Programme for the Endorsement of Forest Certification (PEFC); 93% of these were public forests (PEFC, 2005). The number of PEFC-certified firms rose from 5 to more than 60 between 2003 and mid-2006. While the Walloon Region implements the PEFC, the Brussels-Capital and Flemish Regions apply Forest Stewardship Council (FSC) criteria. There are 6 000 ha of FSC-certified forests in Belgium and 85 firms have received a FSC chain of custody certificate. Both certification schemes are internationally recognised.

In comparison with traditional forest management, *PEFC certification* involves: i) greater diversity in the choice of tree species and, for a given species, allowing a mix of provenances in the same region; ii) a more diversified age structure; iii) maintaining some dead trunks after natural tree falls to enhance biodiversity; and iv) creating integral reserves (with no human activity) in areas of difficult access. PEFC certification involves less monitoring and reporting than *FSC certification* and is generally thought to be more suited to small forest holdings.

Measures have recently been taken to *further promote certification*. A PEFC Belgium website was launched in 2004 to raise awareness among private forest owners

Figure 3.2 **Forest in Belgium**



Source: FAO.

and industry. Since 2006, federal public procurement of FSC- or PEFC-certified wood products has been made preferential, as is already the case in some other EU countries (e.g. Denmark, United Kingdom). Since November 2005, external audit in PEFC-certified private forests has been subsidised in Wallonia. This subsidy will be offered for the coming three years, until the market for certified wood products grows.

Measures have been taken to improve *game management*. Since 2000, agricultural policy has encouraged farmers to grow game covers (e.g. cereals and

brassicas) on land counted as part of their set-aside commitment. In 2005 the minimum eligible area was decreased and administrative procedures were simplified to make the scheme more attractive (given its limited success). In Wallonia, an anti-poaching brigade was established in 2003 to prevent violations of the Nature Conservation Law, the Fishing Law and the Forestry Code. In that region, however, populations of large game have increased too rapidly (Figure 3.3), to the point of threatening forest regeneration. For instance, nearly 20% of young spruce stands have been damaged. The spread of large game partly results from hunting interests overriding sustainable forest management considerations. In Flanders, wildlife management plans and hunting schemes apply on 60% of the huntable space.

In *Wallonia*, forest biodiversity guidelines have been prepared to improve forest management. A decision was taken in 1997 to renew the management plans in all public forests by the end of 2006, and to promote the adoption of such plans in private forests.[12] However, by the end of 2005 only half of the public forest area had adopted new management plans, and there is no clear incentive other than PEFC certification for private owners to improve forest management. *Forest condition* (as measured by defoliation) improved significantly in the 1990s, especially for conifers, but it has deteriorated since 1999, especially for beeches, as a result of drought and biotic factors (Figure 3.3).

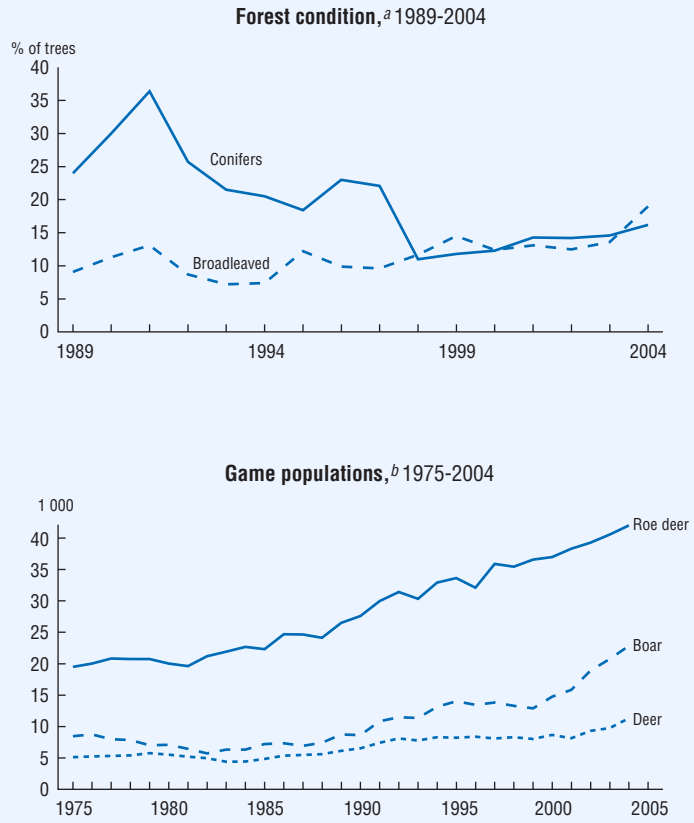
In *Flanders*, forests are very fragmented and 70% are privately owned. Private owners (of at least 5 ha) have been encouraged to share forest management by joining up in "forest groups" (De Schepper *et al.*, 2001). Financial and technical support is provided to the seven such groups that have been accredited so far,[13] to help them prepare SFM plans (on the basis of criteria for sustainable forest management). Forests included in the FEN are exempt from inheritance tax. Just 14% (5 700 ha) of the Flemish public forests are FSC-certified.

4.3 Land-use planning

Belgium's *high and growing pressures to build roads and buildings on available land have* been mainly at the expense of permanent grassland (partly converted into cropland), while the forest area has remained stable. Nearly a third (32%) of Belgium's land area is built up, and there are 149 000 km of road networks (from 140 000 km in 1990). To increase the amount of land under protection, further efforts must be made to integrate nature conservation into land-use planning.

The *Flemish Spatial Policy Plan* (1998-2007) provides for expanding the region's "green zones" by 38 000 ha of nature areas and 10 000 ha of forest areas, in the context of establishment of the Flemish Ecological Network (FEN).

Figure 3.3 **Selected features of the Walloon forest**



a) Trees with more than 25% defoliation.
b) Number of living animals after the hunting season and before birthing.
Source: MRW-DGRNE-DNF.

Between 1998 and 2004, only 10 650 ha of nature areas and about 1 400 ha of forest areas were added to local land-use plans (so-called "spatial implementation plans") at the provincial and municipal levels (Box 3.1). This poor performance reflects strong competing claims for land use in Flanders, impeding the full and timely establishment of the FEN. All development projects entail a revision of local land-use plans using an established consultation process with AMINAL and the general public.

The Walloon Code of Town and Country Planning, Urban Development and Heritage (CWATUP) regulates land-use planning at the regional level. Urban development is restricted on agricultural areas, forest areas, green areas, nature areas and park areas. A permit is required for any land clearing. In addition, the *Walloon Region* uses (voluntary and non-binding) municipal plans for nature development (PCDN). Although preparation of such plans does not follow a formal process, regional funding is available to promote their adoption by municipalities: 48 towns have adopted PCDN, of which 22 since 1998.

5. Expenditure and Financing

Public expenditure on biodiversity and landscape protection in Belgium amounted to EUR 130-150 million annually during 2000-03, an increase from EUR 90-110 million a year during 1996-99. The share of investment expenditure steadily increased, from 11% in 1996 to 44% in 2003 (Table 3.3). In Flanders, 80% of the expenditure on nature conservation was devoted to land acquisition and, to a lesser extent, NGOs. The extent of cost recovery has remained extremely low, with revenues on the order of EUR 2-3 million a year (Table 3.3).

Table 3.3 **Public expenditure on biodiversity and landscape protection**

(EUR million)

	1996		2003	
	Total	(%)	Total	(%)
Investment	10	*11*	56	*44*
Current	78	*89*	70	*56*
EXP1[a]	88	*100*	126	*100*
Subsidies/transfers	0		4	
Fees/purchases	6		10	
Revenues	3		2	
EXP2[b]	91		138	

a) "Abater" principle: expenditure for measures executed by the nature conservation sector itself (e.g. land acquisition).
b) Financing principle: EXP1 plus expenditure financed by others (through public subsidies or fees to specialised producers) less revenues (payments received for services, such as entrance fees).
Source: FPS Economy – Directorate-general Statistics Belgium; OECD.

As regards *sectoral expenditure*, Belgium spent EUR 26 million on *agri-environmental measures* in 2004, of which some EUR 3 million was specifically targeted at landscape and nature conservation. That year, Wallonia spent EUR 25 million *on forestry*, of which half was on operation and maintenance (forest management) and half on investments (afforestation). Revenues from *hunting fees* represent almost 20% of management income in public forests.

6. International Commitments

6.1 Convention on Biological Diversity

Since ratification of the *UN Convention on Biological Diversity (also known as CBD or the Biodiversity Convention)* in 1996, Belgium has submitted three national implementation reports as well as several thematic reports (on protected areas, forest ecosystems, implementation of the Global Taxonomy Initiative). However, preparation of the ten-year *national biodiversity strategy* started only in 2004 and is still to be completed. The steering committee on the Biodiversity Convention of the Co-ordinating Committee for International Environmental Policy (CCIEP), which regroups federal and regional authorities and stakeholders, has elaborated a first draft of the strategy, which was submitted to public consultation in April and May 2006. Endorsement by the Interministerial Conference for the Environment will be sought.

Since 1999 the Belgian *Clearing-House Mechanism* (CHM) for the Biodiversity Convention, managed by the Royal Institute for Science, has helped developing countries start their own CHM and implement the Global Taxonomy Initiative. This assistance involved federal funding of EUR 500 000 in 2005 (to increase to 750 000 EUR by 2007). A Belgian Biosafety CHM[14] was launched in 2001; it is managed by the Scientific Institute of Public Health.

6.2 Migratory species

Under the *Bonn Convention on the Conservation of Migratory Species of Wild Animals*, Belgium ratified (in 2003) the agreements aimed at conservation of bats in Europe (EUROBATS) and of small cetaceans of the Baltic and North Seas (ASCOBANS). It recently (April 2006) has ratified the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) and has provided support to protect meadow-nesting birds through implementation of EU agri-environmental measures.

Conservation and restoration of wetlands is another key component of AEWA. In 2003 Belgium designated three new *Ramsar sites* (all in Wallonia), which brings the country's total to nine sites covering some 43 000 ha. In Flanders, any

development project in wetland habitat requires an environmental impact assessment and specific derogation. All Ramsar sites in Flanders have been designated as Special Protection Areas under the EU Birds Directive, and the intention is to delineate nature conservation areas (including SPAs) in marine waters as part of the country's sea-use planning.[15] In 2004 construction of an offshore wind farm was authorised following assessment of potential impacts on wild birds. The area for which the permit was given lies outside the Ramsar site of the Flemish Banks.

Both the third meeting of AEWA parties (Dakar, October 2005) and the ninth meeting of Ramsar parties (Kampala, November 2005) concluded with an urgent call for better information on the development of the *highly pathogenic avian influenza* (subtype H5N1) in *wild birds*. The 2003 outbreak of avian influenza (subtype H7N7) among birds in Belgium was successfully stamped out using rigorous control and biosecurity measures.

6.3 Washington Convention (CITES)

Belgium implements the *Convention on International Trade in Endangered Species of Wild Fauna and Flora* (CITES) by implementing EC Council Regulation 338/97 and Commission Regulation 1808/2001 modified by Regulation 865/2006. Responsibility for implementing CITES lies with the Federal Public Service for Health, Food Chain Safety and the Environment, the customs service, which has specialised staff, and the federal police force. Since 2004, however, enforcement of CITES has been given low priority by the federal police (Chapter 7). Strengthened controls could well concentrate on the port of Antwerp and airports.

The most frequent alleged *infractions* involve amphibians, reptiles and birds of prey, and products such as caviar and ivory. In 2004, Belgium reported 31 seizures of reptiles and 18 of ivory. Illegal imports of caviar are not unique to Belgium, but such imports involve serious depletion of sturgeon stocks. Strengthened efforts to control ivory imports are also needed, particularly those originating from Belgium's former colonies.

In December 2004, penalties for *violations were increased* and now include six months' to five years' imprisonment and/or a fine of EUR 5 500 to EUR 275 000 (compared with previous penalties of 15 days to 3 months and/or EUR 125 to EUR 12 500).

6.4 Antarctic Treaty System

Belgium is promoting a policy of strict conservation of the Antarctic land area. Through its active involvement in the Commission for the Conservation of Antarctic

Marine Living Resources (CCAMLR), it also promotes the creation of *marine protected areas* around the "White Continent". Being one of the 12 original signatories of the 1959 Antarctic Treaty, Belgium ratified in 2005 the 1991 Madrid Protocol on environmental protection.

6.5 Other conventions

With its 2004 ratification of the 1946 *International Convention for the Regulation of Whaling* and its 1956 Protocol, Belgium joined forces with other countries that protect whales. Within the Conservation Committee, Belgium has initiated and co-ordinated work to reduce the impact of vessel collisions on cetaceans. A Belgian expert recently participated as the only European member of an exploratory mission that assessed whale populations in Antarctica.

In 2004 Belgium ratified the 2000 *European Landscape Convention* (Florence Convention in 2004). This convention aims at encouraging public administrations to carry out a landscape management policy at local, regional and national levels that focuses on protecting the quality of the European landscape. In Belgium, matters relating to landscape fall under the authority of the communities and regions.

6.6 Official development assistance

As part of its official development assistance, Belgium provides support to help manage five *World Heritage sites* (national parks) in the Democratic Republic of Congo; during 2005-07 the support was increased to EUR 350 000/year (from EUR 200 000/year in previous years). Belgium also contributes EUR 1.7 million a year, as part of its contribution to the UN Environment Programme (UNEP), to strengthen capacity to *implement the Convention on Biological Diversity in four pilot countries* (Mozambique, Tanzania, Uganda and Rwanda). New bilateral co-operation programmes were launched between the end of 2004 and mid-2005 to promote sustainable development through *agro-forestry* and social infrastructure in the buffer zones of key protected areas in Ecuador and Peru (EUR 7.5 million over five years and EUR 2.5 million over four years, respectively).

Notes

1. Nature areas refer to a land-use category in Flemish spatial planning (other categories include industrial areas, agricultural areas, woodland areas, reserve areas, recreation areas, park areas and buffer areas).
2. 75% of barriers to fish migration should be removed by 2007 (MINA-Plan) and 100% by 2010 (Benelux commitment).
3. In Flanders, NO_x and NH_3 deposition decreased from 3 463 acid equivalents in 1990 to 3 160 in 2002.
4. The 2010 target for NO_x set by the EU's 2001 National Emission Ceiling Directive will not likely be met, although the target for NH_3 probably will be (Chapter 2).
5. Since January 2006, EU financial assistance (LIFE-Nature) has helped eradicate the black cherry on military sites.
6. COM(1998)42, Communication from the Commission to the Council and to the European Parliament on a European Community Biodiversity Strategy.
7. Following regionalisation of agricultural policy since 2002.
8. AEMs in Belgium include primarily contracts signed since 2000 under Regulation (EC) 1257/99 and, to a small extent, commitments under the former Regulation (EC) 2078/92. Organic farming is part of the AEMs.
9. In Belgium this includes mainly organic meat products, plus some fruits and potatoes. Belgium has very few farms with mixed production, and 86% of organic farming is in Wallonia, where extensive cattle farming predominates, in contrast to the intensive livestock husbandry in Flanders.
10. In the context of the EU Common Agricultural Policy reform, under EC Regulations (EC) 2080/92 and (EC) 1257/1999.
11. Nearly a quarter of the Belgian territory (i.e. 682 000 ha) is covered by forests.
12. Approximately half of the Walloon forest area is privately owned, mainly by small owners (2.5 ha on average), which makes overall management more complex.
13. Accounting for 1.5% of the Flemish private forest area.
14. In 2004 Belgium ratified the Cartagena Protocol under the Convention on Biological Diversity.
15. Areas suitable for production of wind energy and areas to be used for sand and gravel extraction have recently been delineated.

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4

ENVIRONMENTAL-ECONOMIC INTERFACE*

Features

- Pollution, energy and resource intensities
- The Belgian sustainable development institutional model
- Environmentally related taxes
- Climate change: institutions and co-operation
- The Belgian environmental federalism
- Streamlining and enforcement of environmental regulations
- Use of economic instruments
- Manure management in Flanders
- Pollution abatement and control expenditure

* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental. Performance Review of 1998. It also reviews progress with respect to the objectives of the 2001 OECD Environmental Strategy. It takes into account the latest Economic Surveys of Belgium.

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the environmental performance review of Belgium:

Integration of environmental and economic decisions

- establish a *green tax commission* and review, and if necessary revise, the relevant taxes and other economic instruments to improve their effectiveness and economic efficiency; review systematically the environmental effectiveness and economic efficiency of the country's financial assistance schemes;
- further implement the federal plan for *sustainable development* (2004-08); develop and implement a national strategy for sustainable development, in line with UN commitments;
- set *quantitative targets* for the environment in relevant planning (e.g. economic and sectoral); make further use of economic analysis for setting environmental and sustainable development priorities;
- further *integrate environmental concerns into sectoral policies* (e.g. energy, transport, agriculture) through strategic environmental assessment and development of market-based mechanisms; further implement policy and measures to improve *energy efficiency*;
- strengthen *institutional co-operation* between departments and between federal and regional governments, in particular as regards the environment-energy interface;
- conduct a *comprehensive review of climate* mitigation measures beyond the EU emission trading scheme.

Implementation of environmental policies

- increase the use of *economic instruments* (e.g. taxes, charges, trading mechanisms) and *economic analysis* (e.g. cost-benefit analysis);
- strengthen the review by regional authorities of municipal *land-use plans* to increase their effectiveness in addressing environmental objectives; strengthen *co-operation among regions* in land-use planning and environmental impact assessment;
- strengthen environmental *inspectorates*; increase their effectiveness and efficiency, where appropriate;
- review the experience with *partnerships* between government and non-governmental organisations (e.g. industry, trade unions, environmental NGOs) to see how such partnerships can be made more ambitious, cost-effective and transparent and how they can be associated with other instruments.

Conclusions

Integration of environmental concerns into economic decisions

Belgium made progress over the review period in *decoupling* environmental pressures from economic growth for some conventional pollutants (e.g. SO_x and NO_x emissions) and for water abstractions. Growth in household waste for final disposal was also decoupled from economic growth due to high rates of recycling. *Sustainable development institutions* were developed at the federal level (Sustainable Development Law, establishment of a governmental committee and of a council for sustainable development, creation of a Secretary of State position for sustainable development). Two federal plans were adopted along the three pillars of sustainable development, together with evaluation and consultation procedures. Principles of sustainable development were also embodied in the regional environmental plans. The regional governments made some progress in *integrating environmental concerns into agriculture* (by augmenting support for agri-environmental measures). *Climate change policy* is moving ahead with the regional climate change plans and national burden-sharing agreement, and through a range of domestic measures, participation in the EU emission trading scheme and the Kyoto Protocol flexibility mechanisms.

However, there is still a need to decouple *road freight transport* from economic growth, as the increase in road freight transport is of high concern. *Energy intensity* (total primary energy supply per unit of GDP) is still considerably higher than in neighbouring countries. Integration of environmental concerns into energy policy is lagging. Energy prices should internalise environmental external costs. *Pressures on water and soil resources* (from water abstractions, nitrate and pesticides) are *among the highest in the OECD*. The targets to expand *organic agriculture* have not been met. A number of tax concessions lead to perverse effects on the environment. No action has started on a *green tax reform* as recommended in the last OECD environmental performance review. The effectiveness and economic efficiency of the country's subsidy schemes for rewarding environmental behaviour may need to be reviewed. Quantitative targets are needed and cost-benefit analysis should be used more systematically for setting priorities.

Implementation of environmental policies

After periods of uncertainty and of major environmental reforms associated with the process of federalisation of the country, Belgium's federal and regional authorities were able, during the review period, to build on: i) *stable environmental institutions* with a clear division of responsibilities and mechanisms for co-operation, ii) *EU environmental legislation* as well as the country's international commitments, and

iii) *co-operation and partnership* with industry, trade unions and environmental NGOs. Total expenditure on pollution abatement and control grew significantly, reaching about *1.7% of GDP*. Nature protection also progressed, with the extension of protected areas in the context of the Natura 2000 network, despite the very high densities of population, activities and infrastructure of the country. Well established regional environmental administrations now all have *planning cycles*, indicators of progress and policy review mechanisms, and all have implemented *advanced environmental policies*. Federal authorities have exercised their responsibilities (e.g. ecotaxes, product standards, trade matters, international matters, radiation protection and protection of the marine environment). Better environmental management was achieved through a *mix of policy instruments*, including economic instruments, information campaigns, agreements (between the regions, provinces and municipalities), regulations (which were codified or streamlined) and voluntary actions (taken by industry). *Inspection authorities* improved their effectiveness and efficiency. Progress with single permitting and the use of environmental impact assessment was noteworthy. All these efforts have contributed to *partly repay the country's outstanding environmental debt*.

However, a number of indicators show that the results are not sufficient. Energy use, material use and pollutant emission *intensities* (i.e. per unit of GDP) remain relatively high. Indicators of *densities* of environmental pressures (i.e. per km^2) are also very high. Addressing this will require Belgium to strengthen and/or extend its environmental efforts and to make them more cost-effective by increasing the use of *economic instruments* (e.g. taxes, charges, emission trading mechanisms) and *economic analysis* (e.g. cost-benefit analysis), notably for air, water and waste management. Belgium has still not fully implemented all EU environmental directives. The mix of policies covering waste management could often be more efficient. *Voluntary approaches* could often be more ambitious. *Land-use legislation*, *planning* and *policy*, which formally address environmental concerns, need to do so more widely in practice, to better control urban sprawl and the loss of green spaces.

♦ ♦ ♦

1. Decoupling Environmental Pressures from Economic Growth

Overall, the very open and service-oriented *economy of Belgium grew* by 13% during the period 1998-2004, while its population increased by 2% (Box 4.1). Industrial production increased by 11%, road freight traffic by 27%, passenger car traffic volume by 8%, and agricultural production by 5%, while total primary energy supply decreased by 1% (Table 4.1).

Box 4.1 **Economic context**

The Belgian economy is *one of the most open in the OECD*, with overall exports and imports of goods and services constituting more than 80% of GDP (of which one-half are with its neighbours Germany, France and the Netherlands). GDP was EUR 298.2 billion in 2005. At USD 27 361 (2000 prices and purchasing power parities), the per capita GDP is well above the OECD-Europe average (Figure 4.1). *Services* (mainly real estate, rents and services to companies, wholesale and retail trade) contribute nearly 75% to the Gross Value Added; manufacturing (chemicals, metal industry) contributes just 18%.

Between 1998 and 2004, Belgian's economy grew by 13%. Belgium is the world's *tenth largest exporter of merchandise*. Exports of goods are dominated by machinery and transport equipment (more than 90% of the cars made in Belgium are exported), other manufactured goods (e.g. gemstones) and chemicals. Exports of services (e.g. information technology, engineering, financial services) are also significant; Belgium is the *eleventh largest exporter of services* in the world. The balance-of-payment surplus decreased from 5.2% of GDP in 1998 to 3.3% in 2004. General government total outlays amounted to 48.7% of GDP; this figure includes 4.6% of GDP in interest payments on a gross general government debt of 94.5% of GDP (Maastricht definition, almost all of which is central government debt). Since the mid-1990s, Belgium has achieved *important progress in reducing annual budget deficits and public debt*.

1.1 Pollution intensities

Over the review period, *SO_x and NO_x emissions were strongly decoupled* from economic growth, decreasing respectively by 27% and 16%. For SO_x, progress can be attributed to: i) a shift by industry from coal to natural gas, ii) disinvestments in the iron and metallurgic industry, iii) the closure of some plants, and iv) process and end-of-pipe measures in industry and energy production. CO_2 emissions did not increase, although GDP grew significantly.

Belgium's *SO_x and NO_x emissions* per unit of GDP are both lower than the OECD-Europe average (Figure 2.2). However, SO_x emission intensity is about twice as high as in France, Germany and the Netherlands, and NO_x emission intensity is somewhat higher. *CO_2 emissions* per unit of GDP in Belgium are higher than the OECD-Europe average and similar to rates in Germany and the Netherlands.

Table 4.1 **Economic trends and environmental pressures**

(%)

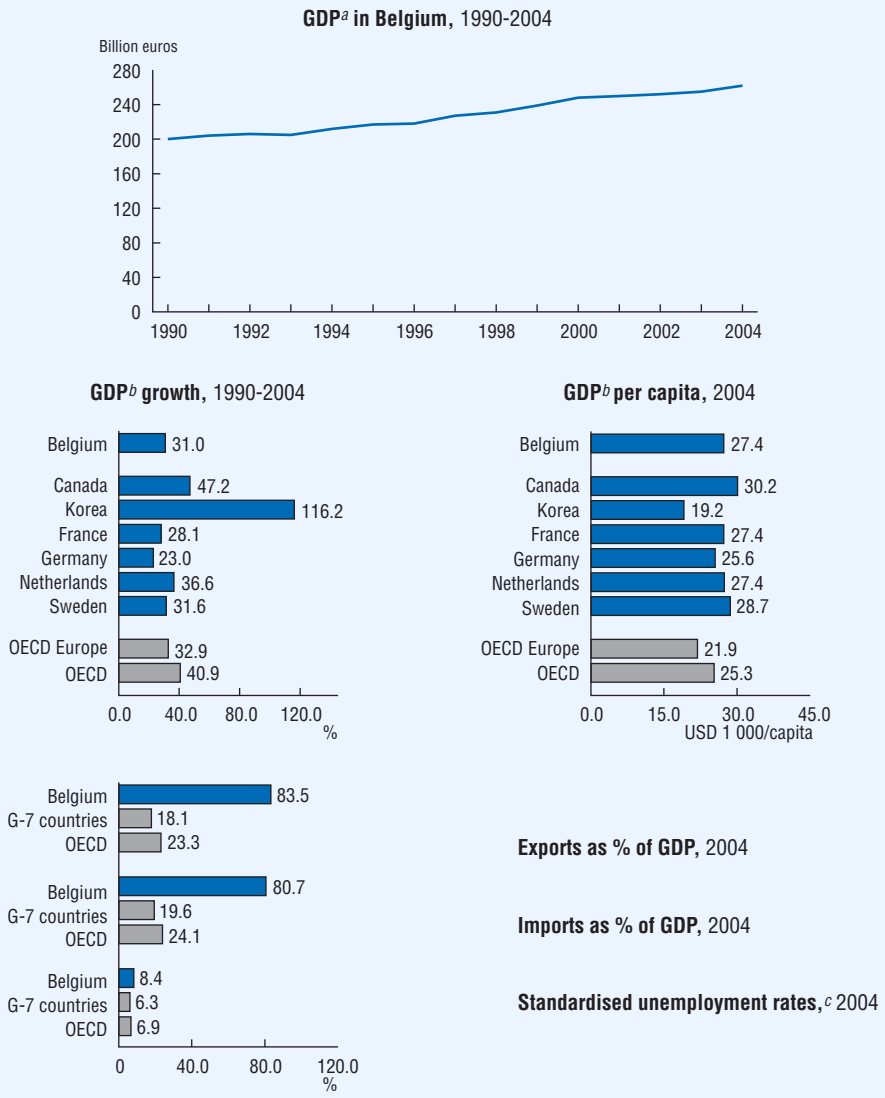
	1990-2004	1998-2004
Selected economic trends		
GDP[a]	31	13
Population	4	2
GDP[a]/capita	26	11
Agricultural production	20	5
Industrial production[b]	21	11
Road freight traffic[c]	73[d]	27[d]
Passenger car traffic volume[e]	31[d]	8[d]
Selected environmental pressures		
Pollution intensities		
CO_2 emissions from energy use[f]	7	–4
SO_x emissions	–58	–27
NO_x emissions	–24	–16
Energy intensities		
Total primary energy supply	17	–1
Total final consumption of energy	24	0
Resource intensities		
Water abstraction	. .	–10[g]
Nitrogenous fertiliser use	–12[g]	–4[g]
Pesticide use	–11[g]	–7[g]
Municipal waste generation	42	–4

a) At 2000 prices and purchasing power parities.
b) Includes mining, quarryi.ng and manufacturing.
c) Based on values expressed in tonne-kilometres.
d) To 2003.
e) Based on values expressed in vehicle-kilometres.
f) Sectoral approach; excluding marine and aviation bunkers.
g) To 2002.
Source: IEA-OECD; OECD Environment Directorate.

1.2 Energy intensity and energy efficiencies

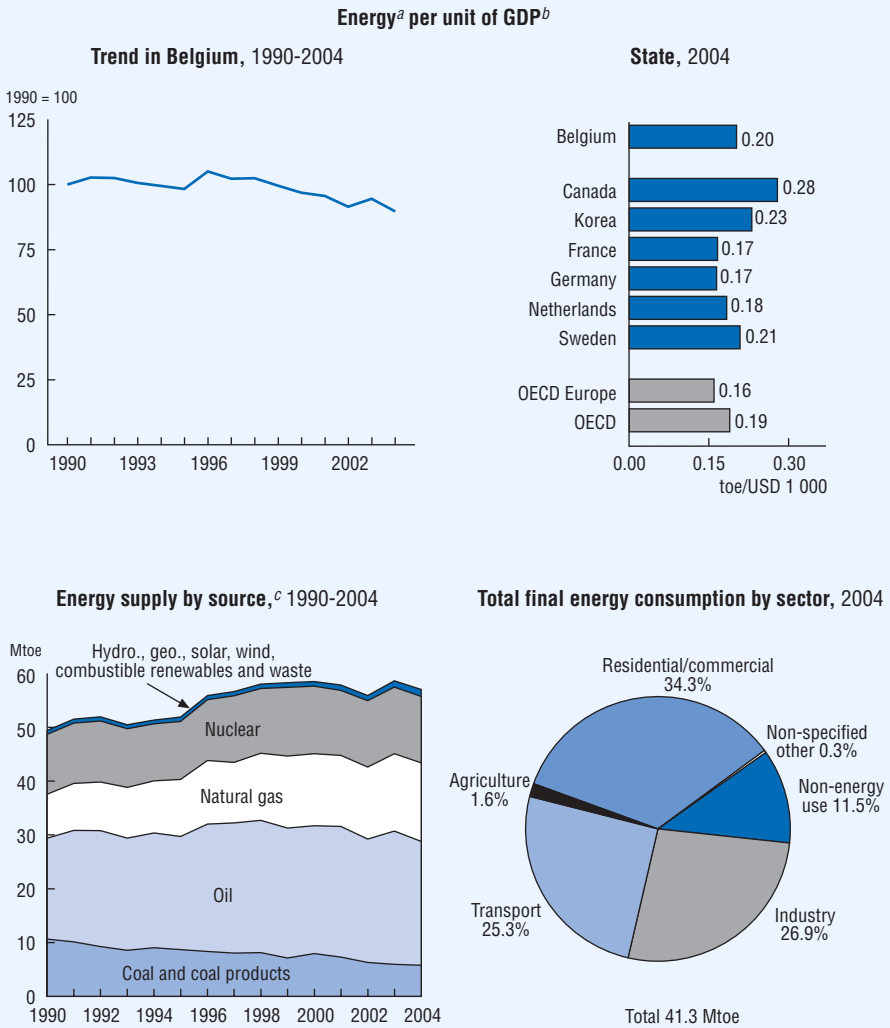
Energy intensity decreased by 8% over the review period reaching 0.20 toe per USD 1 000 of GDP (Figure 4.2). However, energy intensity has been falling at a slower rate than in other nearby countries, and Belgium is still above the OECD-Europe average (0.16). This is due partly to a *very energy-intensive industrial sector*

Figure 4.1 **Economic structure and trends**



a) GDP at 2000 prices.
b) GDP at 2000 prices and purchasing power parities.
c) % of civilian labour force.
Source: OECD (2005), OECD Economic Outlook No. 77.

Figure 4.2 **Energy structure and intensity**



a) Total primary energy supply.
b) GDP at 2000 prices and purchasing power parities.
c) Breakdown excludes electricity trade.
Source: OECD-IEA (2006), Energy Balances of OECD Countries 2003-2004; OECD (2005), OECD Economic Outlook No. 77.

with a large share of manufacturing and production of iron, steel, cement, chemicals and sugar. Another cause is a long-neglected energy demand policy. Furthermore, Belgian buildings have historically had relatively poor energy performance, due in part to low compliance with building codes.

1.3 Resource intensities

Water withdrawals dropped by 10% during the review period, largely through a reduction in withdrawals for cooling purposes in industry and electricity generation.

The *use of nitrogenous fertilisers* decreased slightly (by 4%) between 1998 and 2002 and continues to decline in Wallonia and Flanders. However, because of intensive agriculture in Flanders, the consumption of nitrogenous fertiliser in Belgium has reached 10.8 tonnes/km^2 of agricultural land, a high rate among OECD countries. Together with nitrates from animal production, this leads to major environmental concerns (eutrophication, groundwater pollution, North Sea pollution).

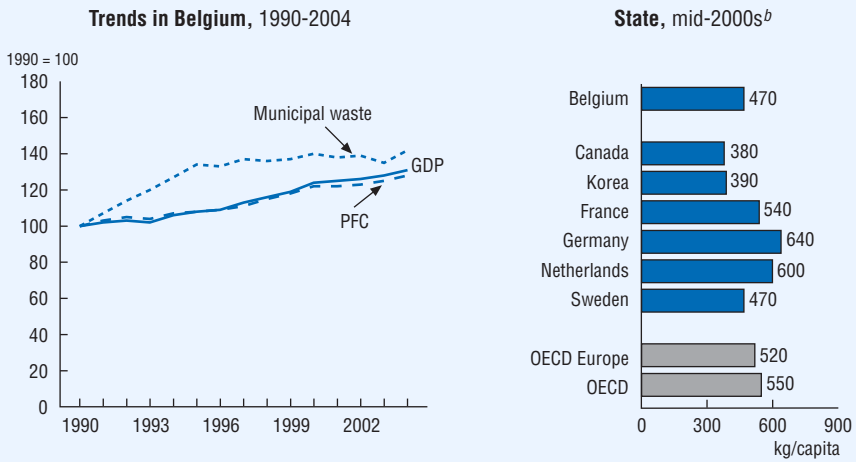
The *use of pesticides* in Belgium as a whole reached 0.69 tonnes/km^2 of agricultural land, a very high rate among OECD countries (Figure 2.6). In Wallonia, total quantities of herbicides and insecticides (active substances) applied decreased by 18% and about 30%, respectively, between 1995 and 2003, while fungicide use tended to increase. In Flanders, total quantities of herbicides, insecticides and fungicides applied decreased by about 16% between 1995 and 2004.

Municipal waste for final disposal increased by 4% between 1998 and 2004, whereas GDP increased by 13% over the same period (Figure 4.3). Belgium has achieved very high recycling rates for household waste in a relatively short period, surpassing its targets under EU directives.

1.4 Assessment

Good progress was made during the review period in *decoupling* SO_x emissions, NO_x emissions and water abstractions *from economic growth*. However, Belgium has relatively high SO_x emissions, CO_2 emissions and energy use per unit of GDP compared to other OECD countries. It has the highest or close to the highest intensities of nitrogenous fertiliser use and pesticide use. Municipal waste has not increased as rapidly as economic growth, which can be considered a remarkable achievement. Belgium should reinforce its efforts to further reduce pollution, energy and resource intensities.

Figure 4.3 **Municipal waste generation**[a]



a) In interpreting national figures, it should be borne in mind that survey methods and definitions of municipal waste may vary from one country to another. According to the definition used by the OECD, municipal waste is waste collected by or for municipalities and includes household, bulky and commercial waste and similar waste handled at the same facilities.
b) Or latest available year.
Source: OECD Environment Directorate.

2. Sustainable Development and Institutional Integration

2.1 Sustainable development at the federal level

Institutions

Sustainable development has been high on the policy agenda in Belgium since May 1997, when the *federal parliament* adopted the law on co-ordination of the sustainable development policy. It became a central political concept with the 2003 federal *government declaration*. An Interdepartmental Commission on Sustainable Development (ICSD) has been established under the responsibility of the member of the federal government responsible for sustainable development. A Secretary of State has been nominated to that effect. An advisory council has also been established, the Federal Council on Sustainable Development (FCSD), which includes representatives of civil society.[1]

Constitution

After its adoption by the Senate in July 2006, the House of Representatives is currently examining the introduction of a *new Article 7bis* within the Constitution stating that the federal state, the regions and the communities, within their respective competencies, are to be guided by the objectives of sustainable development in its three dimensions, taking into account the solidarity between the generations.

Planning

Every four years a *federal plan on sustainable development* is prepared by the ICSD (with the support of the Federal Planning Bureau). Following a procedure of public and FCSD consultation of a preliminary draft, a draft plan is submitted to the Council of Ministers for approval. The plan is then published by royal decree. During the review period, two such plans were adopted, the first in 2000 covering 2000-04, the second in 2004 covering 2004-08. Sustainable development policies are assessed regularly by the Task Force on Sustainable Development of the Federal Planning Bureau. Annual reports are prepared by the ICSD on the state of implementation by various administrations of the different measures contained in the federal plan. In light of these reports, the FCSD makes *policy recommendations*.[2]

During 2004, sustainable development units were created in the *17 federal public services (FPS) and federal public planning services (PPS)* to promote implementation of the federal plans for sustainable development. These units have the status of a working group attached to the Chairman of the Board of Directors of each FPS/PPS.

So far, the *Task Force on Sustainable Development* of the Federal Planning Bureau has published three reports (in 1999, 2002 and 2005) and the FCSD has published 119 advisory notices. An evaluation of the first plan showed that of the 622 measures identified in the plan, 56% had been followed up (mainly concerning energy, transport, ozone and climate), 12% had had no follow-up, and no information was available for the remaining 32% (Delbaere *et al.*, 2005).

Because the first plan for sustainable development, for 2000-04, contained a very high number of policy measures, the ICSD decided that the plan for 2004-08 should focus on specific areas. The Commission agreed that the *six priority areas* of the 2001 European Strategy for Sustainable Development (combating poverty and social exclusion, dealing with the implications of an ageing society, addressing threats to public health, managing natural resources more responsibly, limiting climate change and increasing the use of clean energy, improving the transport system) would be the *basis for designing approximately 30 actions, with 5 actions per theme*. The final version of the plan contained 31 actions and about 380 policy measures as well as a section on implementation. Quantitative objectives were however lacking.

Progress has also been made in preparing a *Belgian national strategy for sustainable development* by the federal government, regions and communities, with input from local authorities and stakeholders. A common framework is being negotiated with the aim of having a national strategy adopted in 2006. Such a national strategy would respond to UN commitments.

Assessment

Belgium is to be congratulated for having put in place *institutional structures and planning tools to promote sustainable development*, with a well-defined policy cycle (the four-year federal plans for sustainable development, biannual assessment by the Federal Planning Bureau, annual reports by the ICSD, and public input through the FCSD). The participatory mechanisms help to strengthen the country's social cohesion and social capital. It has addressed sustainable development issues at government level. Belgium has rooted its sustainable development efforts in the international sustainable development movement, and has been a *leading country* in promoting sustainable development at EU and world levels.

However, the evaluation process focuses on procedures rather than on outcomes. The plans for sustainable development lack quantitative objectives. A clearer methodology should be developed to ensure that choices made between different goals are not based purely on budgetary considerations, but on maximisation of net benefits. The June 2005 Court's audit report on the co-ordination of the federal policy of sustainable development also signals the discrepancy between government commitments and delivery and suggests adoption of a longer term (10- to 30-year) perspective. As in other countries, translating the concept of *sustainable development into practice* in Belgium will depend upon institutional integration and market-based integration.

Strategic environmental assessment

A *federal law of 13 February 2006* implements EU Directive 01/42/EC on the assessment of the effects of certain plans and programmes on the environment and EU Directive 03/35 providing for public participation with respect to the drawing up of such plans and programmes. Strategic environmental assessment (SEA) will be carried out on a range of federal plans and programmes that are likely to have significant effects on the environment. This includes electricity production and supply, natural gas supply, development of the electricity distribution network, and long-term management of radioactive waste, as well as development and exploration on the continental shelf and any plans and programmes that would affect marine areas protected under the Birds and Habitats Directives (Special Areas of Conservation and Special Protection Areas). An administrative advisory committee has been created to advise the federal government on the scoping and screening parts of the SEA procedure. Public participation will be ensured.

2.2 Planning and sustainable development at the regional level

Environmental and sustainable development planning in Flanders

Flanders is required to prepare an *environmental policy plan* (MINA plan) every five years, an *environmental report* (MIRA) every two years and an *environmental programme* every year. The present review covers two environmental policy plans (the MINA-plan 2 and MINA-plan 3).

The current *Flemish Environmental Policy Plan* (the MINA-plan 3) for the period 2003-07 contains both long-term strategic objectives (between 2015 and 2030) and plan objectives (in principle 2007) (Flemish Government, 2003). It covers 12 environmental themes (ozone layer, climate, photochemical substances, acidification, eutrophication, dangerous substances, soil pollution, wastes, water, nuisances, fragmentation and loss of biodiversity). The 12 themes are supplemented by transversal approaches: the territorial approach, the involvement of the various actors, the need for an integrated policy and an international policy, the instruments and the necessary budgetary tools to implement the plan. Most of the plan's approximately 100 objectives are quantified (e.g. reduce the emission of ozone-depleting substances by 70% compared with 1999; stabilise the emissions of greenhouse gases in 2005 compared with 1990; reduce the total amount of household waste to 150 kg per resident; increase the share of household waste water actually treated to 80%; reduce the use of potable water to 98 l/resident/day). These will be monitored using indicators included in the plan. While objectives are fixed for the plan period, the remaining provisions are indicative, making it possible to adjust the measures and projects used to realise the objectives during the plan period. As a result, the role of the annual environmental programmes is becoming more prominent. The need to develop a co-ordinated policy towards target groups has been recognised and a pilot project with the food industry has been launched.

Although the Flemish Environmental Policy Plan is *not a sustainable development plan*, it takes into account the basic concepts of sustainable development: a long-term vision, a vertically and horizontally integrated policy, stakeholder participation (including public consultation), and an international approach. As such, it constitutes an important contribution to the sustainable development policy of Flanders. Elaboration of the *Flemish Strategy for Sustainable Development* based on the environment, social and economic pillars started in April 2005. Adopted in July 2006, the strategy includes the following themes: combating poverty and social exclusion, ageing population, climate change, mobility, spatial planning, sustainable management of natural resources, preventing health risks and governance.

To stimulate *environmentally sustainable local actions and policies*, the Flemish Government has developed voluntary co-operation agreements with local authorities. Under these agreements, provinces or municipalities receive a subsidy depending upon the level of ambition of their plans. So far, five Flemish provinces and 250 municipalities (78% of all cities) have signed an agreement.[3]

Sustainable development planning in Wallonia

Sustainable development principles were introduced in Wallonia with the "*Contract for the Future*" *for Wallonia*, elaborated with citizen participation and adopted in 2000. The goal of this contract was to set priorities and determine long-term objectives. However, according to the Walloon environmental and sustainable development council, the contract was characterised by a social focus and lacked quantified objectives, clear time tables or priorities.

The *updated (2002) version of the contract* (the "Contrat d'avenir pour la Wallonie actualisé") drew on lessons from the first version and set quantitative objectives (Walloon Government, 2002). It covered: enterprises, training, research and development, internet, agriculture and biodiversity, sewerage, renewable energy, wastes, mobility, road safety, habitat, security, environmental management systems and quality, social insertion and equality of opportunity, employment, life-style choices and social links, structural reforms, citizen involvement and partnerships.

In 2005, the Walloon government adopted a renewed *contract for the future* ("Contrat d'avenir renouvelé") through its Regional Policy Declaration ("Déclaration de politique régionale") 2004-09 (Walloon Government, 2005). This contract defines six objectives as the starting point for the regional sustainable development plan: i) to increase the creation of wealth and the rate of employment; ii) to develop knowledge in a continuous way; iii) to advance social cohesion and place value on the social capital of Wallonia; iv) to seek a continuous improvement of the way of life; v) to ensure a balanced territorial development; and vi) to ensure equality between women and men living in Wallonia whatever their origin. The contract also sets quantified objectives for the three domains (economic, social and environmental) of sustainable development policy.

An internal and external *assessment system* has been foreseen to check the degree of implementation of these contracts, but no independent reporting system has been put in place yet. A broad evaluation is carried out within the contract itself as an introduction to the objectives and measures to be implemented.

In addition, the Walloon government has decided to "*green*" *its own operations*, which will be certified according to the EU EMAS Regulation. The central environmental services are already EMAS-registered, and all its bodies involved in environmental work in the Walloon Region are expected to be registered.

Planning in the Brussels-Capital Region

In Brussels-Capital, the *second regional development plan*, elaborated in 2002, focuses on a number of priority themes: urban environment; sectors of the economy; housing; habitat; land-use planning; commercial, cultural and tourist attractiveness; social needs; mobility; management of resources; intercultural, international and European character of Brussels; safety and science policy. Although the plan is not a sustainable development plan, sustainable development is seen as an opportunity to create new firms and new jobs.

The *Contract for the Economy and the Employment for Brussels 2005-10* identifies the environmental sector as one that can bring triple dividends to the region: social dividends through the creation of jobs in areas where needs are not satisfied, environmental dividends through the reduction in energy and raw material consumption, and economic dividends through the emergence of a new sector of activity (Brussels-Capital Region, 2005). So far, jobs related to the environment in the Brussels Region are estimated at 0.7% to 1.3% of total employment. Several plans integrate the environmental dimension of a sustainable development policy: the Regional Development Plan II; the Iris Plan (mobility); the Waste Plan III; the Noise Plan II; the Air-Climate Plan; the green and blue network (aiming at creating and managing public green space, biodiversity and surface waters) (Box 3.2).

2.3 Communities

The three other components of the Belgian Federation, namely the three communities, are associated with a number of sustainable development actions, which depend partly on their authorities. These include actions related to *education*. Community authorities, like federal and regional authorities, have their own co-ordinating structures to implement *Local Agenda 21*.

3. Sustainable Development and Market-based Integration

The 2001 reform of the federal system in Belgium considerably *expanded the fiscal autonomy of the country's regions*. Applying the OECD typology to this new system, the proportion of tax revenue over which Belgian regions enjoy full autonomy is now 40% as compared to 8% previously. Some regions have used their increased autonomy. No change has yet occurred in the personal income tax or the taxation of vehicles (OECD, 2004). A modification of vehicle taxation would require a prior co-operation agreement between the three regions. Environmentally related taxes primarily concern the energy and the transport sectors.

3.1 Energy taxes

The *federal government* collects the main taxes on *energy and fuels*; these include excise duties on energy products, an inspection fee on domestic fuel oil and a levy on energy (both of the latter are now integrated into excise duties) (Tables 4.2, 4.3). In 1993, a special levy on domestic energy products was applied to gasoline, light heating oil, natural gas, liquefied petroleum gas and electricity; coal, social tariffs for electricity, and gas and diesel fuel were exempted. In practice, households have long been the primary contributors of the energy levy, while industry has been exempt (with the exception of its use of light heating oil). In 2003, the energy levy was extended to industry and diesel fuel ceased to be exempt.

Concerning the *value added tax* (VAT), electricity and natural gas for households have been subject to a 21% VAT rate since 1996. Gasoline is also subject to the general rate of 21%. There are no taxes on coking coal or steam coal for industry and electricity generation. A reduced rate of 12% applies to steam coal for households. In October 2005, the federal government introduced a set of measures to cushion the impact of rising oil prices on households. Between June and December 2005, whenever the price of heating oil exceeded the threshold of 0.5 EUR/litre, the government would compensate customers for a maximum amount equal to the 17.35% VAT of the household bills. Households have received EUR 100 on average. A similar measure was developed for natural gas in 2006.

Since 1993, an excise tax has been charged on *heavy fuel oil for industry* and electricity generation; the tax is differentiated according to the *sulphur content* of the fuels. In 1996, additional excise taxes were placed on road fuels. A ratchet system for excise duties on road fuels (both diesel and gasoline) was introduced in 2003: up to a certain limit, half of the yearly price drop could be offset by an increase in excise duties until 2007. However, because of the rise of oil prices, a reverse ratchet system was put in place in July 2005 and the old ratchet system was ceased two months later. Taxes on unleaded gasoline are higher than those on diesel fuel. Overall, *taxes on road fuels* in Belgium are comparable to those of neighbouring countries for gasoline and lower for diesel fuel (Figure 4.4).

In 2003, two *federal levies* came into force, one for electricity and another on natural gas, to finance certain public service obligations. Part of the federal levy on electricity is used to finance measures aimed at reducing greenhouse gas emissions through the Kyoto fund. Similarly, *regional levies* on electricity and natural gas suppliers are used in Brussels-Capital to finance the region's "Rational Use of Energy" subsidy scheme.

Table 4.2 **Environmentally related taxes**[a]

Tax	Tax rate	Comments
ENERGY		
Excise tax on road fuels		
Diesel	0.326 EUR/litre	
Unleaded petrol[b]	0.564 EUR/litre	
Excise tax on other mineral oils		
Light fuel oil	21 EUR/tonne	Rate is identical for households and for industry
Heavy fuel oil	15 EUR/tonne	Low sulphur fuel oil
LPG	–	
Methane	–	
Kerosene as fuel	0.5518 EUR/tonne	
Coal	0.0087 EUR/kg	
Energy levy		Applies to households
Unleaded petrol	0.0286 EUR/litre	
Diesel	0.0149 EUR/litre	
Kerosene as fuel	0.0286 EUR/litre	
Kerosene for heating[c]	0.0179 EUR/litre	
Light fuel oil[c]	0.0084 EUR/litre	+0.01 EUR/litre inspection fee[c]
Electricity[c]	1.9088 EUR/MWh	
Natural gas[c]	1.1589 EUR/MJ	
Butane[c]	17.1047 EUR/tonne	
Propane[c]	17.3525 EUR/tonne	
TRANSPORT		
Vehicle registration tax	EUR 61.50 to EUR 4 957	Increases with engine size
Annual motor vehicle tax	Cars/minibuses: EUR 58.44 to EUR 1 494.72/year	Increases with engine size
	Lorries: EUR 59 to EUR 552.11/year	Increases with weight
	Buses: EUR 51.713 to EUR 360.1309/year	Increases with engine size
	Tows: EUR 27.36 to EUR 56.76/year	Increases with weight
	Tractors: EUR 59.97 to EUR 808.01/year	Increases with weight
Supplementary annual motor vehicle tax	Cars/minibuses: EUR 89.16 to EUR 208.20/year	Applies to LPG vehicles; increases with engine size
Excise compensation tax	Cars/minibuses: EUR 40 to EUR 1 187.16/year	Applies to diesel vehicles; increases with engine size
Eurovignette[d]	Maximum 3 axles: EUR 850 to EUR 960/year Minimum 4 axles: EUR 1 400 to EUR 1 550/year	Lower rates for more stringent emission standards (EURO)

a) Rates as of January 2006.
b) 95 RON.
c) Companies having entered into a voluntary agreement or taking part in an emissions trading scheme may apply for tax concessions.
d) Pursuant to EU Directive 99/62/EC which applies to EU member states that do not levy tolls for the use of motorways (Belgium, Denmark, Luxembourg, the Netherlands and Sweden).
Source: FPS Finance.

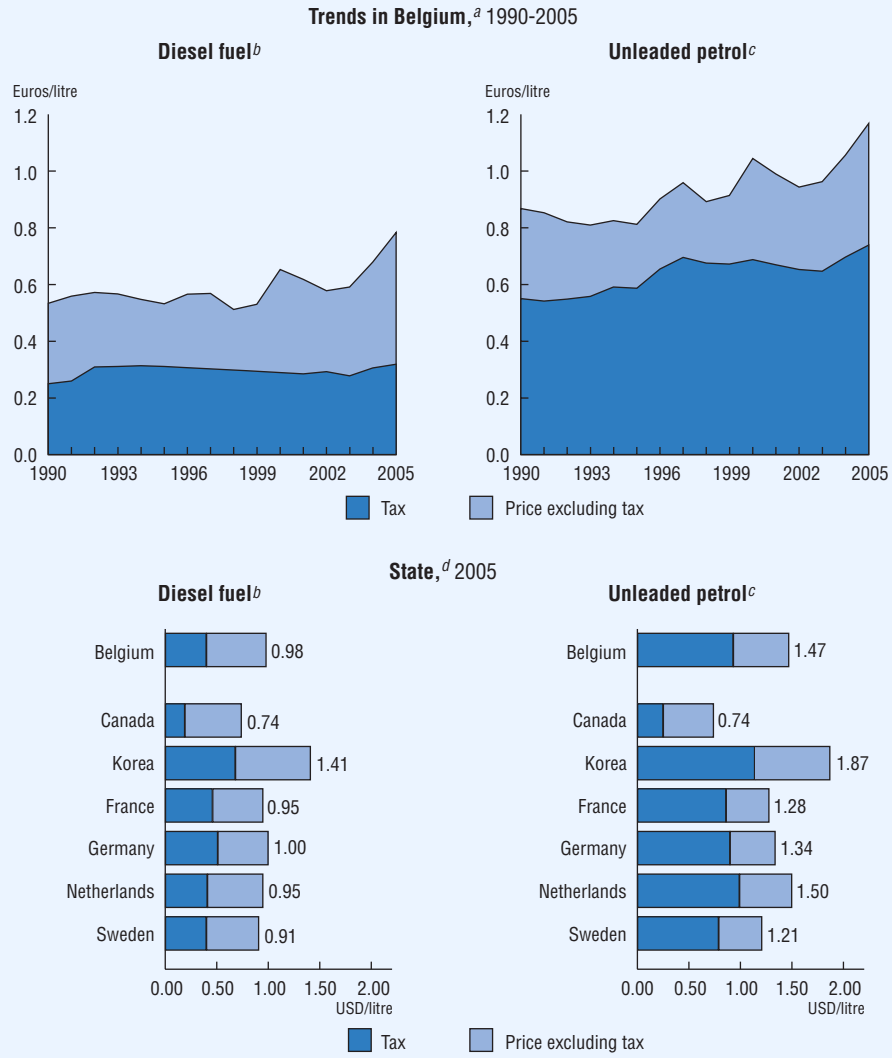
Table 4.3 **Revenues from environmentally related taxes,** 1994-2003

('000 000 EUR)

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Excise duty on mineral oils	2 860	2 920	3 102	3 239	3 337	3 360	3 392	3 396	3 444	3 519
Inspection fee on light fuel oil	37	35	40	36	37	34	29	35	29	30
Energy tax on households	215	203	219	216	207	205	193	201	192	264
Annual motor vehicle tax (households)	564	589	653	702	677	813	756	776	796	849
Annual motor vehicle tax (industry)	318	307	327	344	323	388	376	381	392	417
Registration tax	189	184	212	195	214	235	209	268	252	248
Levy on car insurance premiums	416	417	440	430	423	427	446	464	476	500
Tax (excise) paid by households	0	0	121	131	137	144	133	163	167	175
Tax (excise) paid by companies	0	0	60	66	69	72	66	81	83	88
Contribution from electricity corporations	0	0	0	37	37	0	0	0	0	0
Contribution from the oil sector	0	0	0	0	0	0	0	0	0	21
Taxes on poster advertising	1	1	1	1	1	1	1	1	1	2
Eurovignette	0	84	78	84	88	82	82	90	112	81
Ecotaxes	–	–	–	–	–	3	2	2	–	1
Taxes on water	195	208	301	368	379	376	363	327	336	361
Regional tax (BR)	43	44	62	71	68	61	94	89	63	69
Tax on industrial waste products (FR and WR) landfill, incineration	81	90	104	122	92	100	74	72	69	75
Taxes on water (FR, WR and BR)	8	8	9	15	15	19	15	29	27	23
Tax on household waste (RW)	19	22	32	17	24	25	20	31	15	12
Tax on manure (FR)	4	4	1	9	5	2	11	5	5	4
Flat-rate regional tax (BR)	0	0	0	0	0	0	0	0	65	62
Non-earmarked municipal taxes related to environment[a]	276[b]	287	306	310	331	357	361[b]	361[b]	361[b]	361[b]
Total	5 226	5 401	6 070	6 394	6 465	6 703	6 623	6 772	6 886	7 162

a) NSI estimates based on local administration budgets, excluding energy and vehicle taxes, which are included above.
b) Rough estimates in order to be able to estimate a total.
Source: INA (Belgostat), calculations NSI; OECD database on environmentally related taxes.

Figure 4.4 **Road fuel prices and taxes**



a) At constant 2000 prices.
b) Automotive diesel for commercial use; Korea: for non commercial use.
c) Unleaded premium (RON 95); Canada, Korea: unleaded regular.
d) In USD at current prices and purchasing power parities.
Source: IEA-OECD (2006), database of end-use prices.

3.2 Transport taxes

Since 2002, vehicle taxation (registration tax, annual motor vehicle tax, Eurovignette) has been the responsibility of the regions, though the federal government continues to collect the taxes (Chapter 2). The *registration tax* is based on engine capacity in horse power (HP), on power in kW, on vehicle age, and/or on the amount of pollutant emissions. The *annual motor vehicle tax* is based on engine capacity in HP. A supplementary annual motor vehicle tax has been introduced for liquified petroleum gas (LPG) vehicles, taking account of i) the absence of excise duties on LPG and ii) the reduced registration tax on LPG vehicles. The charge for the delivery of licence plates (at purchase) was replaced in 2005 by an increase of excise taxes. Also, an *excise compensation tax for diesel vehicles*, based on engine capacity in HP, was introduced to compensate (to some extent) for the lower excise duties on diesel fuel, though it is scheduled to be phased out. Such (limited) shift from vehicle taxation to road fuel taxation (and implicitly to taxation based on kilometres driven) is welcome, as road fuel taxation is more targeted on the external effects of driving rather than on ownership. In Flanders, a guide to CO_2-friendly cars was launched in January 2006 and work is under way on a vehicle eco-score system (and related taxation), which would take account of a range air pollutant emissions (including but not only CO_2). The "*solidarity contribution fee*", which is of federal responsibility and applies to the private use of company cars, has been made dependent on CO_2 emissions.[4]

Wallonia plans to extend *motorway use charges* to all users, including foreign vehicles.[5] A quarter of the proceeds would accrue to the transport sector in the region.

A number of *fiscal measures to reduce energy consumption* in the different sectors have been or are being implemented. They encompass the fiscal deductions for commuting to work with clean transport, the fiscal deductibility for the purchase of clean vehicles, a reduction of excise duties to promote bio fuels, an increase in excise duties for normal fuels, and fiscal incentives for energy efficiency investments in the residential sector.

However, Belgium still has *fiscal incentives that work against environmental concerns* and that should be removed, such as incentives for the use of company cars and sport utility vehicles. Current tax breaks (companies can deduct 75% of the costs of the cars as a business expense) have led to a high share of company cars in the total vehicle stock (one-third) and an inefficient vehicle stock because companies tend to purchase cars with larger engines. Sport utility vehicles are considered to be commercial vehicles and owners do not pay VAT.

3.3 Greening fiscal measures

The 1998 OECD environmental performance review recommended that Belgium place greater emphasis on the *greening of fiscal measures*, i.e. modifying them so as to reduce pressure on the environment without increasing the total tax burden. A thorough and systematic examination of tax provisions that increase pressure on the environment has not yet been carried out. Nor has a green fiscal reform been achieved. Action 22 of the Federal Plan for Sustainable Development 2004-08 aims at developing a strategy "to guarantee the right price" and mentions three possibilities: i) progressively abolishing existing advantages (tax exemptions and deductions) for products and activities that pollute the environment and are not consistent with sustainable development; ii) introducing incentives for environmentally-friendly products and activities and advising against polluting products and activities; and iii) shifting the tax burden from labour to natural resources, as well as creating a double dividend (environment/employment).

3.4 Agricultural subsidies

Since 2002, *agricultural policy implementation* has been totally delegated to the regions (Lambertmont Agreement), but this has had no significant influence on Belgium's support for the agricultural sector as the largest part of its financial assistance is stipulated at the European level, as part of the Common Agricultural Policy (CAP).

In *Flanders*, payments for arable land and beef are decoupled from production, while it is estimated that about 25% of payments will be coupled to production. Total payments to farmers amount to EUR 180 million/year.[6] In 2005, Flanders introduced the new "single farm payments" scheme developed under the CAP reform, which includes requirements to respect environmental, food safety and animal welfare standards and to keep farmland in good agricultural and environmental condition ("cross-compliance"). *Wallonia* will also implement the new principles of cross-compliance and decoupling of the subsidies introduced by the 2005 CAP reform, which apply to some 760 000 ha of agricultural land, or half its territory.

4. Integration of Environmental Concerns in Sectoral Policies (agriculture, energy)

4.1 Agriculture

As a follow-up to the 2002 Lambermont Agreement delegating responsibility for agricultural policy to the governments of Flanders and Wallonia, the federal government and the two regions have concluded *co-operation agreements*.

Rural development programmes

Up to 2003, three programmes were implemented in Belgium: one at the federal level, one for Flanders and one for Wallonia. The *federal* horizontal rural development programme aimed to facilitate the development of agricultural areas with an emphasis on increased use of environmentally-friendly production methods and preservation of both the countryside and biodiversity. The programme encouraged organic farming and established demonstration projects and aid schemes for business management. Planned public expenditure over the period 2000-06 was EUR 156 million, including an EU contribution of EUR 72 million. The federal rural development programme ended in 2003 following the Lambermont Agreement. The measures have since been included in the regions' rural development programmes.

For the period 2000-06, funding of *Flanders' and Wallonia's rural development programmes* amounted to EUR 537 million and EUR 275 million, respectively; this included a contribution of EUR 214 million and EUR 104 million, respectively, from the European Agricultural Guidance and Guarantee Fund (EAGGF) Guarantee section. In 2004, agri-environmental measures accounted for 23% of Flanders' expenditure on rural development programmes and 45% of Wallonia's expenditure. Between 2000 and 2004, EU financing of Belgium's agri-environmental measures increased from EUR 5.2 million to EUR 13.5 million (OECD, 2005a). In 2004, total agri-environmental payments in Belgium, including the national contribution, amounted to EUR 26 million.

Flanders

Agri-environmental measures in Flanders are currently estimated to cover about 60 000 ha, or *10% of the Flemish farmland*. These measures address: soil cover (applies to 43% of the farmland benefiting from agri-environmental measures); mechanical weeding; reduction of fertilisers and pesticides in ornamental plant cultivation; conservation of local species threatened by extinction; management of meadow birds; management of field edges; restoring, planting and maintaining of small landscape elements; botanical management; reduced use of fertilisers to protect vulnerable waters (applies to 33% of the farmland covered); conversion of traditional to organic pig farms; organic farming; and integrated fruit production. EUR 16 million was spent on these measures in 2003.[7] An independent evaluation carried out that year in the framework of the EU common monitoring and evaluation approach showed it was too early to measure results and impacts but stressed the importance of an *integrated monitoring and evaluation framework*.

Since 1994, organic farmers can receive hectare support for five years. New measures were adopted in 2001 to *stimulate organic farming*; these led in 2003 to the "Action Plan for Organic Farming II", increasing the hectare support, making it

permanent, and granting extra support to the information centre of the organic farming sector. The total area of organic farming in Flanders increased from about 1 000 to 4 000 ha between 1998 and 2001; it stabilised in 2002, then decreased in 2003 and 2004 to 3 219 ha. This includes just 231 organic farms and represents *only 0.5% of Flanders' total agricultural area*. The decline was mainly caused by a reduction of the area devoted to organic pasture and organic vegetable cultivation.[8]

Wallonia

Agri-environmental measures covered *6% of the Walloon farmland* in 2004. Farmer participation increased up to 2003 (to about 14 000 contracts), with a marked growth in 1999 due to: i) the increased financial attractiveness of some measures (e.g. for hedges); ii) increased access to agri-environmental measures; and iii) effective promotion of the measures by the implementing agency. The decrease in 2004 (to about 12 000 contracts) was linked to the end of the many five-year contracts made in 1999 and to anticipation of new agri-environmental measures in 2005. In 2004, one farmer out of three had at least one agri-environmental contract. Favourite measures concerned planting of herbaceous strips along field edges (50% of the contracts), maintenance of hedges and tree alignments, and planting of a winter soil cover before a spring crop. An evaluation of the programme concluded that its impact was generally positive but could be improved to better target environmental priorities and to ensure regularity in premium payments. A *revised programme of agri-environmental measures* was therefore launched in early 2005.

The number of *organic farms* and areas cultivated for organic farming increased between 1996 and 1999, but the growth then slowed due to strengthened specifications for animal production and difficulty in getting a better market value for organic meat and milk in large department stores. Since 2004, however, conversion of traditional farms to organic farms has again started to increase in response to *a new assistance scheme*. The new scheme, open to all producers, introduces the principle of declining aid with increasing farm area, which favours smaller farms. At the end of 2004, organic farming covered *20 000 ha or 2.7% of Wallonia's total agricultural area* (compared to an objective of 4% set by the Contract for the Future for Wallonia and the Federal Plan for Sustainable Development 2000-04). The number of organic farms was about 480 (Cellule État de l'Environnement Wallon, 2005).

4.2 Energy

Since the early 1970s, Belgium's energy policy objectives have concentrated on *security of supply* based on diversification of geographical sources and fuels, energy efficiency, transparent and competitive energy pricing, and environmental protection.

Despite some progress, Belgium's overall energy intensity is well above the OECD-Europe average as well as rates in neighbouring countries (Figure 4.2). With federal and regional legislation and plans, Belgium has reinforced its current focus on energy efficiency, in line with four key EU directives (labelling of household appliances, fuel economy of passenger vehicles (Chapter 2), energy performance of buildings, combined heat and power). The Belgian National Reform Programme 2005-08, adopted in the context of the European Union's Lisbon Strategy,[9] sets a target of improving energy efficiency by 1% per year.

Energy efficiency efforts at the federal level

At the *federal level*, various tax reductions are granted for *household* energy savings (e.g. replacement of boilers, double glazing, roof insulation, installation of a central heating regulator and energy audits). In 2004, a budget of EUR 39 million was spent on these tax reductions (benefiting 95 000 households). A public energy service (FEDESCO) has been established to promote energy efficiency, primarily in *public buildings* (with initial funding of EUR 1.5 million). In 2006, a public fund (Fund for the Reduction of the Global Energy Cost) was created to finance up to EUR 100 million (in the form of low-interest loans) in energy saving and energy efficiency investments in low-income households. The EU directives on labelling of household appliances and fuel economy of passenger vehicles have been implemented.

Energy efficiency efforts at the regional level

Concerning *industry*, Flanders and Wallonia have directed their efforts at improving companies' energy efficiency through voluntary approaches (Box 4.2). Experience shows that there are a number of prerequisites for an effective use of *voluntary approaches*, including transparency, enforcement and target-setting. Linking the achievement of targets with the allocation of emission credits gives companies a strong incentive to comply with their commitments. The regions should continue efforts to ensure that information about the energy efficiency requirements negotiated with companies is transparent and widespread: NGOs and trade unions often complain about the lack of transparency. The regions, in co-operation with federal fiscal authorities, should also ensure that penalties for failing to meet the requirements are duly applied. More generally, the costs of voluntary agreements should be monitored in order to assess their cost-effectiveness.

Concerning *building codes and the energy performance of buildings*, the three regions are progressing in line with the EU directives. This is a key area for Belgium, as its buildings often show poor energy performance due mainly to poor compliance with building standards. In *Flanders*, a May 2004 act provides the basis for the introduction of minimum energy performance requirements for buildings. Implementation of the EU

directive on the energy performance of buildings started in January 2006. *Wallonia* is currently examining how it will implement this directive. To increase the energy efficiency of buildings, it provides financial incentives for heating systems, insulation, energy audits, efficient new lodgings, etc. So far about EUR 13 to 40 million (IEA, 2005) have been granted as financial incentives through the energy fund. Wallonia also supports public awareness programmes related to the energy efficiency of buildings and provides training for professionals such as architects and building contractors (Ministère de la Région Wallonne, 2001). *Brussels-Capital's existing building*

Box 4.2 **Energy efficiency: voluntary approaches in Flanders and Wallonia**

Flanders relies on two types of voluntary approaches: benchmarking covenants and audit covenants. *Benchmarking covenants apply to large energy-intensive companies* (or companies which fall under the EU Emissions Trading Scheme – ETS) which agree to be among the top world performers in energy efficiency by 2012. Efficiency obligations are determined by independent experts. A 2004 review of these agreements indicates that 60% of energy consumption of the 180 companies that have entered into benchmarking covenants is related to companies that have already achieved a world class level of efficiency. Due to such agreements it is estimated that overall, companies in Belgium will have improved their energy efficiency by 7.8% by 2012 as compared to 2002. In return, the Flemish government exempts the companies from additional energy efficiency requirements under its responsibility, including any CO_2 taxes, and will strive to exempt these companies from additional federal or European measures. Moreover, companies that implement the necessary measures and investments in time are allocated sufficient emission credits under the EU ETS, and if they increase their energy efficiency efforts, can benefit from economic support. *Audit covenants apply to medium-sized energy-intensive companies*, which do not fall under the EU ETS scheme. An audit evaluates companies' potential energy savings and identifies possible measures. The energy efficiency plan of the company must then contain all measures with the highest internal rate of return (IRR above 15 within the first four years of the agreement; IRR above 6 in the following years). Companies that enter into these agreements benefit from economic support and from the same exemptions awarded to large companies with benchmarking covenants.

Wallonia has signed agreements with 117 energy-intensive firms covering more than 90% of the region's industrial energy consumption. Firms commit themselves to developing action plans and providing annual reports. In return, they benefit from subsidies for energy accountancy and audits, exemptions from additional regional requirements (including any CO_2 tax), exemptions from green certificates, and realistic CO_2 allocations under the EU ETS. In both regions, 13.5% of energy efficiency investments can generally be deducted from taxable income.

regulations include minimum energy performance criteria for buildings built or renovated since 2000. These regulations are being revised to introduce the additional requirements of the EU directive. In sum, work is under way to bring Belgium in line with the EU standards, but it will be critical to ensure that the new standards are effectively enforced.

Concerning *combined heat and power* (CHP), the three regions have developed various strategies to comply with the new EU directive. *Flanders* has introduced a CHP certificate system based on electricity production to be purchased by electricity suppliers, while *Wallonia and Brussels-Capital* use comprehensive "green certificate" schemes based on avoided CO_2. Wallonia and Brussels-Capital have harmonised their systems to permit trading of the permits. In Flanders, however, certificates from outside the region cannot be used on the Flemish market. Harmonisation of these various schemes should be pursued to ensure that CHP certificates are tradable in the three regions in order to maximise efficiency.

The energy policies of all three regions *include* "*rational use of energy*" *public service obligations, which require* savings in energy consumption.

Energy mix: renewable energy sources

Belgium's *total primary energy supply* includes: coal and coal products (10.1%), oil (42.2%), natural gas (24.6%), nuclear energy (21.1%) and renewable energies (2%) (Figure 4.2) (Reference I.B). Nuclear electricity represents about 55% of total electricity production. Efforts are being made to increase the share of renewable sources of energy. The indicative objective set by the EU for Belgium is to reach *6%* "*green electricity*" *by 2010*. The federal government and the three regions have instituted green certificate schemes which force energy suppliers to ensure that a growing part of electricity comes from renewable sources.

There is scope, however, for improving the effectiveness and efficiency of the *green certificate schemes*. With the exception of the certificates issued in Wallonia and in Brussels-Capital, which can be exchanged, most certificates issued cannot be traded among regions. All regions and the federal government should make efforts to ensure the transferability of all green certificates. To that end, a working group (under ENOVER[10]) was established at the end of 2005 to promote mutual recognition of green certificates. In addition, penalties for non-compliance should be higher than the costs of compliance in all periods (this is already the case in Flanders).

Although the adoption of a green certificate market is commendable, a systematic review of the cost-effectiveness of the other incentives and support schemes that Belgium has adopted for *promoting the use of renewable energy* is needed.

Energy prices

Available data on Belgium's energy prices show that *households* pay higher prices for all sources of energy (electricity, fuel oil, natural gas) than *industry*, and that prices paid by Belgian industries tend to be lower than the OECD average (Table 4.4).

Although the energy laws of 1999 prohibit cross-subsidisation, Belgium has *different taxation levels for different classes of customers*. For instance, industry exemptions from the special tax on domestic energy products suggest a cross-subsidy from residential to industrial customers.

Belgium offers *social* tariffs (for electricity and gas) and energy grants for "protected residential customers".[11] In 2005, the income transfer through the lower electricity and gas tariffs was about EUR 100 for each of the 190 000 protected households in the electricity market and about EUR 75 for each of the 160 000 protected households in the gas market. These households pay no fixed charges in either market. All protected customers in the electricity market receive 500 KWh of electricity free per year while less than 10% of protected customers in the gas market receive 2 000 MJ of natural gas free per year. At the federal level, a social fund for heating oil provides rebates to low-income heating oil consumers during high-price periods as well as some 500 to 1 000 litres of free heating oil per year (about 20-40% of their average consumption).

Table 4.4 **Energy prices**[a]

		Electricity		Fuel oil				Natural gas	
		Industry	Households	Industry		Households		Industry	Households
		(USD/kWh)	(USD/kWh)	High sulphur[b] (USD/tonne)	Low sulphur[b] (USD/tonne)	Light (USD/'000 l)	Light (USD/'000 l)	(USD/10^7 kcal)	(USD/10^7 kcal)
1996	Belgium	0.073	0.187	162.0	154.4	232.7	281.6	132.6	451.8
	OECD	0.071	0.117	161.8	. .	242.6	376.0	142.2	353.8
2005[c]	Belgium	0.048	0.132	160.4	152.8	534.9	647.2	Confidential	407.7
	OECD	0.060	0.101	205.8	. .	500.5	676.8	167.4	348.1

a) At current exchange rates.
b) Heavy fuel oil. High sulphur ceased in 2003.
c) 2000 for electricity and natural gas; 2002 for high sulphur and low sulphur fuel oil for industry.
Source: OECD-IEA (2006), Energy Prices and Taxes, first quarter.

In 2005, the federal government sent a cheque of EUR 100 (on average) to eligible households to *cushion the impact of rising heating oil prices*. In 2006, a similar measure was implemented for natural gas (with cheques up to EUR 44/ household). In Flanders, a grant of a fixed amount of free energy to all residential consumers (not just low-income ones) has been introduced: all households receive 100 KWh of free electricity per family per year plus an additional 100 KWh for each family member. Direct support granted to lower-income consumers only would achieve better social policy objectives.

Belgium's October 2005 declaration of federal policy advocates a *reasonable energy price* for everybody in order to stimulate economic growth. However, it is unlikely that substantial progress in reducing energy intensity can be made without further adjusting prices and internalising fully external costs. In general, consumers use energy more efficiently if prices accurately reflect the costs, including environmental costs.

5. Climate Change: Institutions and Policy Measures

5.1 Institutional arrangements

The split of responsibilities between the federal government and the regions reinforces the need for co-operation and co-ordination of policies. This is particularly the case with respect to the *Kyoto Protocol* ratified by the federal and regional governments but primarily implemented by regional governments (Table 4.5).

Belgium has established different structures to promote consultation and co-operation between the different Belgian authorities. The *Interministerial Conference for the Environment* (ICE), which plays a central role in climate policy, includes the Federal Minister of the Environment, the environment ministers of each of the three regions, and a number of other federal ministers or state secretaries, currently the ministers in charge of economy and mobility (and North Sea), and the State Secretary for Sustainable Development. Given the scope of climate policy, an enlarged ICE climate group has been meeting since 2000. In addition to ICE members, the ICE "Climate" includes: the Prime Minister; the federal ministers for foreign affairs, energy, finance, budget and co-operation development; the Minister-President of the regions; and the regional ministers for economy, energy, mobility or transport. ICE decisions are prepared by the Co-ordination Committee for International Environmental Policy (CCIEP).

The *Greenhouse Effect Co-ordination Group* is subordinate to the CCIEP. Its mission is to encourage and provide a forum for collaboration among federal, regional and community institutions involved in climate policy regarding international matters (Table 4.5). It is responsible for preparing the position of the

Table 4.5 **Division of authority in the context of climate change policy**

ENVIRONMENT	
Federal government	Establishment of product standards
	Protection against ionising radiation
	Management of radioactive waste
	Waste transit
	Marine environmental protection
	Co-ordination of the international environmental policy
	Combating illegal logging
Regions	Environmental protection (air, water, the ground, the lower layers of the ground)
	Waste management
	Legislation on dangerous or harmful installations (permits and inspection)
	Water policy
	Nature conservation and hunting
	Forest management
Provinces and municipalities	Operation permits/environmental permits
	Compliance with environmental legislation (police)
ENERGY	
Federal government	Guidelines for electricity production (regulates and collaborates with the Energy Adm.)
	Cycling of nuclear fuels
	Major infrastructure for the storage, transport and production of energy
	Tariffs
Regions	Local distribution and transport of electricity (≤70 000volts)
	Public distribution of gas
	Long distance heat distribution networks
	New sources of energy (with the exception of nuclear energy)
	Energy recovery
	The rational use of energy
	The use of firedamp, of gas from blast furnaces and putting slag heaps to good use
Municipalities	Local distribution of electricity and gas
PUBLIC WORKS AND TRANSPORT	
Federal government	National airport
	Railways
	Traffic regulation
	Taxes on vehicles and fuels
	Technical standards for vehicles
Regions	Construction and maintenance of highway infrastructure
	Seaports, piloting, waterways
	Regional airports
	Urban and regional public transportation
	School transportation
	Taxis
Municipalities	Urban network
	Traffic rules (police)
	Mobility plans

Table 4.5 **Division of authority in the context of climate change policy** *(cont.)*

TOWN AND COUNTRY PLANNING	
Regions	Town and country planning Industrial estates and areas
EDUCATION, TRAINING AND PUBLIC AWARENESS	
Federal government, regions, provinces, municipalities	Training and public awareness in the areas that are part of their respective competence
Communities	Education Media

Source: Belgium's third national communication under the UNFCCC, April 2002.

Belgian delegations in international meetings and forums, whenever matters related to climate change are debated. The Co-ordination Group secretariat is provided by the Federal DG Environment, which is also the *national focal point* for the UN Framework Convention on Climate Change UNFCCC).

The *National Climate Commission* was created to support the follow-up to the Co-operation Agreement for the Implementation of a National Climate Plan and reporting under the UNFCCC and the Kyoto Protocol (ratified in 2003), which frames the climate policies *implemented* by the different Belgian authorities.

An *internal burden-sharing agreement* among the federal and regional governments was adopted under the aegis of the National Climate Commission in March 2004. According to this agreement the three regions have different targets for 2008-12: for Wallonia, an emissions reduction of 7.5% below 1990 levels; for Flanders, a reduction of 5.2%; and for Brussels-Capital, an increase of 3.5% (Table 7.4). The regions will receive emission rights under the Kyoto Protocol equal to these targets. In 2003, the sum of the regional targets exceeded Belgian's assigned amount under the Kyoto Protocol by approximately 12.4 Mt of CO_2 equivalent, including the federal authority plan to compensate 2.46 Mt/year[12] by purchasing emission credits on the international market (Table 7.4). Up to 2007, the gap must be filled by joint implementation (JI) early credits and clean development mechanism (CDM) projects.[13] At the end of 2005, Belgium had already launched its first JI and CDM tenders, for which EUR 9.3 million has been made available. This budget

comes from the "Kyoto Fund", which had an initial budget of EUR 25 million. An additional budget of EUR 50 million has been allocated to new initiatives (second JI-CDM tender and investments in carbon funds). After 2007, Belgium may wish to purchase reduction units on the international market from countries with excess emission units (listed in Annex B of the Kyoto Protocol). However, the federal government has decided that the units will be purchased only if the gap cannot be filled by credits obtained from JI and CDM projects.

5.2 Measures to meet the Kyoto target

Each of the three regions has developed a climate plan to meet its respective target under the burden-sharing agreement, and the federal government has adopted a number of additional policies and measures that will contribute to emission reductions within the regions (Box 4.3). In addition, a *comprehensive national climate plan* to meet Belgium's Kyoto commitment is under development.

Although numerous measures have been adopted and/or are being implemented at the federal and regional levels, their cost-effectiveness or emission reduction potential does not appear to have been evaluated. Such analysis is needed for setting priorities, and should be part of the *national climate change plan* under preparation. Many of the measures take the form of financial assistance and should be assessed from the point of view of environmental effectiveness and economic efficiency.

Belgium has also become a party to the *EU Emissions Trading Scheme* (EU ETS), which is a mandatory cap-and-trade emissions market for industrial and combustion installations. According to this scheme, each country establishes a national allocation plan, which is an accounting of the total quantity of CO_2 emissions allocated to their energy and industrial companies and installations, which can then be bought or sold in the EU ETS market. The national allocation plan 2005-07 was completed by Belgium and agreed by the European Commission in 2004. In 2003, CO_2 emissions in sectors covered by the EU trading scheme amounted to 58.2 Mt. The regions have proceeded to allocate an average annual amount of 59.5 million allowances for the period 2005-07[14] to energy and industrial installations, although using different allocation rules. Industrial installations are allocated allowances on the basis of benchmarking covenants in Flanders, and of voluntary agreements in Wallonia. Energy plants received emission allocations on the basis of historical data and several growth and reduction scenarios. A national register is operational: 55.3 Mt of verified CO_2 emissions for 2005 have been introduced and almost all participating installations have submitted a report on the number of allowances equivalent to their verified CO_2 emissions.

Box 4.3 **Selected policies and measures to meet the Kyoto target**

The following policies and measures are to be implemented:

At the federal level:

- siting two off-shore wind energy plants in the North Sea (located on the Thornton Bank and the Bank zonder Naam);
- switching two coal-fired power plants (located in Mol and Awirs) to biomass by 2009;
- granting fiscal advantages to promote bio fuel uptake (2% biomass content in 2005; 5.75% in 2012);
- implementing the EU CO_2 cars strategy (final objective of 120g CO_2/km, 140g CO_2/km by 2008-09);
- switching the federal administration's car fleet to clean technologies through public procurement rules and management agreements with state-owned enterprises;
- establishing a government funding scheme for third-party financing (FEDESCO established with a starting capital of EUR 1.5 million);
- adopting measures to promote more economical driving behaviour (through a sustainable mobility plan);
- promoting the EU energy labeling scheme for household appliances;
- deciding on the construction of a Regional Express Network (RER) around Brussels;
- promoting public transportation (civil servants to commute by train free of charge, reducing fiscal deductibility of car use for commuting) (implemented since 2004);
- granting subsidies for freight transport by rail (EUR 30 million in 2005 compared to EUR 15 million in 2004);
- promoting sustainable energy use in federal agencies through environmental management schemes;
- providing enhanced tax incentives for investments in household energy efficiency and use of renewable energy;
- granting tax deductions for energy efficiency investments in industry;
- offering tax advantages for cars with low emissions (already implemented).

In Flanders:

- implementing benchmarking agreements with large energy-intensive industrial companies;
- developing energy audit agreements with medium-sized energy-intensive industrial companies;
- implementing a green certificate scheme;

Box 4.3 **Selected policies and measures to meet the Kyoto target** *(cont.)*

- implementing legislation on energy performance standards for new buildings; renovating existing buildings;
- implementing voluntary agreements with local authorities on sustainable development;
- implementing a combined heat power (CHP) certificate scheme (system operational from January 2005);
- promoting green heat;
- developing a comprehensive mobility plan, including reduction of transport demand, changing transport modes, increasing public transportation and infrastructure, promoting cleaner vehicles, introducing bio fuels, public awareness-raising on eco-driving skills;
- granting subsidies for energy investments in industry;
- reducing N_2O emissions from nitric acid and caprolactam production;
- implementing F-gas reduction programme;
- promoting energy efficiency in greenhouse agriculture;
- exploiting synergies between manure policy and climate policy;
- local production of biomass for energy;
- executing the climate action plan for the agriculture sector;
- monitoring energy use in 255 public buildings and auditing energy use in the 100 largest public buildings;
- conducting on-going information campaigns on the efficient use of energy.
- setting up an energy innovation agenda;
- granting financial incentives for energy efficient measures;

In June 2005, a wide consultation process started with all economic sectors, social unions, local authorities, environmental groups and independent experts. In the course of this process, the Flemish government and the target groups signed a declaration of commitment in support of the Kyoto objectives. It is expected that the new Flemish Climate Plan 2006-12 will integrate the commitment.

In Wallonia:

- implementing the EU directive on emissions trading;
- promoting the transport of goods by boat (in recent years the waterway network has been made more attractive and reliable);
- preserving natural ecosystems and their carbon stocks;
- increasing methane recovery from landfill sites;
- granting financial incentives for domestic insulation and solar boilers;
- free public transportation for civil servants;
- insulation standards for new buildings;

Box 4.3 **Selected policies and measures to meet the Kyoto target** *(cont.)*

- implementing voluntary energy-audit covenant agreements with energy-intensive industry;
- promoting renewable energy sources and cogeneration;
- implementing a green certificate scheme;
- promoting the rational use of energy in industry, tertiary and residential sectors;
- strengthening standards and compliance monitoring for insulation, boilers etc;
- improving public transit and promoting green mobility;
- creating a multimodal transport platform;
- granting financial incentives for energy audits.

In Brussels-Capital:

- reducing energy consumption in the household, tertiary and industrial sectors;
- improving road traffic (development over the last decade of a regional express train network (RER)/suburban express railway);
- promoting renewable energy sources and cogeneration and rational use of energy (information, funding and subsidies);
- developing a green certificate scheme (already implemented).

Amended to follow the Belgian burden-sharing agreement, the Regional Air-Climate Plan (2002-10) includes measures to address the first two objectives.

In the *Brussels-Capital Region*, a plan for 2002-10 for improvement of air quality and for combating climate change was adopted in 2002. Subsequently amended in light of the burden-sharing agreement, the plan aims to reduce road traffic and energy consumption in residential heating and industry, so as to lower the region's greenhouse gas emissions. The new RER (suburban express railway system), when it opens later this decade, is expected to significantly improve the situation.

In order to comply with the *Kyoto commitment*, however, it will be necessary to achieve an additional reduction (over two-thirds of all reductions) outside the EU emission trading scheme. This will have to come from the residential/commercial and transport sectors or through the use of flexibility mechanisms. At the regional level, it seems that Wallonia will achieve more than its necessary reductions from savings through the EU ETS. For Flanders, because its emissions reductions are coming primarily from the EU ETS, about two-thirds of the remaining reductions will have to come from other sectors. In Brussels-Capital, as only a small part (less than 2%) of

emissions are covered by the EU ETS, emissions reductions will be needed in sectors outside the EU ETS. Achieving emissions reductions outside the energy and industrial sectors will be challenging, because the stakeholders are much more widespread and numerous than in the sectors covered by the EU emission trading scheme, and because establishing a single strong monitoring and enforcement mechanism will not be possible due to the wide range of policies and measures.

As Belgium starts to use the EU Emissions Trading Scheme, a careful analysis of the abatement costs in all sectors and of all options, including the purchase of emission credits on the international market, should be made. *Cost-effectiveness* analysis should be applied in deciding how much of the Kyoto commitment should be met through emissions trading, how much should be achieved from domestic policies (at both regional and federal levels), and how much should be purchased by the federal or regional governments from the international market (including credits from JI and CDM projects). The scheme will bring multiple benefits, not only concerning greenhouse gas emissions, but also concerning traditional pollutant emissions, as well as energy savings and increased energy independence.

6. Implementation of Environmental Policies

6.1 Institutional set-up

Division of environmental responsibilities

The division of environmental responsibilities between the federal government and the regions *remained essentially stable* over the review period. The Belgian environmental federalism was defined as part of the overall evolution of the country into a federal state made up of *three communities* and *three regions* (Box 4.4). Article 23 of the Constitution gives every Belgian "the right to enjoy the protection of a healthy environment". The *three regions* have the main responsibility for environmental policy, including air, water and noise policies, nature conservation and hunting (as well as household waste management in the Brussels-Capital Region). The *federal government's authority* is mainly in the areas of product standards, nuclear safety (including radioactive waste management and protection of the population against ionising radiation), waste transit across the country, trade in endangered species of wild fauna and flora, protection of the marine environment and co-ordination of international environmental policy. The ten *provinces* share some powers with their regional government, and *municipalities* have a key role in areas such as household waste collection.

Box 4.4 **Institutional context**

The Kingdom of Belgium is a constitutional monarchy. The *1993 reform of the Belgian Constitution* was the latest in a series of constitutional changes (others occurred in 1970, 1980 and 1988) which have transformed the country into *a federal state made up of three communities and three regions*. The three communities are French, Flemish and German-speaking. The three regions are Wallonia, Flanders and, since 1989, Brussels-Capital.

General government structure

Decision-making power is shared by the federal government, the three communities and the three regions, which are equal in law and exercise their responsibilities autonomously in various fields. The division of federal, regional and community competencies originated from the Constitution, the Special Law of Institutional Reform of 1980, or specific co-operation agreements. The *federal government* is responsible for matters of general interest, independently of any linguistic, cultural or territorial considerations, and for the protection of Belgian interests abroad. It is responsible for justice, "law and order" (federal police), social security, labour regulation and worker protection, monetary and fiscal affairs, foreign policy (including immigration policy), national and civil defense, policies regarding territorial waters, the Exclusive Economic Zone and the continental shelf. The federal government has also some responsibility in the areas of economy, agriculture (food safety), transport (rail) and environment. The three *communities* deal with "person-related matters". This includes cultural matters (including media regulations), education, use of languages, and some aspects of health policy, youth protection and sport. The three *regions* deal with territorial matters; they have authority for socio-economic matters such as zoning and planning, housing, environment, economic development, employment, energy, public works and transport.

The *federation, communities and regions each have their own parliament and government*, although the Flemish community and the Flemish region are the same entity; hence there are a total of six distinct governments and parliaments. Various structural relationships among the parliaments provide connections between different levels of decision-making. Laws adopted by regional parliaments cannot be annulled by the federal parliament. Even when an issue is a matter of federal responsibility, the regions can take measures as long as the measures are identical in each of the three regions (e.g. in the case of the proposal on packaging waste). The regions also have the authority to autonomously negotiate and sign international treaties relating to the policy areas for which they have exclusive responsibility. The federal parliament consists of a 150-member House of Representatives and a 71-member Senate. The federal government has a Prime Minister's Department and a maximum of 15 ministries. Junior ministers, called "State Secretaries", can also be nominated; they usually do not take part in the Council of Ministers meetings.

Box 4.4 **Institutional context** *(cont.)*

Flanders consists of five provinces (Antwerp, Flemish Brabant, West Flanders, East Flanders and Limburg) and 308 municipalities. Its parliament has 124 members and a 15-member standing committee on the environment and nature conservation. Wallonia has five provinces (Walloon Brabant, Hainaut, Liège, Luxembourg and Namur) and 262 municipalities; its parliament has 75 members. Brussels-Capital has 19 municipalities (no province) and two official languages (French and Flemish). Its parliament has 75 members; of its seven standing committees, three deal with issues concerning the environment, infrastructure and spatial planning.

Development of environmental policies

The precursor of Belgium's current environmental regulatory framework, a law on classified installations, was adopted as early as 1810. The Hunting Law and the Forest and Rural Codes, all more than a century old, are among the earliest examples of environmental legislation in Belgium: many times modified, they are still in force. Between the mid-1960s and mid-1970s, a number of national laws were enacted to address various environmental concerns including air and water pollution, nature conservation, noise and hazardous waste. A minister responsible for environment was nominated for the first time within the then "national government" in 1973. Transfer of environmental competencies was initiated in 1974, on a provisional and experimental basis. Subsequently, environmental protection, nature conservation, waste and water management and spatial planning became regional responsibilities with the passing of the Special Institutional Reform Law of 8 August 1980. Each region has developed its strategic environmental planning with regular state-of-the-environment reports and action plans. In May 1997, the federal government adopted a law requiring federal plans for sustainable development to be adopted every four years.

During the review period, several federal ministries were transformed into *federal public services* (FPS) to strengthen their public service role. Environmental Affairs became one of the five Directorates-General of the FPS for Health, Food-Chain Safety and Environment (which is one of 14 federal public services). In 2003, a specific department on climate change was set up within the Directorate-General Environment, and increased resources were put into inspections and marine policy. The federal government can have a bigger impact on environmental issues in Belgium than its limited portfolio would suggest, through, for example, its powers over fiscal policy, energy and transport issues. The adoption of the *Federal Sustainable Development Plan* should help to guide such policies so that environmental factors are taken into account in decisions in these and other fields.[15]

Co-ordination and co-operation

Belgium's federal structure calls for good co-ordination and co-operation between the federal government and the three regions on environmental matters, and sometimes with the three communities as well (e.g. concerning education and health). Such co-ordination is arranged through several mechanisms. One of the most important is the *Co-ordination Committee for International Environmental Policy*, whose main task is to ensure that Belgium speaks with one voice at the international level. The CCIEP meets once a month in plenary to take decisions, but has several sub-groups dealing with different issues, with each group led by a representative from a federal or regional administration. The CCIEP plenary consults with relevant stakeholders.

Sixteen *inter-ministerial conferences*, including one for environment, deal with transboundary matters or any issue of relevance to governments at federal, regional or community level. They adopt co-ordinated decisions at the political level (between federal and regional ministers). In addition, *co-operation agreements*[16] have been established between the federal government, Flanders, Wallonia and the Brussels-Capital Region on environmental data, air monitoring, waste, biosafety, environmental management systems and other issues. An example of such co-operation is the 1999 agreement on the control of major accident hazards involving dangerous substances (the EU Seveso Directive) (Table 4.6). Flanders signed a co-operation agreement with provincial and municipal governments in 2002, offering them financial assistance to set ambitious goals and implement related actions in the fields of environment and sustainable development (Box 4.5). Many stakeholders also co-ordinate their efforts at a national level, thereby creating a web of (less formal) co-operative arrangements. On waste, for example, there are structures for co-operation at both government and industry levels.

The fact that the federal government and the regions are seen as equal partners could in principle create difficulties in *solving common problems* in environmental management. In practice, however, there are few examples of such problems, although an exception is the drawing up of a new noise abatement plan for the Brussels-National airport run by federal authorities, established in Flanders (Zaventem), while many people affected by air traffic noise and asking for changes to the plan live in the Brussels-Capital Region.

6.2 Environmental policy objectives

Environmental policy objectives are first set in legislation, *much of which is driven by EU directives and international commitments*. As a founding country of the European Union, Belgium has influenced and been influenced by EU environmental legislation. Environmental policy objectives are also defined in federal or regional government declarations and federal and regional sustainable development and environmental plans.

Table 4.6 **Selected federal and regional environmental legislation and regulations,**[a] since 1998

FEDERAL	
1998	Law on Product Norms aiming at the Promotion of Sustainable Means of Production and Consumption and at Environment and Health Protection, amended (2003, 2004)
1999	Law on the Protection of the Marine Environment in Marine Areas under Belgian Legislation, amendment of the Judicial Code (1999)
1999	Law on the Belgian Exclusive Economic Zone in the North Sea
2001	Royal Order creating the Federal Public Service for Health, Food-Chain Safety and Environment
2001	Royal Order on Species Protection in the Marine Environment under Belgian Legislation
2002	Royal Order creating a Federal Public Planning Service on Sustainable Development
2003	Royal Order on the Protection of Wild Species of Fauna and Flora through the Control of their Trade
2005	Royal Order on the First Programme aiming at Reducing Pesticide and Biocide Use in Agriculture
2005	Royal Order on the Designation of Special Protected Areas and Special Areas of Conservation in the Marine Areas under Belgian Jurisdiction
2006	Royal Order on the Designation of Marine Reserves in the Marine Areas under Belgian Jurisdiction.
2006	Law on the Assessment of the Effects of Certain Plans and Programmes on the Environment and providing for Public Participation in respect of the Drawing up of such Plans and Programmes
2006	Law on Public Access to Environmental Information
CO-OPERATION AGREEMENTS BETWEEN THE FEDERAL STATE, FLANDERS, WALLONIA AND THE BRUSSELS-CAPITAL REGION	
1995	Agreement on International Environmental Policy
1997	Agreement on the Administrative and Scientific Co-ordination regarding Biosafety
1999	Agreement on the Control of Hazards linked to Major Accidents involving Dangerous Substances
2002	Agreement on the Establishment, Fulfillment and Follow-up of a National Climate Plan
2003	Agreement with the Flemish, French and German Communities, the Common Community Commission and the French Community Commission in the Environmental and Health Fields
2004	Agreement between Flanders, Wallonia and the Brussels-Capital Region regarding the Management of Regionalised Matters in the field of Agriculture and Fisheries
FLANDERS	
2001	Decree on Animal Manure Management
2001	Decree on Pesticide Use by Public Authorities
2002	Decree on Water Intended for Human Consumption
2002	Decree on Environmental Impact and Safety Reporting
2003	Decree on Integrated Water Policy
2004	Decree on Environmental Information
2004	Decree on Environmental Auditing
2004	Decree on Greenhouse Gas Emissions
2004	Order of the Flemish Government on the Introduction of the Integral Annual Environmental Report
2004	Decree on Energy Performance and Indoor Air Quality of Buildings
2004	Decree on Financing the Water and Waste Water Services

Table 4.6 **Selected federal and regional environmental legislation and regulations,**[a] since 1998 *(cont.)*

WALLONIA	
1999	Decree on Environment Permits
2 002	Order from the Walloon Government Requiring the Trade-in of some Waste
2003	Order from the Walloon Government on the Creation of the Scientific Platform "Environment – Health"
2004	Decree on Sustainable Use of Energy
2004	Order from the Walloon Government Forbidding the Burial of some Waste in Landfills
2004	Decree on Soil Management
2004	Order from the Walloon Government on Noise Evaluation and Management in Environment
2004	Decree on Book I of the Environmental Code
2004	Decree on Book II of the Environmental Code establishing the Water Code
2004	Decree on Greenhouse Gas Emissions
BRUSSELS-CAPITAL	
1999	Edict on the Crackdown on Environmental Infractions, amended (2001)
1999	Edict on the Evaluation and Improvement of Air Quality
1999	Edict on Paper and Cardboard Waste Management, amended (2004)
1999	Edict from the Brussels-Capital Region Government drawing up the List of Class IA Installations (Environmental Permits)
2000	Edict amending the 1991 Edict on Wildlife Conservation and Hunting
2000	Edict amending the 1991 Edict on Access to Environmental Information, amended (2004) (Aarhus Convention)
2000	Edict amending the 1991 Edict on Prevention and Management of Waste
2001	Edict on the Funds to Finance Water Policy
2001	Edict on Various Amendments concerning Environment Permits
2004	Edict on the Strategic Impact Assessment of Plans and Programmes (SIA)
2004	Edict on Restriction of Pesticide Use in Public Spaces
2004	Edict amending the 1997 Edict on the Prevention of Noise in Urban Areas
2004	Edict on the Management of Polluted Soils

a) Including co-operation agreements between the federal state and the Flemish, Walloon and Brussels-Capital Regions, since 1995.

Source: Federal Public Service for Health, Food-Chain Safety and Environment; VMM; DGRNE; IBGE-BIM.

More generally, federal and regional policy priorities are issued in a government statement after every election. Each year, every federal public service issues both a policy note outlining how it intends to implement the government statement and a follow-up note outlining how actions outlined were carried out, and how targets were achieved. During the review period, the federal authority, Flanders, Wallonia and Brussels-Capital governments were all *very active* in environmental legislation and regulation (Table 4.6). In addition, they entered into *co-operation agreements* together (concerning international environmental co-operation, accidents involving hazardous substances, climate change), and with communities concerning health and environment.

Box 4.5 **Co-operation agreements between the Flemish Region and provincial or municipal authorities**

Local authorities (i.e. provincial and municipal) are important actors in the implementation of environmental policy; on average 9% of municipal budgets are allocated to environmental management and nature protection in Flanders. The Flemish government signed its first *voluntary agreements with local authorities on environmentalgovernance* in 1992, in connection with the first Flemish environmental policy plan. The principle of these agreements was simple: a province or municipality gets financial assistance from the regional government if it develops and implements a policy for environment and nature protection. Emphasis was first on setting up institutions (e.g. an environmental officer or department and an environmental board) and formulating policies on waste and nature. Later, local authorities were offered different policy-making options under the voluntary agreements, according to their particular circumstances and priorities. In 2001, the results of the agreements were reviewed and were used to update voluntary agreements between the regional government and local authorities, as part of a new programme called "*Environment as a Stepping Stone to Sustainable Development*". The programme made sustainable development the central concept of the agreements and required integration of environmental and other key policy areas. Local governments are encouraged to co-operate.

A key feature of the new type of co-operation agreement is *flexibility*. Local authorities can choose among *three different levels of ambition*, and get increased financial assistance accordingly. Each municipality must put some policy instruments in place, and take action in two or more of several "clusters" of policy issues: solid waste, water, natural entities, mobility and energy. For example, a municipality which signs an agreement at level 1 must put the following policy instruments in place: environmental policy plan, annual environmental programme, environmental department, environmental board, databases and inter-sectorial co-operation. In addition, it must implement the provisions outlined in level 1 in the solid waste and water clusters, and (if it has more than 7 500 inhabitants) in two other clusters of its choice. If it decides to advance to level 2, it must assign a sustainability officer, design an environment barometer, and implement the level 1 requirements in all six clusters and level 2 requirements in at least two clusters. Municipalities that opt for level 3 must have a target group policy and an area-oriented policy that integrate policies in most or all of the six policy-issue areas. This is seen as a truly integrated sustainable development policy (as opposed to a set of progressive environmental and related sectoral policies). Requirements for provinces are slightly different and are more stringent than for municipalities, but the building blocks are the same.

To explore an *agreement in more detail*, it is helpful to look at the provisions of one cluster (e.g. solid waste). A municipality signing a level 1 commitment must agree to introduce "green consumption" into its own operations, to encourage waste prevention through increased awareness, to build a container park (collection centre) and organise selective collection, and to set and achieve targets on waste amount per resident.

Box 4.5 **Co-operation agreements between the Flemish Region and provincial or municipal authorities** *(cont.)*

Upgrading to level 2 requires the municipality to develop a composting scheme, to develop specific programmes for schools and its own services, and to set tighter targets for residual waste. Level 3 requires that the policies in the solid waste cluster be part of an integrated project involving all clusters.

As of late 2005, the Flemish government had signed a co-operation agreement with *all five Flemish provinces* (one at level 3 and the others at level 2) and with *250 out of 308 municipalities* (153 at level 1, 92 at level 2 and one at level 3). Financial assistance is awarded for each cluster achievement according to the level of ambition. The Environment as a Stepping Stone to Sustainable Development programme is seen in Flanders as a success both in stepping up the environmental ambitions of local authorities and in encouraging innovative solutions to specific challenges, which can then be emulated by others.

These agreements are considered drivers of Flanders' impressive record in *waste reduction, reuse and recycling* (the "3Rs"). Since 1990, the proportion of waste going to selective collection and recovery has increased from 10% to 70%. Instruments used included: *information instruments*, such as awareness campaigns aimed at students and the general public to influence buying habits and encourage composting and recycling; *economic instruments* such as charging households and companies for waste according to volume or weight; and *voluntary instruments* with industry, based on producer liability. Flanders' overall goal is to reduce the quantity of waste going to landfill or incineration to 150 kg per person per year.

EU environmental legislation

Concerning transposition of *EU environmental legislation*, Belgium has greatly improved its record in recent years (Box 7.1). While transposing EU environmental law into domestic law has been improving, full implementation of several key EU environmental directives has been difficult: examples include the Nitrate Directive in Flanders and the Natura 2000 Directive in Wallonia. Implementing the Water Framework Directive will be a challenge for all three regions. The Brussels-Capital Region (which got regional status in 1989, ten years after the other two regions) has only recently caught up with the backlog of EU legislation that it needed to incorporate.

Planning objectives

In the context of planning, important efforts have been made to assess outcomes and environmental performance. This applies for instance to the second *Federal Plan for Sustainable Development* (2004-08), which focuses on a limited number of themes

and actions, and introduces indicators for measuring progress. A draft law foresees annual reporting on the environmental impact of North Sea policy. In *Flanders*, the Environmental Policy Plan 2003-07 ("MINA-plan 3") is a comprehensive plan outlining both long-term objectives (for 2015-30) and shorter-term objectives to be achieved before 2007. These objectives (which are taken from both international and EU commitments and regional political priorities) are binding and quantified (Table 4.7). In *Wallonia*, the multi-annual plan "*Contract with the Future*" currently focuses on priority tasks: reaching the Kyoto targets, implementing the EU Water Framework Directive, Natura 2000 and the Integrated Pollution Prevention and Control (IPPC) Directive. A comprehensive environmental indicator report, Scoreboard of the Walloon Environment, is issued annually. The cycle of action plans, indicators and review, which require such planning and measurement of progress, was strengthened by the EMAS and ISO-9001 labeling of the regional Directorate General for Natural Resources and Environment (DGRNE) and related environmental bodies in 2004 (Table 4.8). In the *Brussels-Capital Region*, the legally binding *regional development plan* covers environmental objectives in fields such as waste, air, climate, noise and nature protection, with indicators to monitor progress (Table 4.9).

6.3 Regulatory instruments

Streamlining environmental regulations

While Belgian authorities rely to some extent on economic and voluntary instruments to reach environmental objectives, regulation continues to provide the overarching framework. *Streamlining environmental regulation* has become necessary, as Belgian industry complains about the volume and complexity of the many regulatory texts, especially for small and medium-sized companies.

In *Flanders*, the regional government aims at simplifying regulation in general, including environmental regulation. Since 2005, *regulatory impact assessment* (RIA) has contributed to this aim. Several environmental regulations have so far been subjected to RIA, with simplified cost-benefit analyses. Since 2005 any new environmental legislation must be clear, coherent and streamlined (principle of "legal certainty"), so as to facilitate implementation and enforcement. Key parts of Flemish environmental legislation (concerning enforcement and liability) are being revisited before their inclusion in the Decree on General Provisions of Environmental Policy (1995), thereby working towards a form of codification. In *Wallonia*, the Walloon Environmental Code, released in 2005, clarifies and assembles environmental legislation. Its Book I contains general provisions regarding access to information, sustainable development, environmental education, environmental impact assessment and implementation of international conventions. Book II is the Water Code.

Table 4.7 **Performance in meeting selected environmental objectives, Flanders**

Air	
Potentially acidifying emissions	⇑[a]
Acidifying deposition	⇓[b]
VOC emissions	⇑
Ozone concentration (8-hour average)	⇔[c]
Ozone excess (annual)	⇑
PM emissions (PM_{10})	⇔
PM_{10} concentration (annual average)	⇔
PM_{10} concentration (daily average)	⇓
Benzene and toluene concentrations	⇑
PAH emissions	⇔
Dioxin deposition	⇑
Heavy metal emissions into the air	⇔
ODS emissions	⇑
GHG emissions	⇓
Water	
Surface water quality	
Nitrates, phosphates, oxygen	⇔
Biotic index	⇔
Heavy metals	⇔
Coastal bathing water quality	⇔
Nutrient pollutant load from agriculture	⇔
Pesticide use	⇑
Pesticide concentration in surface water	⇓
Pesticides in sediments	⇔
PCB in sediments	⇔
Heavy metal discharges into surface water	⇔
Waste	
Household waste collection	⇑
Household waste processing	⇑
Industrial waste volume	⇔
Industrial waste processing	⇔
Remediation of contaminated sites	⇑
Biodiversity	
Coverage of protected areas	⇓
Average size of nature reserves	⇔
Fragmentation of the open space	⇓

a) ⇑ Positive trend with achievable target.
b) ⇓ Negative trend, far from target.
c) ⇔ Trend either unclear or positive but insufficient to reach target.
Source: VMM, MIRA-T 2005 environmental indicators, 2005; OVAM.

Table 4.8 **Performance in meeting selected environmental objectives, Wallonia**

	State[a]	Trend[b]	EU directive
Air			
SO_2 concentration	1	1	99/30/EC
NO_2 concentration	1	2	99/30/EC
Emissions of acidifying substances	3	2	01/81/EC
Tropospheric ozone concentration	3	3	02/3/EC
PM_{10} limit values	3	. .	99/30/EC
Lead concentration	1	1	04/107/EC
GHG emissions (Kyoto commitment)	1	2	
Water			
Surface water pollution/eutrophication			
Scheldt	3	1	00/60/EC
Meuse	1	2	00/60/EC
Groundwater contamination			
Nitrates	3	3	91/676/EC
Atrazine	3	1	
Herbicides for uses other than agriculture	2	3	
Pollution load from urban and industrial sewage	. .	1	
Urban sewerage and sewage treatment	3	1	91/271/EC
Public water consumption	1	1	
Groundwater withdrawal	2	2	
Waste			
Household waste generation	1	1	
Household waste collection	2	1	
Household waste disposal	3	2	
Industrial waste generation	2	1	
Industrial waste valorisation	1	2	
Sewage sludge valorisation	3	3	
Biodiversity			
Wild ungulate populations	2	3	
Day butterfly populations	3	3	
Strict protection of environmentally sensitive areas	2	1	
Natura 2000 sites designation	. .	2	79/409/EC and 92/43/EC

a) State: 1 = good; 2 = average; 3 = bad.
b) Trend: 1 = improvement; 2 = status quo/insufficient to meet objectives; 3 = deterioration.
Source: DGRNE, Walloon Environment Dashboard 2005.

Environmental licensing

The issuing of environmental licenses to enterprises is done by regions, provinces and municipalities. The licensing authority depends on the size and type of industry, with the general rule that municipalities handle smaller companies and

provinces and regions larger ones, except in the Walloon Region where municipalities have the responsibility regardless of the size of the company (without precluding the company from seeking any remedies from the region). The trend has been towards *simplification of the permits and permitting procedures*. Progress has been made in fulfilling the OECD 1998 recommendation to extend the single permit system. In *Flanders*, there have been some small amendments to the legislation on single

Table 4.9 **Performance in meeting selected environmental objectives, Brussels-Capital**

	State[a]	Trend[b]
Air		
SO_2 concentration	1	1
NO_2 concentration	2	3
Emissions of acidifying substances	2	2
Tropospheric ozone concentration	2	3
PM_{10} concentration	2	3
Lead concentration	1	1
GHG emissions (Kyoto commitment)	3	2
VOC emissions	2	2
Benzene concentration	1	1
PAH emissions	2	2
Water		
Surface water pollution	3	2
Pollution load from urban sewage	3	2
Urban sewerage and sewage treatment	3	2
Public water consumption	2	2
Waste		
Household waste generation	2	1
Household waste collection (and recycling)	2	2
Household waste disposal	2	2
Sewage sludge valorisation	2	1
Number of contaminated sites	2	2
Biodiversity		
Natura 2000 sites designation	2	1
Green and blue network	2	1
Unprotected natural habitats	2	3
Vertebrate species protection	1	1
Invertebrate species protection	3	3
Plant species protection	2	2

a) 1 = good; 2 = average; 3 = bad.
b) 1 = improvement; 2 = status quo; 3 = deterioration.
Source: IBGE-BIM, State of the Environment 2005.

environmental permitting (e.g. including in 1999 the groundwater permit in the environmental permit) in line with the EU Integrated Pollution Prevention and Control (IPPC) Directive. Further steps are being taken to integrate environmental licenses for firms in individual sectors. In *Wallonia*, a single permit system was introduced by legislation in 1999. A February 2005 Walloon decree aiming at simplifying governance includes provisions for further simplifying licensing. All IPPC permits have to be reviewed by 2007 to take account of better technologies. In the *Brussels-Capital Region*, urban development and environmental permits may be issued simultaneously upon request (single procedure). Licences for off-shore activities are issued by the *federal government*.

Industry complains, especially in Flanders, about environmental licensing requirements, which are seen as quite strict, and applicable to much smaller companies than in neighbouring countries. While large companies generally have resources to respond to environmental regulation, small companies often find themselves inadvertently in violation of environmental rules. Belgian employers' associations have responded by assembling a unit of environmental advisers to help *small and medium-sized enterprises* to improve their practices and adhere to environmental legislation.

Environmental inspection

Environmental inspectorates exist at both the federal and regional level. The federal inspection unit was reorganised in 2002, when it became an independent unit of the DG Environment (FPS for Health, Food Chain Safety and Environment). The unit has been continually strengthened. It has 22 inspectors and controllers, and six additional staff should be recruited soon. All recently hired staff has been empowered with the necessary legal rights. The federal inspectorate's areas of responsibility include dangerous substances, biocides and pesticides (as provided for in the 1998 Law on Product Norms), as well as the transit of waste products, in co-operation with other inspectorates (police, social inspection, customs). The regional inspectorates either operate directly or oversee inspections carried out by local governments. A large number of inspections are also carried out by the police, at both federal and local levels.

In *Flanders*, the number of full-time environmental inspectors has increased by 10% (from 81 in 1998 to 90 in 2004). This increase in resources does not quite match the increase in responsibilities.[17] In the *Brussels-Capital Region*, the number of inspectors has also increased, but not sufficiently to meet the needs associated with increased regulation and complaints. In *Wallonia*, the number of inspectors has actually *decreased* and with it the number of inspections, while the number of complaints has remained high. Efforts have been made to improve the quality and effectiveness of inspections, to focus on large polluters, and to hold regular consultations with prosecutors.

Overall, while the *quality and effectiveness of inspections* has improved in recent years, the 1998 OECD EPR recommendation on the strengthening of environmental inspectorates has been only partly carried out, given the *extended responsibilities* of these inspectorates.

Sanctions

At the *federal level*, of the 6 643 environmental inspections carried out in 2005, few led to warnings (21% for dangerous substances, 4% for biocides and pesticides, 0.4% for the transit of waste) (Table 4.10). Administrative sanctions started being implemented in 2006. The *number of environmental court cases is decreasing*. This can be interpreted as: i) a declining will by courts to take up cases involving infringement of environmental rules, ii) a greater emphasis on guiding companies rather than punishing them, and iii) a shift towards using administrative sanctions rather than judicial ones. An effort has been made to better educate judges and

Table 4.10 **Environmental inspections**

(number)

	Regular inspections	Official reports	Warnings	Other[a]
Federal				
2004				
Dangerous substances	839	–[b]	156	
Biocides and pesticides	3 765	20	479	
Waste transit	2 708	. .[c]	86	
2005				
Dangerous substances	913	–[b]	193	
Biocides and pesticides	1 919	8	86	
Waste transit	3 811	. .[c]	17	
Flanders				
1997	12 469	1 166	1 098	60
2003	11 605	751	1 627	139
Wallonia				
1998	2 734	236	2 438	32
2004	910	208	708	43

a) Federal: administrative sanctions to start in 2006; Flanders: administrative sanctions (129 in 2003) and administrative fines (10 in 2003), fines refer to the manure decree; Wallonia: closing-down notices.
b) No statutory staff.
c) In co-ordination with police and port police forces, customs, etc.
Source: Federal Public Service for Health, Food-Chain Safety and Environment; AMINAL; DGRNE.

magistrates on environmental law, and to promote consultation between inspectors and prosecutors to help clarify their division of labour. This should help insure that only the more serious cases are brought to court.

At the *regional level*, 6.5% of the 11 605 inspections carried out in Flanders in 2003 led to official reporting; 15% led to warnings or administrative sanctions (Table 4.10). The share and number of inspections leading to official reports decreased, while those leading to warnings and administrative sanctions increased. While most actions relate to water, those concerning air and waste have increased. A new Flemish decree (in preparation) aims to reduce the number of penalty cases and to replace most penal sanctions by administrative sanctions. In Wallonia, the share and number of inspections leading to warnings have decreased, while those leading to closing-down notices have increased (Table 4.10).

Economic analysis of environmental regulations

Regulatory impact assessments were introduced in Flanders in 2005 to evaluate the impact of new regulations. Such assessments provide a rough estimate of expected costs and benefits of different policy options. Also, to analyse the most cost-effective way to reach environmental objectives, policy measures are subject to an environmental costing model called MKM. The MKM has been used in air quality management, for example, to determine how best to implement the National Emission Ceilings Directive. Economic studies are ongoing or planned for odour emissions, the second climate plan, implementation of the EU Water Framework Directive, policy related to forests and parks, and environmental subsidies.

Green procurement

For several years, multiple initiatives have been taken by the different authorities (federal, regional, local) to gradually include "green criteria" in the public calls for tender. *New legislation has been* adopted and information campaigns have been organised to enhance the greening of public procurement.

6.4 Economic instruments

Belgium relies on economic instruments in many environmental fields at regional level (Tables 4.11, 4.12, 4.13) and at federal level, and there is a *slow trend towards their wider use*. The purpose of most environmental charges and taxes is to change behaviour and finance mitigating action (e.g. in line with the polluter pays and user pays principles).

Table 4.11 **Environmental charges, Flanders**

Charge	Unit	Charge rate[a] (EUR/unit)	Collected amount[b] (EUR million)	Use of revenues[c]
GENERAL				
Environmental permit charge[d]			0.5	MINA Fund
Category I firms subject to EIA	permit	247.89		
Other category I firms	permit	123.95		
Category II firms	permit	61.97		
WATER				
User charge (waste water treatment)[e]				
Drinking water			118	Water company
Sewerage	m^3	max. 1.0197[f]		
Sewage treatment	m^3	0.6798[f]		
Non-drinking water	pollution unit	min. 29[f]		Water sanitation company
Pollution charge	pollution unit[g]	28.61[f]	137	MINA Fund
Groundwater abstraction charge			11.5	MINA Fund
Drinking water companies	m^3	0.0814[f]		
Others				
Less than 500 m^3/year	m^3	Free		
500 to 30 000 m^3/year and non-artesian water	m^3	0.0543[f]		
More than 30 000 m^3/year and artesian water				
30 000 to 100 000 m^3/year	m^3	min. 0.0697[f, h]		
100 000 to 1 million m^3/year	m^3	0.075 to 0.150[f, h]		
More than 1 million m^3/year	m^3	0.147 to 0.297[f, h]		
Surface water abstraction charge			16	WenZ
Less than 500 m^3/year	m^3	Free		
500 to 1 million m^3/year	m^3	0.043381		
1 to 10 million m^3/year	m^3	0.025161		
10 to 100 million m^3/year	m^3	0.012643		
More than 100 million m^3/year	m^3	0.002380		
Gravel extraction charge			2.3	Gravel Fund
Valley	m^3	0.56		
Mountain	m^3	0.39		
WASTE[i]				
User charge (waste collection and disposal)			. .	Municipalities
Residual and organic waste	bag (60 litres)[j]	1.14[k]		
Packaging waste[l]	bag	0.125 or 0.25[m]		
Flat charge	family/year	59.55 or 82.95[n]		
Disposal tax			38	MINA Fund
Landfilling	tonne	0.32 to 123.63[o]		
Incineration	tonne	6.8 to 61.82[o]		
Co-incineration	tonne	3.75 to 4.99		

Table 4.11 **Environmental charges, Flanders** *(cont.)*

Charge	Unit	Charge rate[a] (EUR/unit)	Collected amount[b] (EUR million)	Use of revenues[c]
Manure charge[p]			10	MINA Fund
Basic charge on manure production	kg N and P	0.0111		
Basic charge on fertiliser use	kg N and P	0.0223		
Fine on incorrect application or disposal	Kg N and P	1.00		
Surcharge on excess[q] or fine[r]	kg N and P	0.99		
Import tariff	tonne	2.4789		
Soil attestation charge[s]	parcel	25	4.4	OVAM
NATURE CONSERVATION				
Hunting license	person/year	40 to 150[t]	2	Agency for Nature and Forests
Fishing license	person/year	75	0.8	Agency for Nature and Forests
Contribution for forest conservation[u]			2.5	Agency for Nature and Forests
Indigenous hardwood	m^2	3.96		
Mixed forest	m^2	2.97		
Non-indigenous hardwood	m^2	1.98		

a) Rates as of 1 January 2005, unless otherwise indicated.
b) In 2005.
c) MINA Fund: Environment and Nature Fund (revenues contribute to the financing of Flemish environmental policy); Wenz (Waterwegen en zeekanaal): public body in charge of the Flanders inland navigable waterways and sea-canal (from Brussels to the Scheldt); OVAM: Public Waste Agency of Flanders.
d) Industrial activities are regrouped in three categories according to their likely impact on the environment (Category I: strong; Category II: harmful; Category III: limited).
e) User charges for waste water treatment were established in 2005.
f) Rates as of 1 January 2006.
g) For households, proportional to water consumption. For industry, based on measured concentration or conversion coefficients for organic matter and suspended solids, heavy metals, nutrients (N and P) and cooling water.
h) The rate increases with water scarcity of the aquifer.
i) Product charges (so-called "ecotaxes") and pesticide tax are under federal authority.
j) Some municipalities use containers with charge based on volume or weight.
k) On average (each municipality sets its own rate). Rate in 2003.
l) Plastic bottles, metals, drinking cardboard.
m) The rate varies according to municipalities.
n) Depending on whether the charge is specific to waste (EUR 59.55) or if it covers broader environmental management (EUR 82.95).
o) The rate varies according to the type of waste.
p) Levied on farmers.
q) Above the allowed amount.
r) For non-compliance with processing or export requirements.
s) Established in 1996, the charge applies to land cessions. The aim is to follow up on ownership of contaminated soils.
t) The rate varies according to the type of license (normal, Sunday-only, five-day).
u) Charge per m^2 of deforested area in case of non-fulfilment of reforestation obligations.
Source: Flemish authorities.

Table 4.12 **Environmental charges, Wallonia**

Charge	Unit	Charge rate[a] (EUR/unit)	Collected amount[b] (EUR million)	Use of revenues[c]
TERWA				
User charge (sewage treatment)			38.4	Water company
Households	m^3 water consumption	0.5542[d]		
Agriculture (domestic sewage)	m^3 water consumption	0.3966[e]		
Pollution charge			10	WPF
Industry	pollution unit[f]	8.9242		
Agriculture (livestock effluents)	pollution unit[f]	8.9242		
Groundwater abstraction charge			3.6	WPF
Less than 3 000 m^3/year	m^3	Free		
3 000 to 20 000 m^3/year	m^3	0.0248		
20 000 to 100 000 m^3/year	m^3	0.0496		
More than 100 000 m^3/year	m^3	0.0744		
Potable water abstraction charge	m^3	0.0744	0.5	WPF
WASTE[g]				
User charge (waste collection and disposal)	Bag[h]	. .[i]	. .	Waste company

a) Rates as of 1 January 2005, unless otherwise indicated.
b) In 2005.
c) WPF: Water Protection Fund.
d) Since 2005, free for households connected to public water supply.
e) In the absence of metering: 100 m^3 per year per household plus water consumption by livestock (estimated at 1.8 m^3 per pollution unit).
f) Based on measured concentration or conversion coefficients for organic matter and suspended solids, heavy metals, nutrients (N and P) and cooling water. There are coefficients to convert livestock units into pollution units equivalent.
g) Product charges (so-called "ecotaxes") and pesticide tax are under federal authority.
h) 70% of municipalities charge per bag. Some municipalities use containers with a flat rate charge plus charge based on volume or weight.
i) The rate varies according to municipalities.
Source: Walloon authorities.

Air

Belgium has no economic instruments to directly address *traditional air pollution* but instead applies sanctions when air emissions surpass permitted levels. The efficiency of this approach should be compared with the use of economic instruments such as emission charges or emission trading. With standards, all firms must comply equally while their costs per unit of emission reduction vary. In contrast, emission trading (where feasible) assures that the environmental target will be met, and pollution abatement takes place where most efficient. Emission charges can both

generate revenues commensurate with the external costs imposed by the emissions and provide incentives for reducing emissions, provided the rates are appropriate.

The EU *Emission Trading Scheme* addresses *greenhouse gases* and is well in place in Belgium. It will bring multiple benefits not only in terms of reducing greenhouse gases but also in reducing traditional air pollutants and providing energy savings. A *green certificate market* was adopted in Belgium to provide "green" electricity.

Water charges

Water charges are a main source of revenue for the regions, after transportation taxes. They consist of pollution charges, user charges and abstraction charges. In Flanders, until recently households and industry were subject to *pollution charges* at the same rate per pollution unit. Over the review period (until 2004), the rate was not increased in real terms but adjusted for inflation only. In volume, charges paid by industry have decreased annually, reflecting efforts made by firms to reduce their waste water discharges, whereas charges paid by households have remained virtually unchanged, reflecting stability in water consumption (as for households, pollution charges are proportional to water consumption).

Table 4.13 **Environmental charges, Brussels-Capital**

Charge	Unit	Charge rate[a] (EUR/unit)	Collected amount[b] (EUR million)	Use of revenues
WATER				
User charge (sewage treatment)	m^3	0.3471	. .	Water company
Pollution charge	pollution unit[c]	. .	21 (2002)	Water Fund
WASTE[d]				
User charge (waste collection and disposal)		Free[e]		

a) Rates as of 1 January 2005, unless otherwise indicated.
b) In 2005, unless otherwise indicated.
c) Based on a fixed pollution load for households. For industry, measured concentration or conversion coefficients for organic matter and suspended solids, heavy metals and nutrients (N and P).
d) Product charges (so-called "ecotaxes") and pesticide tax are under federal authority.
e) Municipal waste management is financed by the (broad) regional tax levied on households.
Source: Authorities from the Brussels-Capital Region.

Since 1 January 2005, water companies have been made responsible for sanitation of the drinking water they supply, and users of tap water (households, industry and agriculture) have been charged a combined water bill (public water supply and waste water treatment) to raise awareness about water prices. *User charges for waste water treatment* consist of a municipal charge for sewage collection (sewerage) and a supplement for sewage treatment. For households, the supplement replaces the pollution charge, except in the case of groundwater extraction. For industry and agriculture, the supplement is deducted from the pollution charge. In the case of non-drinking water, Flemish industries that discharge into municipal sewers are subject to user charges for waste water treatment that can also be deducted from pollution charges. Industries that discharge directly into water bodies continue to pay pollution charges only. User charges (for waste water treatment) and pollution charges should not be mutually exclusive. The latter apply the polluter pays principle while the former aim at cost recovery of sewage treatment services. User charges for waste water treatment have been set at higher rates in Flanders than in Wallonia, and rates in Brussels-Capital are the lowest.

Up to 2002, the rates for groundwater extraction in Flanders were too low to provide an incentive for reducing water use or substituting surface water for ground water (in some cases, the rates were significantly lower than those for the withdrawal of surface water). Groundwater *abstraction charge* rates have since been increased, and conservation pricing (increasing-block schedule) has been applied to withdrawals above 30 000 m^3/year or from artesian water. For these withdrawals, the charge is intended to aim at rent recovery and thus varies according to water scarcity (location of the aquifer, water table level). Reductions to the groundwater charge allocated to some sectors were abolished in 2002, and since 2005 charge rates have been increased by 50 to 100% (depending on water scarcity) for the two aquifers of Landiaan and Sokkel. A *gravel extraction charge* also applies in Flanders. The aim is to protect habitats (gravel banks/gravel islands) and wetlands (threatened by the lowering of the river and the associated groundwater level).

Waste related charges and taxes

Charges on waste are also a main source of income for the regions, though after water charges. These consist of *user charges*, *product charges* and, in the Flanders Region, *manure charges* (Box 4.6). Fiscal measures also apply to waste management, in the form of a *disposal tax (landfill, incineration, co-incineration)* and *pesticide tax*. These instruments have been environmentally effective overall, but their design could often be improved to also achieve economic efficiency.

In Flanders, for instance, most municipalities apply *user charges* (for waste collection and disposal) based on volume or weight (through the use of plastic bags or

Box 4.6 **Manure management in Flanders: towards a manure rights trading system?**

A *manure charge* has been levied in Flanders since 1991. It was introduced at the time of the enactment of the EU Nitrates Directive, and as part of the first manure decree. It was based on maximum application limits and manure transport from farms with surplus manure to other farms. In 1995, a first manure action plan (MAP1) made manure application standards more stringent, required designation of vulnerable zones, and put an end to the increase in the number of livestock (through environmental permitting). MAP1 introduced a levy for non-compliance with manure application standards.

As MAP1 did not yield the expected results, a second *manure action plan* (MAP2) was launched in 1999, based on the "three-pillar policy": i) reducing sources (e.g. through livestock decrease,[a] feed improvement); ii) substituting mineral fertiliser for manure or improving the manure nutrient (N, P) content; and iii) exporting the manure surplus or processing it into marketable products. Since then, a surcharge has been imposed on manure application surpluses and for non-compliance with manure processing or export requirements. MAP2 has proved more successful than MAP1 in reducing the manure surplus.[b] However, the effect of the manure charge on farmers' behaviour has not been significant (as it was set at a very low rate), while the effect of the manure surcharge has also been limited (given its complex calculation method). Most of the progress since 1999 is due to the first pillar (i.e. use of better feedstuffs and incentives to reduce the number of animals). The contributions of the second and third pillars proved lower than originally planned, due to difficulty in substituting manure for inorganic fertiliser and in finding export markets,[c] and the high costs of processing techniques (Vervaet *et al.,* 2005).[d]

The share of samples in Flemish watercourses with nitrate concentrations above 50 mg/litre decreased from 59% in 1999/2000 to 32% in 2002/03, but rose again to 41% in 2004/05. To implement the EU Nitrates Directive, *vulnerable areas* were increased from 15% of the Flemish territory in 2002 to 50% by the end of 2005. As of 2007, the whole of Flanders will be designated as a vulnerable area, as is the case for Denmark and the Netherlands. As this would result in the manure surplus in Flanders increasing from 18 000 tonnes back to 32 000 tonnes of nitrogen equivalent, Flanders is seeking a derogation (from the EU Nitrates Committee) from the 170 kg/ha limit on livestock manure, subject to stricter enforcement of the Nitrates Directive.

A third manure action plan (MAP3) is being prepared. It proposes to introduce *tradable manure rights* (so-called "nutrient-emission rights"). Each cattle farmer would be given manure rights (expressed as a number of animals). These rights would be negotiable: a farmer who wants to increase his or her herd would need to buy manure rights from another who is willing to scale down or stop. In each transaction some of the rights would be ceded to the government so as to reduce the total manure surplus along with structural adjustment. The manure rights would replace the "nutrient content" (a complex manure production right expressed in kilogrammes) as the basis for the manure surcharge. The Flemish government wants to reform the rules concerning the compulsory processing of manure. The role of the Manure Bank (Mestbank), operating since 1991, is also being reviewed.

Box 4.6 **Manure management in Flanders: towards a manure rights trading system?** *(cont.)*

Overall, *efficiency criteria* should be used in seeking to meet the requirements of the EU Nitrates Directive (i.e. that all Flemish watercourses contain less than 50 mg of nitrates per litre), with an appropriate mix of instruments including: stricter regulatory measures (e.g. manure application standards across all of Flanders), increased reliance on charges (e.g. higher rates of manure charges), and introduction of trading mechanisms (tradable manure rights). Levying surcharges on excess manure may lead to a complex accounting system, as experienced in the Netherlands, where such a policy has recently been ceased. Animal quotas, as planned, seem much better suited to trade than manure contract systems.

a) Sometimes supported by buy-out payments.
b) Compulsory processing of manure was decreased from 36 000 tonnes of nitrogen equivalent in 1999 to 18 000 tonnes in 2003. The 1991 Manure Law was revised in 2003 and processing obligations lowered to 15 000 tonnes.
c) Manure exports to the Walloon region are not allowed by Walloon legislation.
d) Flanders is seeking EU support for investments in manure processing infrastructure, possibly combined with generation of bio-gas.

containers). In some municipalities, a flat charge is still levied on each family (specific to waste management or with a broader environmental coverage). Even if they facilitate cost recovery, such flat charges do not create incentives to minimise waste. Instead, user charges should be set at rates that allow cost recovery. Municipalities sell blue bags for small packaging waste (plastic bottles, metals, cardboard beverage boxes) at a much cheaper rate than the bags used for unsorted household waste, to encourage separate collection. For collection and disposal of bulky waste, municipalities charge per volume or per piece of waste. The collection and/or bringing of paper, cardboard, glass, waste electrical and electronic equipment (WEEE) and small hazardous household waste is free. Municipalities have started to charge for access to bring centres (bulky, garden or demolition waste), at a flat rate or per volume or weight.

Implemented since 1996 at the federal level, *product charges* (so-called "ecotaxes") initially applied to batteries, beverage containers, disposable razors (introduced but subsequently withdrawn) and disposable cameras, as well as to packaging of certain industrial goods (e.g. inks, glues, solvents, pesticides), magazine papers and newspapers, and pesticides.[18] As the system became unduly complicated,

a number of charges (e.g. on beverage cans) were redesigned along simpler lines. A uniform charge was introduced on all drink containers that cannot be re-used or do not consist of a high percentage of recycled material. High charge rates have led to a substantial decline in the use of these products (in the case of disposable razors, sales fell to zero). An *exemption from the charge* is allowed if a certain recycling rate is met.[19] This charge-exempt recycling target has been made more stringent with time: for beverage containers, from 20% in 1996 to 70% in 2000; for batteries, from 60% in 2002 to 65% in 2005; for packaging of industrial products, from 40% in 1996 to 85% in 2005. The required recycling rate for disposable cameras is 80%. Since 2004, all non-reusable beverage containers have been subject to the charge. There was an attempt to increase the charge on beverage containers at the beginning of 2005, but it was cancelled six months later, as it reportedly had the undesired side effect of increasing cross-border shopping.

The product charges generate revenues to the federal government (EUR 0.8 million in 2003), which are lower than the costs of collecting them. Since their purpose is to induce reuse or recycling, the charges should be evaluated by reviewing the resulting *environmental benefits*, the costs incurred in setting up and running the schemes, and any changes in *consumer surplus* from induced changes in consumption patterns. The scheme, which initially aimed at reorienting consumption away from packaging-intensive products and reducing the generation of packaging waste, was transformed into an instrument to promote recycling. Whereas Belgium has sharply increased recycling rates, these achievements seem to have come at significant cost to society. Indeed, the setting of recycling targets should be based on economic analysis. One study suggests the optimal recycling rate is between 45 and 70% (OECD, 2003a).

The *pesticide ecotax* has never been implemented for agriculture. In 1996 the number of pesticide tax rates was reduced from three to two (EUR 0.05 and EUR 0.25/g of active ingredient), with the higher rate applying to the most toxic substances (diuron, atropine, isoproturon, pentachlorophenol, simazine). Since 1998, however, a *federal pesticide tax* has applied to pesticides bought for agricultural use. The tax applies to the same five active substances as the pesticide ecotax, but its main purpose is to finance the registration of active ingredients pursuant to the Plant Protection Products Directive (91/414/EC) and the federal programme to reduce agricultural pesticides and biocides. Revenues (EUR 250 000 per year) accrue to the fund for raw materials and products. Marketing authorisation holders pay the tax on the basis of several criteria (health and environmental effects, flammability). The extremely low rate planned in 1998 (EUR 0.0025/g of active ingredient) had insured wide acceptance from the farming sector, since farmers were better off than with an extension of the higher ecotax for agricultural use (Ecotec, 2001). The rate has since

been increased (up to EUR 0.395/kg or litre of pesticide) to create incentives for industry to produce safer products and for consumers to buy them (the amount of the tax appears on the invoice). However, the rate is still too low (and is not expected) to have a significant effect on pesticide sales.

Forest payments

Since 1991, private forest owners in Flanders have been entitled to a *forest plantation payment* for afforestation or reforestation, based on acreage and with higher rates for indigenous trees. Financial incentives are also provided for opening private forests to the public and for preparing large-scale forest management plans (i.e. together with adjacent properties). It would be better if such payments were based on the provision of environmental services (e.g. improvement of water quality, creation of biodiversity corridors). Since 1999, any deforestation must be licensed and compensated either by planting trees on a surface that was not previously forested of at least the same size or by making a *compensation payment* to the forest administration (for the buying and afforestation of land). This measure provides for maintaining the forest cover but does not prevent the conversion of old growth forests (of high biodiversity value) into young plantations (with higher carbon sequestration). As for plantation payments, compensation payments should reflect environmental externalities.

In *Wallonia*, forest plantation (and management) payments are conditional upon compliance with good forest practices (e.g. species suited to the plantation site, mixed plantation forests, absence of drainage, early thinning). Both private and public forest owners are eligible. Since September 2006, participation in a forest certification scheme has been added to the eligibility criteria for conifer planting (from 1 January 2008 it will also apply to broadleaf regeneration).

Land cessions

In Flanders, a soil investigation must be carried out before any land on which an activity with high potential for soil contamination is or has been carried out can be transferred. If there is evidence of contamination, the transfer cannot take place until i) a remediation plan is worked out, ii) the buyer or seller (the party) commits itself to undertake the remediation work after the transfer, and iii) the Public Waste Agency of Flanders (OVAM) is provided with enough financial guarantee to cover the remediation cost. In case of non-compliance, the OVAM can substitute itself to the defaulting party and use the financial guarantee to carry out the remediation. This mechanism has proved very effective in triggering the *clean-up of contaminated soils* while integrating remediation costs in the price of land.

More generally, any land cession requires a "*soil attestation*" from the OVAM. It provides the buyer with a summary of all information available in the register of contaminated land. Revenues of the soil attestation charge (EUR 25) cover the operation of the scheme.

6.5 Role of the private sector

Environmental certification

There has been a *large increase in environmental certification* of Belgian industries in recent years. By the end of 2003, more than 300 Belgian enterprises were ISO 14001 certified (two-thirds of them since 2000). In March 2005, 33 organisations and 179 sites were registered with EMAS (the Eco-Management and Audit Scheme of the EU).[20] In the *Brussels-Capital Region*, environmental authorities have certified 98 companies that develop internal environmental plans that help them to comply with regulation. This certification scheme, the "eco-dynamic enterprise" label, has drawn interest from some other European countries.

Agreements with industry

The SO_2 and NO_x emission reduction objectives set by the 1991 *sector agreement between Belgian electric power plants and the three regional authorities* (to reduce SO_x levels by at least 80% compared to 1980 levels, and NO_x levels by at least 40%) were met by the end of 2003: SO_2 emissions were 90% lower than their 1980 level, and NO_x emissions were 60% lower. Electricity companies also met their commitment not to use coal with sulphur content above 1%. The 1998 federal Law on Product Standards allows for sectoral agreements between federal authorities and industry; however, no such agreements have been signed at the federal level. In *Flanders*, 12 agreements have been signed since 1998 between Flemish authorities and industry. Two relate to soil clean-up, one to NO_x emissions from electricity production, and nine to waste management. Nearly all producer responsibility concerning waste is being implemented through such agreements which have a basis in Flemish legislation. In *Wallonia*, 12 agreements were signed (in 2003 and 2004 alone) with firms in the chemical industry, cement production, paper industry, food production and other fields. Two types of environmental conventions exist in Wallonia: industrial sector agreements and waste reduction and recycling obligations. In the Brussels-Capital Region, one agreement was signed with industry in recent years.

Regional authorities in both Flanders and Wallonia have signed agreements with industry on *energy efficiency* as part of their climate change policy (Box 4.2). In Flanders, by late 2004, about 180 companies had signed benchmarking agreements applying to large energy-intensive companies or companies falling under the EU

Emission Trading System. There is also an audit covenant applying to 229 medium-sized companies. In Wallonia, agreements are signed by sector, and commit the sector to a quantified energy efficiency improvement over the period 2000-12. Agreements signed cover 117 energy intensive firms and more than 90% of the region's industrial energy consumption.

In the three regions, producer responsibility has applied to packaging waste since 1995, and is implemented through agreements. *Extended producer responsibility* (EPR) has been established for a number of waste streams in recent years (e.g. photo-processing chemicals, organic agricultural waste, waste oil, waste fat and oil from baking) in addition to waste streams already covered (e.g. pharmaceutical waste, paper, old tyres, batteries, and waste electrical and electronic equipment). There is also a take-back obligation for end-of-life vehicles, accumulators and agricultural plastic waste. An in-depth evaluation of the effectiveness and efficiency of producer responsibility schemes is under way. Under the scheme, producers and importers must fulfil a recycling/recovery target through a take-back programme operated either directly by themselves or by a sub-contractor. Placing responsibility for waste management with producers creates a strong incentive for them to redesign products with less material input and improved recyclability. However, if individual producers become responsible for collection, sorting, and recovery or disposal of their own products, there will be a tendency towards a fragmented waste management system, losing the benefits of economies of scale and synergies between different treatment options enjoyed by integrated systems. To increase environmental effectiveness and economic efficiency, EPR schemes should involve product charges, designed both to minimise at source the production of environmentally harmful products and to finance safe disposal, recycling or reuse.

Economic instruments are sometimes used in conjunction with agreements with industry. An example is an agreement signed between the three regional environmental authorities and petrol stations to finance the *clean-up of contaminated soils* affected by leakages. A special fund (called BOFAS Fund) for remediation of soil and groundwater is financed by the petrol station owners (50%) and by a small charge on fuel (50%). The charge was established in 2004 at 0.30 eurocent per litre of petrol and 0.20 eurocent per litre of diesel. The fund contributes to clean-up operations up to a limit: EUR 37 200 if either soil or groundwater needs remediation, and EUR 62 000 if both soil and groundwater need remediation. Similar financing models are being considered to clean up pollution from storage tanks for fuel oil, and from dry-cleaning facilities. In 2006, Flanders decided that specific funds could be created to help small and medium-sized enterprises carry out the clean-up of contaminated soils. While looking for possible sources of financing, funding will be from the general Flemish budget.

Overall, Belgian federal authorities, regional authorities and industry look quite favourably upon *partnerships and agreements with industry* as a flexible and effective way to reach targets. The nature and scope of the agreements vary, depending on environmental issues and regions. Many studies have shown that voluntary approaches, to be effective, must be accompanied by monitoring mechanisms to assure accountability and facilitate evaluation. Voluntary measures are an important component of the instrument mix, but should not automatically be chosen over regulations or economic instruments when these would be more cost-effective.

Product labelling

The *federal government* is active in promoting (and awarding) the EU eco-label,[21] the Flower, within Belgium. The EU eco-label has a clear objective of encouraging business to market "greener" products. The number of eco-labelled products on the Belgian market increased from 31 in 2003 to 76 in 2006. The consumption of organic food products is increasing (from EUR 62 million in 1997 to EUR 315 million in 2004).

Product standards

Since 1997, *Belgian standardisation policy* has been reviewed to meet the needs of industry more effectively while seeking better protection of the environment. The 2003 Standardisation Act and its implementing decrees have concluded this process. The main idea behind the act, which took full effect in 2005, is to allow the players directly involved in standardisation to take a more active, more structured role in the drafting of standards or their discussion at European (CEN) or international (ISO) level. This led to the setting up of the Higher Council for Standardisation. The Standardisation Office (NBN), which recently took over from the former Belgian Standardisation Institute (IBN), brings together public authorities (federal environmental authorities are member of the Administrative Board) and industry as well as civil society, in so far as standards concern the protection of the environment, consumers and workers.

6.6 Other instruments

Land-use planning

In a densely populated country like Belgium, land-use planning is an important instrument to deal with urban sprawl and its side effects, such as loss of natural habitats, increased stress on water and increased emissions of air pollutants from transport. The 1998 OECD review recommended that environmental concerns be better integrated into all physical and land-use planning. Some progress has been reported in legislation

and policy-making in recent years at the *regional level*. In Wallonia, a new code for land-use planning, urbanisation and historical heritage, adopted in 1998, has as one of its aims to integrate environmental concerns and sustainable development into land-use plans. The Brussels-Capital Region has a policy objective of increasing nature areas not only to enhance biodiversity but also to attract middle-class families who value green areas in their neighbourhood. In Flanders, while land-use planning is not a responsibility of environmental authorities, environmental concerns have been integrated into urban value and agricultural land-use policies.

While progress was thus made during the review period in further integrating environmental objectives into land-use planning at the regional level, it is difficult to see concrete positive results of this in the *actual development of land use*. The rate of land being built up has remained fairly constant for a long time. Open space has decreased, fragmentation of habitats has increased, and land cover analysis shows densification in the already heavily populated north. As practical land-use planning lies mostly with municipalities, it is difficult to ensure that the sum of many municipal spatial plans conforms to general policy orientations, even if municipal plans have to be approved by higher authorities.

The federal government, which is not involved in land-use planning, has developed a *plan on the use of Belgian waters* in the North Sea, involving relevant stakeholders.

Environmental impact assessment

Environmental impact assessment (EIA) is *for the most part carried out by the three regions*. In Wallonia, 424 projects were subject to EIA during 1998-2004, while in Flanders approximately 380 projects were submitted for EIA during 1999-2004. The list of activities subject to EIA has been extended in recent years, in line with European legislation. Although detailed quantitative information on the effect of EIAs is lacking, most EIAs have led to some change in the original project proposal, and a few have led to withdrawal or relocation of the project. *Federal authorities* are in charge of EIA of nuclear and off-shore facilities. Four off-shore wind farm projects have been subject to EIA since 1998: one received authorisation for construction in 2004.

6.7 Pollution abatement and control expenditure

Over the period 1996-2002, total expenditure on pollution abatement and control (PAC) *grew significantly* as a result of its increasing share of GDP (at around 1.7% of GDP in 2002) and of the increase of GDP itself (Table 4.14). This is mainly the result of a doubling of both waste and waste water related services provided by specialised

producers. In 2002, private (business) PAC expenditure amounted to somewhat more than 0.6% of GDP. Expenditure on waste and waste water represents the major part of total public expenditure (Service Public Fédéral (SPF) Économie, PME, Classes Moyennes et Énergie, 2005).

Table 4.14 **Pollution abatement and control expenditure**[a]

	1996		2002	
	Total (EUR million)	Investment (%)	Total (EUR million)	Investment (%)
Public sector				
Waste water/soil/groundwater	427	*76*	508	*66*
Waste	463	*4*	668	*16*
Air	8	*1*	10	*0*
Others[b]	135	*4*	163	*12*
Total	1 033 *(0.5% of GDP)*	*34*	1 349 *(0.5% of DGP)*	*34*
Business sector				
Waste water/soil/groundwater	366	*31*	550	*14*
Waste	449	*12*	508	*5*
Air	227	*63*	245	*20*
Others[c]	196	*6*	231	*16*
Total	1 238 *(0.6% of GDP)*	*26*	1 535 *(0.6% of GDP)*	*13*
Private specialised producers				
Waste water	247	*43*	648	*23*
Waste	755	*14*	1 426	*4*
Total	1 002 *(0.5% of GDP)*		2 074 *(0.8% of GDP)*	
Public specialised producers				
Waste water	53	*16*	159	*5*
Waste	675	*18*	1 078	*3*
Total	729 *(0.4% of GDP)*		1 237 *(0.5% of GDP)*	

a) Investment and total current expenditures. Specialised producers: excludes receipts from by-products.
b) 2ncludes noise; excludes water supply, biodiversity and landscape protection.
c) Part of specialised producers' expenditure are financed by money from transfers from the public sector (e.g. local authorities), which adds to charges paid directly to them by service users.
Source: Belgian authorities.

Notes

1. Similarly, the regional governments have established regional councils on sustainable development.
2. On request from government members, or on its own initiative, the FCSD can also provide advice on specific issues.
3. Co-operation agreement between the Flemish Government and local authorities, Jan Verheeke, October 2005.
4. The revenues of the fee (paid by employers) are used to fund social security.
5. Today, only lorries (domestic and foreign) weighing 12 or more tonnes pay a fixed annual charge (the eurovignette) for the use of Belgian motorways.
6. Communication from Belgian authorities.
7. Communication from Belgian authorities.
8. Communication from Belgian authorities.
9. The objective of the Lisbon Strategy is "to deliver stronger, lasting growth and create more and better jobs". The original goals emerged from the Lisbon European Council summit of March 2000, and the target date for achieving them was set at 2010.
10. The federal-regional consultation cell on all energy matters.
11. The conditions that have to be met in order to be considered a "protected residential customer with modest revenue or in a precarious situation" are defined in two 2003 ministerial decrees (for the electricity market and for the natural gas market).
12. In 2004 the federal government made a commitment to compensate 4.8 Mt of CO_2 equivalent/ year during the 2008-12 period.
13. The regions can also make use of Kyoto's flexibility mechanisms.
14. 58.3 million allowances were allocated in 2005.
15. The regions participate on a voluntary basis in the drafting and implementation of the Federal Sustainable Development Plan.
16. A sort of "internal treaty", sometimes submitted for parliamentary assent.
17. The tasks of the Flemish Environmental Inspection Section have been broadened since 1998, in response to various new laws.
18. Paper and packaging were charged by weight or by volume, and pesticides according to toxicity. The major pesticide user, agriculture, was exempted.
19. Producers and distributors of batteries and disposable cameras are charge-exempt if they provide facilities for collecting and recycling the product. In 2003, charges on paper were repealed, as recycling rates had been achieved.
20. Pursuant to Regulation (EC) 761/2001 of the European Parliament and of the Council, the scope of EMAS was extended beyond industry to all economic sectors, including public and private services.
21. Belgium is among the nine EU participating countries.

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5 ENVIRONMENTAL-SOCIAL INTERFACE*

Features

- Social context
- Information and participation
- Environment and employment
- Right to water and social tariffs
- Environmental education

* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental Performance Review of 1998. It also reviews progress with respect to the objectives of the 2001 OECD Environmental Strategy.

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the environmental performance review of Belgium:

- continue to improve *access for all to environmental information*, and improve the *comparability* of information among regions;
- increase citizens' *access to justice* in environmental matters;
- implement the user-pays principle for environmental services (water, waste) while continuing to give access to these services to *the poor*; consider extending fiscal incentives for energy-saving building insulation;
- continue to develop *environmental education*, particularly at higher education levels;
- continue to *develop partnerships with NGOs* and further involve local volunteers in managing protected areas, including in densely populated areas;
- further analyse the impacts of environmental policy on *employment in Belgium*.

Conclusions

Innovative pricing and financing instruments now help ensure *access for all to essential environmental services* such as water services. Water pricing differentiates between (low-priced) essential uses and (high-priced) luxury uses. Belgium can be considered to be fully implementing the *right to water* in its internal legislation. People in need will not be disconnected and the price of water will be affordable to poor households. Wallonia will introduce a tax on billed public water supply to finance development assistance in the water sector. Concerning *environmental information*, environmental data collection and publication improved substantially at regional and federal levels, leading to high quality *environmental reporting*, to more evidence-based and outcome-oriented environmental governance, and to performance-oriented planning. Concerning *environmental awareness* and related action, much has been done at federal, regional, community and local levels, including: communication campaigns, financial transfers to local authorities, voluntary regional-municipal covenants, and support for innovative waste prevention and eco-consumption projects. The voluntary regional-municipal covenants are particularly innovative. Several *partnerships* with private enterprises, trade unions, local authorities and environmental NGOs have succeeded in improving environmental management. Environmental work by NGOs has often received

government financial support. Directly or indirectly, the environmental sector contributes to *employment* in Belgium, and related jobs increased by about 10% over the review period.

However, *access to environmental information* is hindered by being so widely dispersed among a multiplicity of sources in the federal, regional and provincial administrations. Citizens also need to be better informed about their rights concerning access to information and to courts in environmental matters. Public consultation could be improved by allowing more time to take comments into account. *Environmental education* could be further improved, especially at higher education levels (e.g. university level), to increase *eco-consumption*. Energy efficiency and use of public transportation could be increased. Available information on the *impact of environmental policy on employment* in Belgium is not sufficient to support a better integration of environmental and employment policies.

♦ ♦ ♦

The *social context* of Belgium includes high population densities, different linguistic communities, high unemployment, income disparities and health progress (Box 5.1) (Chapter 6). Social concerns are very present in the *sustainable development* federal framework (institutions, planning, actions) and in regional and community policies such as sustainable development planning in Wallonia (Chapter 4).

1. Environment and Employment

A key challenge for Belgium is to reduce *unemployment* (Figure 5.1). The environmental sector is modestly but steadily contributing to this goal.

Environment-related jobs

The 1998 OECD Environmental Performance Review of Belgium indicated that the country had approximately 50 000 *environment-related jobs* and that the field of environmental protection offered many job creation opportunities. Recent data show the number of jobs in the environmental field has increased by 10%.

In *Wallonia*, a recent study that reviewed *environment-related jobs in the region* (ICEDD-ASBL, 2004) estimated their number at nearly 23 000 in 2005, or 1.6% of the working population (Table 5.2). The private sector accounts for almost 47% of the

Box 5.1 **Social context**

With 10.5 million people, Belgium has a *population density* of 343 inhabitants per km^2. The average annual population increase of 3.5 per thousand is made up of a low natural increase and a positive immigration balance. Flanders has a population of 6.1 million and a population density of 448 inhabitants per km^2; Wallonia has a population of 3.4 million (202 inhabitants per km^2); and the Brussels-Capital Region has about 1 million (Table 5.1). Brussels is the capital of Belgium, of Flanders and of the Brussels-Capital Region. Namur is the capital of Wallonia.

Belgium has 15 *urban areas* with more than 80 000 inhabitants, in which 53% of the population and 63% of the country's employment are found. The country also has a wide scattering of quasi-urban settlements on rural land. The five largest cities, Brussels, Antwerp, Ghent, Liège and Charleroi, form part of larger urban areas of at least 1 million inhabitants. The growth of urban areas has partly been caused by demand for housing due to the combined effects of population growth, decreasing family size and increasing wealth.

Belgium has *three official languages*, Dutch, French and German, and thus has three officially recognised linguistic communities, each with its own cultural identity. Belgium is situated along an axis extending from England to the north of Italy that has been densely populated and developed since the Middle Ages.

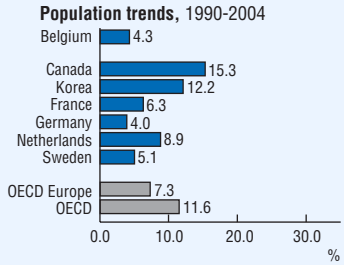
Per capita GDP, although unevenly distributed among the three regions, is well above the OECD average. The wealthiest 20% of the population earns four times more income than the poorest 20%. About 15% of the Belgian population is at risk of (relative) *poverty* (i.e. living in households with a disposable income below 60% of the median income), a rate close to the regional average. The *unemployment* rate rose in the early 2000s to reach 8.4% in 2005, above the OECD and European averages. The national unemployment rate hides great disparities between the regions with higher rates in the Brussels-Capital Region and Wallonia and lower rates in Flanders (Table 5.1). In Belgium, 62% of the adult population has completed at least upper secondary *education* and 6.4% of the GDP is devoted to educational expenditure.

jobs, the public sector for 45%, and non-profit organisations for 8%. The jobs are equally divided between *resource management and pollution management*, and waste and water management are the main job areas.

In the *Brussels-Capital Region* the number of environmental jobs is estimated to range between 4 500 and 8 400 (i.e. between 0.7% and 1.3% of total employment). A recent study of the *impact that a more sustainable construction orientation would have on employment* (i.e. by minimising the negative environmental impacts of

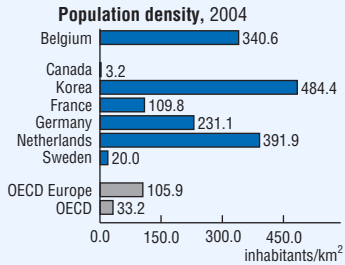
Figure 5.1 **Social indicators**

Population and ageing



Population change		1998	2004
natural increase	‰	0.95	1.3
net migration	‰	2.1	4.1
		1998	2004
Foreign population	%	8.7	8.3
Ageing		1998	2004
over 64/under 15	ratios	0.93	0.97

Settlement and mobility



Population by type of region	early 2000s		
	% population	% area	density
urban	79.9	57.2	467
intermediate	17.7	28.2	209
rural	2.4	14.5	55

Mobility		1998	2004
car ownership	veh./100 inh.	44	47
rail traffic	billion pass.-km	7.1	8.7

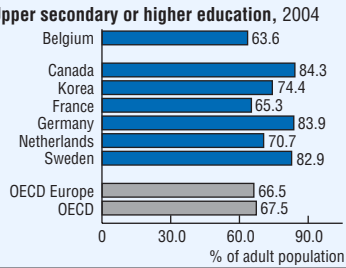
Income and employment

Regional disparities		1990	Late 1990s
income/inh.	variation coefficient	24.0	23.1

Labour force participation		1998	2004
total rate	%	65.0	66.2
female rate	%	57.7	58.2

Unemployment (standardised rates)		1998	2005
total rate	%	9.3	8.4
female rate	%	11.2	9.5

Health and education



Educational attainment		1998	2004
upper secondary	%	56.7	63.6

Life expectancy			1998	2004
at birth:	total	years	78.0	79.5
	female	years	81.1	82.4
at age 65:	male	years	15.6	16.8
	female	years	19.9	20.7

Source: OECD Environment Directorate.

Table 5.1 **Belgium and its regions,** mid-2000s

		Belgium	Flanders	Wallonia	Brussels-Capital
Land area	(sq. km)	30 528[a]	13 522	16 844	162
Population	(million)	10.5	6.1	3.4	1.0
Population density	(inh/sq. km)	343	448	202	6 249
GDP	(billion EUR)	298.2	170.9	69.8	57.5
GDP/capita	(Be = 100)	100	99	72	200[b]
Agricultural land	(%)	*46*	*46*	*46*	*2*
Unemployment rate	(%)	*8.4*	*5.4*	*12.0*	*15.7*
Forested area	(000 ha)	694	148	545	2
Motor vehicles[c]	(per 1 000 inh.)	465	478	437	485

a) 33 990 km^2 if Belgium's territorial waters in the southern North Sea are included.
b) Figure distorted by the fact that many Belgium-wide enterprises declare all their revenue in Brussels.
c) Passenger vehicles only.
Source: FPS Economy, SMEs, Self-employed and Energy; OECD.

construction, and improving the energy performance of buildings) estimated that at least 2 450 jobs could be created by 2010 (a 3.6% increase in the construction sector) (RDC-Environment, 2004).

In *Flanders*, there is no recent estimate of employment in eco-industries and environmental services. An estimate for 1997 gives a total number of jobs in the environmental sector (including government jobs) at about 25 500 (SERV, 2000).

Net effect of environmental policies on employment

One practical example of recent efforts in Belgium is the work done in "*re-use centers*", where used household appliances are collected, repaired if necessary and sold. This extends the life of such goods, makes them available at an affordable price, and generates employment for people who would otherwise have a hard time finding a job in the current economy.

Available evidence suggests that Belgium's environmental policies have had a *neutral macro net effect on employment* (job creation minus job elimination). This is consistent with findings in other countries. A study is currently underway to develop a model for Flanders to estimate the effects of environmental policy measures on employment. Additional studies of the interface between environmental policies and employment would be welcome.

Table 5.2 **Environmental employment,** Wallonia, 2005

(number)

	Activity	Business	NFPO	Public sector	Total
POLLUTION MANAGEMENT	Air pollution control	323	–	25	348
	Contaminated soil remediation and clean up	396	11	–	407
	Environmental consultancy and engineering	569	81	511	1 161
	Environmental research and development	–	128	–	128
	Waste management	4 581	183	1 929	6 693
	Waste water treatment	740	9	476	1 225
	Noise and vibration control	71	10	17	98
	Environmental monitoring, analysis and assessment	102	33	869	1 004
	Education, training, information	–	–	16	16
	Total	6 782	455	3 843	11 080
RESOURCE MANAGEMENT	Indoor air pollution control	–	–	1	1
	Water supply	12	16	3 133	3 161
	Recycled materials	1 027	502	–	1 529
	Heat/energy saving and management	486	–	59	545
	Renewable energy	803	–	17	820
	Environmental consultancy and engineering	317	31	148	496
	Environmental research and development	–	51	30	81
	Sustainable agriculture	991	28	522	1 541
	Sustainable forestry	462	–	944	1 406
	Education, training, information	–	659	1 550	2 209
	Total	4 098	1 287	6 404	11 789
POLLUTION AND RESOURCE MANAGEMENT TOTAL		10 880	1 742	10 247	22 869

Source: ICEDD, 2005.

2. Environmental Democracy

2.1 Availability of environmental information

Over the review period, *environmental data collection and publication* improved markedly in Belgium at both regional and federal levels, allowing better data comparability across the country and reporting at European and other international levels.

Like a number of other OECD countries, Belgium has developed State of the Environment (SOE) reporting mechanisms to meet domestic needs and international

reporting obligations. In Belgium this has had an important impact on the *quantity and quality of environmental data*. For the last 12 years, Flanders has published a series of seven SOE reports (called MIRA-T thematic reports) (VMM, 2005), and more recently it has published four State of Nature and Biodiversity reports (NARA) (Dumortier *et al.*, 2005) as well as a policy evaluation report (MIRA-PE) on a regular basis. In Wallonia, an SOE unit (the Cellule État de l'Environnement Wallon, or CEEW) is in charge of environmental reporting (Ministère de la Région Wallone, 2006). The cell is a university team that works closely with the regional authorities. Its mission was framed by a special committee established in 2002 by the General Director of Natural Resources and Environment, with representatives of all economic sectors of the region as well as from the Walloon Council for Environment and Sustainable Development. The Brussels-Capital Region produces its SOE report every four years (2004 being the latest one) and a summary report every two years.

Several permanent structures have been established since 1994 to co-ordinate information exchange *among regional and federal environmental administrations*. These include: the Interministerial Conference on the Environment (ICE); the Co-ordination Committee for International Environmental Policy (CCIEP); the Interregional Unit for Environment (IRCEL/CELINE), which is responsible for gathering and structuring air emissions data and is the national focal point for the European Environmental Agency and the European Environment Information and Observation Network (EIONET); and the Climate Commission, which deals with the National Climate Plan, UNFCCC and the Kyoto Protocol. Nevertheless, some regional data series cannot be aggregated into Belgian data series.

Public authorities also *co-operate with industry* to provide mutually comparable country-wide data on pollutant emissions. The Walloon Region works with three main counterparts: company representatives; representatives of citizens and associations of the province; and the general public. In the Brussels-Capital Region, companies have a legal obligation to provide certain data, including data on collection and elimination of hazardous wastes.[1] In addition, around 3 000 enterprises voluntarily provide data on energy consumption contributing to energy balance and CO_2 emissions. In Flanders, information exchange among public authorities, citizens and companies has been improved and simplified through the use of interlinked central databases. From 2005, annual reporting obligations from private companies have been integrated into the "Integral Reporting Tool", which includes the waste inventory and information on discharges of waste waters and groundwater extraction.

Since 2003, the Walloon Region has carried out an *annual integrated environmental survey* through an online reporting tool with 300 enterprises which collect information on water, air, wastes, energy and environmental expenditures.

2.2 Access to information, public participation and access to justice

In Belgium, the *Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters*, or "*Aarhus Convention*" (Box 5.2), entered into force on 21 April 2003. Belgium's federal and regional authorities have legal obligations under this convention as well as their responsibilities to implement the European directives related to environmental democracy. The various authorities all provide detailed information on their implementation of the *convention* in Belgium's official national implementation report to the UNECE, thereby complying with Decision I/8 of the Meeting of the

Box 5.2 The Aarhus Convention and its translation into European directives

The tenth principle of the Rio Declaration of 1992 is the basis for the United Nations Economic Commission for Europe (UNECE) Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters, commonly known as the *Aarhus Convention*, which was adopted by 39 countries on 25 June 1998 in the city of Aarhus, Denmark. The convention entered into force on 30 October 2001.

This convention links environmental rights with human rights, public authority responsibility and environmental protection. It establishes that citizens and their associations have *certain rights concerning the environment*, and that consequently governments that are party to the convention should contribute to the fulfillment of those rights (through national, regional and local authorities). The convention deals with three pillars or categories of rights: *access to information*, *public participation* and *access to justice*.

In 2003, the two first categories were "translated" into *two EU directives*, making the European legislation compatible with the convention. Directive 03/4/EC grants citizens the right to start administrative or judiciary procedures concerning acts or omissions which do not respect the right of public access to environmental information. It also foresees that environmental information should be disseminated and made available systematically to the public. Directive 03/35/EC relates to public participation regarding the elaboration of certain environmental plans, programmes and specific industrial activities. Both directives also include provisions concerning *access to justice*. These have been implemented by EU member states since 2005.

Belgium signed the Aarhus Convention on 25 June 1998 and ratified it on 21 January 2003. Belgium has transposed the two European directives in its *federal and regional legislation*.

Parties of the Aarhus Convention. To promote the public's environmental rights, a national website has been set up with information on the Aarhus Convention and its implementation in Belgium. In the Brussels-Capital Region, an information service has been set up.

Access to environmental information

Many good efforts are underway at federal and regional levels to *make environmental information accessible to citizens* and target groups. In Flanders, for example, households can get information on their drinking water quality from their local supply company; in Wallonia this information is included in the water bill or by contacting the local supplier. In the case of an emergency, information on non-potable water will be transmitted by the press (TV, radio, newspapers). Several e-mail addresses have been created to deal with information requests from the public.

To provide environmental information, Belgium has like many countries had to deal with multiple sources of information. Although the authorities are committed to providing full public access to information, there is room for improvement in making the *access more user-friendly*.

Public participation

Public consultation is important for improving environmental policies and is increasingly used world wide. In Belgium's three regions, public consultation is required for most *permits and planning procedures* and for licensing of projects subject to an environmental impact assessment (EIA). All important policy plans and programmes are submitted to public review. In Flanders, several new methods of public consultation have been explored including focal groups (environmental planning) and participative planning (land use, sustainable living).

At the *federal level*, consultation with NGOs is becoming regular practice, for example through the CCIEP, which reviews the links and overlaps between international agreements. In *Wallonia*, several advisory boards have been created to consult civil society prior to adopting environmental laws or regulations (e.g. on sustainable development, water policy). In *Flanders*, the environmental administration is increasing the involvement of industry, agriculture and consumers during the policy development, implementation and evaluation process to increase awareness and responsibility. The Flemish Institute for Science and Technology Assessment (ViWTA), which is attached to the Flemish Parliament, includes citizen participation in project development (as part of the regional government's effort to support new forms of participation). In the *Brussels-Capital Region*, representative organisations are part of the Brussels Environment Council, which issues opinions on

draft laws, plans and programmes to be adopted by the regional government. The environmental plans with legal obligations have to undergo public consultation, and the final plans must reflect the conclusions of the consultation.

Although Belgium has clearly recognised the usefulness of public consultation and has done much to enlarge it, there is room for improvement: *target group* consultation should be better structured, *public debate* should be enhanced, better follow-up information should be provided, and better *timing* for consultation should be considered.

Access to justice

The federal government has full responsibility for the judicial aspects associated with environmental issues (while the regions have responsibility only for non-judicial administrative procedures). Descriptions of ways in which the Aarhus Convention provisions are implemented at the regional and federal levels are to be found in the *Implementation Report of the Convention*.

At the federal level, no reporting has been done on judicial activities concerning environmental matters. However, a new Act (5 August 2006) on public access to environmental information foresees a four-year report by the federal ministry in charge of environment regarding law and policy enforcement. The new act would also establish a *federal appeals commission* for access to environmental information with the power to make binding decisions on access to environmental information. A Belgian NGO has submitted a *complaint* to the Compliance Committee of the Aarhus Convention concerning Belgium's non-compliance with the provisions regarding access to justice, on the grounds that "the narrow interpretation of the concept '*interest*' under Belgian law constitutes a barrier to wide access to justice for organisations" that aim to protect a public or common interest.[2] Certain court decisions made before the convention was enacted would have been in conflict with it. If those practices were to continue, Belgium would be in non-compliance. The Compliance Committee has recommended that Belgium: i) undertake practical and legislative measures to overcome the narrow jurisprudence of the Council of State with respect to giving environmental organisations access to justice, and ii) promote awareness of the convention (e.g. the provisions for access to justice).

3. Distributive Aspects of Environmental Policies

At the federal level, the social security system addresses poverty alleviation and the reduction of income disparities on the basis of the Public Centres for Social Welfare Act of 1976. In particular, it provides medical insurance and the living wage.[3]

In addition, in the Flemish Region the Social Impulse Fund Decree of 1996 supports local government actions for combating poverty and promoting welfare, focusing on urban renewal. The Belgian *Constitution* states that all citizens should be able to live their life with dignity. Social tariffs have been introduced in relation to water supply and sanitation, urban waste disposal and energy for households.

Social tariffs for water

The Belgian Arbitration Court has decided that every person has a right to a minimum supply of drinking water. Access to water is facilitated according to social considerations in all three regions. All three regions have laws establishing the *right of access to water*. The Belgian Parliament gave its support to change the Constitution in order to strengthen social features of water supply. Sanitation is mandatory in urban areas. VAT is at a reduced rate for water supply and does not apply to sanitation.

In *Flanders*, every person is entitled to receive *15 m^3 of drinking water free of charge per year*, an amount based on the World Health Organisation's recommendations (Van Huffel, 2004) and all but the poorest (receiving the minimum subsistence level, MSL) have to pay a sanitation tax. Water unit price above the 15 m^3 minimum is a constant. Flanders has introduced the obligation to store rain water in order to decrease water consumption. Its domestic water consumption has decreased. Its 2003 water supply decree specifies all public service duties in the area of water and sanitation.

In *Wallonia*, progressive water pricing is used for water supply and sanitation, with a first block of 30 m^3 per household per year. In addition, a "social fund for water" provides financial support to protect access to water for those who have difficulty paying their water bill. This fund is financed by a tax of EUR 0.0125 per m^3 of billed public water supply. In 2006, the maximum amount given per household was EUR 182 (plus EUR 52 per person beyond the third household member). In 2004, 6 532 households (0.5% of the total number of connections) received a total of EUR 866 528 (average of EUR 132). Only 18% of people entitled to financial aid requested it. In 2006, Walloon authorities adopted the principle of creating a new contribution of EUR 0.01 per m^3 to provide *assistance for water projects in selected developing countries*.

In the *Brussels-Capital Region* an innovative progressive water pricing was adopted in 2005. It is based on three blocks of water consumption per person, followed by a fourth open block (above 60 m^3 per person per year) at a much higher price. In addition, there is a sanitation tax per m^3 which is reimbursed to the poor. Brussels has created a social fund for water, financed by a tax of EUR 0.01 per m^3.

Water disconnection in case of non-payment is subject to proper information of welfare centres and prior approval by a court. Schools receive a free allocation of water (one litre per day per pupil).

Overall, Belgium's pricing policy reflects that *water is an economic commodity with a social dimension*. It distinguishes between essential uses at low price and luxury uses at high price. Belgium can be considered to be fully implementing the *right to water* in its internal legislation. People in need will not be disconnected and the price of water will be affordable to poor households.

Domestic waste collection

Concerning *waste collection and disposal*, 24% of the Walloon municipalities grant total or partial exemption from the user charge to disadvantaged people; the less favoured are provided waste bags for free and/or charged weight-based collection at reduced rates.

All 308 Flemish municipalities have a pay-as-you-throw system for mixed municipal waste. In 2003, 99 (out of 308) Flemish municipalities included social factors when charging for the collection and disposal of municipal waste, and 50 municipalities did so when levying the general environmental tax. The social correction (e.g. free waste bags, a quantity free of charge for mixed municipal waste, a tax reduction) on average amounted to 43.6% for the domestic waste tax and 42.3% for the general environmental tax.

Social tariffs for energy

In Belgium, *poor households* (over 190 000 people) do not pay the yearly fee for gas or electricity and receive a free allowance of electricity, gas or heating oil. Such public service obligations are financed by a tax on electricity networks. No electricity cut can be made during winter because of non-payment of bills.

In *Flanders*, a 1996 decree stipulates that each person is entitled to a minimum supply of electricity and gas for domestic use: for instance, each household receives 100 kWh for free per year.

In *Wallonia*, there is a social tariff for electricity with an obligation to provide a minimum supply and to install for free on request a meter with a prepayment system and power limiting device.

Environmental risks

Exposure to cadmium is an issue in the Flemish Region, where it can affect the population living near zinc plants, which used to be relatively poor (Chapter 6)

(Nawrot *et al.*, 2006).[4] While zinc has been produced for more than a century in Flanders, a recent study in the north-east region of Flanders revealed a significant association between risk of lung cancer and environmental exposure to cadmium. At baseline (1985-89), cadmium was measured in urine samples and in the soil of participants' gardens, and the incidence of cancer was followed until recently. The procedure for the remediation of the existing cadmium contamination was established in a covenant between the industry and the Public Waste Agency of Flanders (OVAM). The first addendum to the initial covenant, covering a 15-year period, was signed in April 2004. The regional and municipal authorities had been closely co-operating with industry before 2004, including to develop emission limits and to raise public awareness about the potential harmful effects of exposure to cadmium. In February 2006, the Ministers of Environment and Public Health launched a cadmium plan for action which includes a human biomonitoring campaign.

In Wallonia, the framework law on *mining* has provisions for environmental liability, which include obligations for mining companies to cover the remediation costs of any environmental damage resulting from the mining activity. For short-term environmental impacts, this translates into financial compensation to owners of the land affected. In the case of persistent or more acute soil contamination (which makes the land unfit for its original purpose), owners of the contaminated land can ask the mining company to buy their land.

4. Environmental Awareness

Much has been done to stimulate changes in *consumption patterns*, through provision of information on products and services as well as environmental education. Although the federal government is responsible for product policy, the regions provide information on the environment to influence *consumer* behaviour. Environmental *education* is under the responsibility of the three linguistic community governments.

4.1 Information and public behaviour

In Wallonia, Regional Centres for Initiation to the Environment (CRIE) provide *information, awareness and training* on environmental issues from a sustainable development perspective. The centres are located throughout the region so as to be easily accessible to interested *citizens* and to schools, teachers, nature guides and forestry agents. They privilege field work to put citizens in direct contact with nature and the environment. Wallonia also benefits from the work of the non-profit organisation "*Eco-Consommation*", an association supported by regional authorities

which helps consumers to adopt more sustainable, healthy and environmentally-conscious consumption and behaviour. The association offers free advice by telephone and e-mail, produces brochures and other publications, and writes a newsletter on the "art of eco-consumption" and an agenda of sustainable development events, to inspire the public to save energy and use renewable energies.

In the Brussels-Capital Region, voluntary actions were supported successfully by authorities to promote *waste prevention*. Many projects were launched in the framework of the region's three waste management plans (e.g. introducing ecological teaching material, dematerialisation in offices, individual and neighborhood composting, use of lunchboxes and flasks in schools rather than throw-away packaging). These achieved measurable results (reduction of weight of waste), qualitative objectives (behaviour changes), and educational objectives (number of persons informed).

In Flanders, regional authorities have signed voluntary agreements with the five *provinces* and 250 *municipalities* (Box 4.5) to stimulate environmental and sustainable development. Financial assistance from the region is provided based on commitments and actions. Actions initiated to date include communication campaigns, implementation of the polluter pays principle and support for innovative projects. While much progress has been achieved in water management and reduction of household waste, more could be done to reduce household energy use and increase the use of public transportation.

The *Federal Authority* has developed information campaigns. In 2005, together with the two NGOs "Natuurpunt" and "Natagora", it began a campaign on the North Sea, "Belgium's eleventh province", to increase public awareness.[5] The "clean car campaign" provided information on the environmental impact of driving style and the purchase of cleaner cars. Its campaigns with territorial authorities include information on ozone and on the environmentally-friendly use of paints and varnishes. Despite the information campaigns, however, the total amount of packaging placed on the Belgium market increased from 1 477 830 tonnes in 1999 to 1 490 200 tonnes in 2002.

Co-operation concerning *recreation and nature* is supported through the *Regional Landscape Associations* (RLAs), which group three or more municipalities to promote ties with stakeholder groups. Eleven RLAs have been formally recognised, and are thus eligible to receive financial support. Walloon initiatives promoting municipal plans for nature protection and waterway schemes involve public bodies as well as local stakeholders and contribute to a better understanding of nature and biodiversity issues.

Trade unions play a mayor role in raising awareness of safety, health and sustainable development issues in the workplace. They participate very actively in the environmental, economic and social policy-making of the country. The unions are involved in designing programmes and projects to reinforce workers' rights (e.g. industrial strategies, International Labour Organisation conventions, employment policies, collective mechanisms to achieve sustainable development, educational programmes). Each region has its own environmental network of trade unions: RISE in Wallonia, BRISE in Brussels, and Vlaams Intersyndicale Milieuprojecten in Flanders. Trade unions also participate in the Council of Scientific Policy (where discussions on technology assessment and transfer take place) and in the Federal Council for Sustainable Development. The trade unions work closely with the federal and regional governments in the development of sustainable development projects and the design of educational and training programmes. The management's lack of transparency regarding the engagement of company and trade union representatives elected to the works committee has been pointed out.

4.2 Environmental education and training

During the review period, *environmental education* (EE) developed very significantly in Belgium. The *Flemish community* took important steps to introduce and/or reinforce environmental awareness through EE. EE was introduced in 1997 at secondary level and in 1998 at primary level, as part of the compulsory subjects proposed by the Ministry of Education and approved by the Community Parliament. A number of cross-cutting environmental themes were also incorporated into the curriculum. A programme called Environmental Care at Schools ("*Milieuzorg op school*" or MOS) was undertaken in the Flemish Region and the five Flemish provinces, aimed at implementing environmental management schemes in nursery, primary, secondary and high schools. The programme was useful in reducing pressure on the environment and in promoting student participation and environmental awareness. Specific programmes exist to optimise relations between agriculture and nature management and to stimulate green consumption.

In the *French community*, while EE and Education for Sustainable Development (ESD) are not explicitly part of the general objectives of primary and secondary education and are not compulsory, they are being developed in keeping with the 1997 Decree on Education and public demand for more and better EE and ESD. Primary environmental education focuses not only on nature, but also on newer topics (e.g. waste and health). For secondary environmental education, which was seen as more problematic, the Ministry of Education decided to award a prize for the best EE and ESD projects in 2004-05. A 2003 co-operation agreement, signed between the Walloon Region and the French community regarding environmental education, aims

at favoring synergies between the Regional Centres for Initiation to the Environment and the Centers for Recreation ("Dépaysement de Plein Air").

In the *German community*, EE is not included formally in the education policy but depends on initiatives taken by individual teachers or schools in certain environmental campaigns. In primary school, much attention is given to eco-consumption and to health and environment issues.

Overall, Belgium made good *progress* during the review period in environmental and sustainable development education, particularly at the primary and secondary levels. *The engagement of Flemish, French and German community* authorities has been beneficial. Further thought should be given to environmental education at higher levels (e.g. university level).

4.3 Role of environmental NGOs

Environmental NGOs are active in Belgium and are involved in many projects, including some done with governments. Wallonia provides financial support for some of their activities. In 1999, for example, the Walloon Region concluded a framework convention with the federation of associations Inter-Environment Wallonia, with a broad mission of information, technical assistance and public awareness for its member associations and citizens. A federal representative participates in regional commissions in areas such as notification of industrial pollution, as well as in the network for eco-consumption, waste, water and rural issues. In the Brussels-Capital Region, the regional administrations responsible for green public spaces involve all actors in *participatory processes*. Some NGOs are subsidised to organise management work in semi-natural sites, green classes, and information and communication on eco-consumption. In Flanders, NGO participation is organised by several instruments[6] which set the rules for the recognition and subsidising of associations that deal with the environment, nature, forestry, hunting and wildlife management, and that establish the Environment and Nature Council of Flanders. The Flemish government, in addition to its financial support for co-operation between NGOs and municipalities, has made an agreement with nine regional environmental NGOs to assist and advise municipalities and provinces to stimulate co-operation with local NGOs.

The Federal Authority's financial support to the four environmental NGO federations (i.e. Wallonia, Flanders, and Brussels' French-speaking and Dutch-speaking federations) and other NGOs has been increasing. NGOs are able to participate in the definition of the Belgian position concerning new EU and international environmental legislation through the CCIEP bi-annual stakeholders meeting or *ad hoc* meetings.

Notes

1. Except for PCB – PCT, for which an elimination plan has been implemented.
2. See Aarhus Convention Compliance Committee DATASHEET, Ref. Num. ACCC/C/2005/01 submitted on 03/01/2005.
3. In 2002 the living wage superseded the minimum subsistence level (known as "minimex"). The federal authority is responsible for the rules governing adjuration and financing of the living wage. Its financing is shared by the federal and municipal authorities.
4. The release of cadmium occurs as part of the production process of zinc.
5. From April to September, volunteers from the two NGOs met tourists and inhabitants and handed out 100 000 folders, 3 000 posters and 2 000 maps of the North Sea natural reserves and area of activities.
6. Flemish Parliament Act of 29 April 1991.

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6 ENVIRONMENTAL-HEALTH INTERFACE*

Features

- Co-operation of federal, regional and community governments on environmental health
- Fine particles as a health threat
- Actions on indoor pollution

* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental Performance Review of 1998. It also reviews progress with respect to the objectives of the 2001 OECD Environmental Strategy.

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the environmental performance review of Belgium:

- further develop and firmly *implement the NEHAP and CEHAP*; specify appropriate *environmental health outcomes* and incorporate these in the plans of all governments;
- build on the current *co-operation among federal, regional and community entities to address environmental health issues*; in particular, strengthen research on and monitoring of the link between exposure to environmental conditions and human health, including multi-factorial effects;
- analyse the *costs and benefits* of environmental health policies;
- ensure that *data collection efforts* focus on policy-relevant information and establish mechanisms to transfer policy-relevant research to policy makers; consider extending the Flemish biomonitoring programme to cover the whole country;
- continue to strengthen the possibility for the *public to make balanced decisions* on health and environment, e.g. through education, product labelling and information campaigns;
- place greater emphasis on public *access to green urban areas* in land-use planning policies.

Conclusions

Belgium has vigorously taken up the challenge posed by the growing concerns about health and environment (e.g. growing numbers of respiratory diseases, asthma, allergies, cancers and obesity). The *federal government, regions and communities* closely collaborate on environmental health issues and have signed a co-operation agreement with the force of law. At all levels, the governments give importance to *science-based* assessments, providing *information* to the population, the *precautionary principle*, *planning and action*. During the review period they adopted the National Environment and Health Action Plan (NEHAP), which will soon include measures on children's environmental health (CEHAP), and established a permanent management structure to carry out joint research and monitoring. The federal government now includes environmental health in its responsibilities for *product standards*. Brussels-Capital is implementing a noise abatement plan and participates in an international project on air pollution and health. Flanders included environmental health outcomes in its most recent environmental policy plan and has since 2002 been implementing an

environmental health action plan; it has also initiated an extensive, ongoing human biomonitoring survey. Wallonia is developing a regional environmental health action plan with a series of indicators and plans to adopt a regional noise abatement plan, as well as a nutrition and health plan. All three regions have established services to provide diagnostic assistance in cases where the *indoor environment* is suspected of causing health problems. Good work is also being done in public awareness-raising and *education* about health and environmental issues, including the health benefits of access to nature.

Still, Belgium has yet to marshal all the elements needed to set *priorities* in this field efficiently. Environmental risk factors are implicated in the main causes of mortality (e.g. cardiovascular diseases, cancer, respiratory diseases). The *economic aspects of the environment-health interface*, essential to identifying the cost of diseases and the benefits of action, is still largely absent in the research and monitoring now taking place, although public health expenditure represents 9.6% of GDP and is growing. In particular, work is needed on *fine and very fine particles* in ambient air. The number of annual *ozone* episodes will need to be brought down substantially if Belgium is to stay within the 25-day maximum set for 2010 by the EU Ozone Directive. Progress is also needed in reducing *noise*, including that from road transport, railways and airports. Regarding water quality, *nitrates in groundwater* are a widespread problem as many aquifers show a nitrate content close to the limit of 50 mg per litre. High *pesticide* concentrations in some aquifers also pose problems for the drinking water supply. Pesticide use per unit of agricultural area remains the highest in OECD-Europe.

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Belgian authorities have done much since 2000 to better understand and reduce the *impact of environmental conditions on citizens' health*. Some of the chief concerns are long-standing pollution problems, such as fine particles in ambient air, ozone, indoor air pollution and noise pollution. Other emerging issues are still poorly understood, e.g. the increase in lifestyle-related allergies, multifactorial interactions in cancer pathology, the increasing number of active substances used as pesticides, and the increase in assisted pregnancies.

Belgium's actions in the area of environmental health are characterised by *close co-operation* among institutional partners. These include the *regional governments*, which are responsible for the environment,[1] *community governments*, which are responsible for health, and the *federal government*, which has a mandate in both areas, including for food safety.

The importance given to health and environment results from a number of factors including: special events, public concerns, scientific information, economic aspects and international co-operation. Belgium has been *very active internationally* (e.g. within the EU and the World Health Organisation) to promote increased attention to the relationship between health and environment and the *precautionary principle*.

1. Management Framework for Health and Environment

1.1 Legislation and institutional arrangements

Belgian policy-making in environmental health began in earnest in 1998 and fit into the wider *international initiatives* of both the World Health Organisation (WHO) Regional Office for Europe (i.e. the commitments made at the conferences of environment and health ministers held every five years since 1989) and the European Commission (Environment and Health Action Plan 2004-10). In July 2002, Belgium also signed up to the WHO and UN Economic Commission for Europe (UNECE) initiative on Transport, Health and Environment, and in June 2004 it ratified the 1999 Protocol on Water and Health to the UNECE Helsinki Convention on the Protection and Use of Transboundary Watercourses and International Lakes.

Several Belgian *laws* specifically address environmental health, and the Co-operation Agreement Regarding Collaboration in the Field of Environment and Health, signed in December 2003 by the federal, regional and community governments, has the force of law. In Flanders, a decree on preventive health adopted in 2003 enables the region to take initiatives to prevent environmentally-related illnesses from both indoor and outdoor sources, involving both physical and chemical factors. The decree covers: informing the public, taking measures to reduce emissions, and responding to complaints about pollution in buildings and in the atmosphere. In line with the precautionary principle, the decree allows action to be taken on the basis of probable rather than proven effects in order to balance the probability of occurrence with the potential seriousness of expected consequences (number of people exposed, societal impact of effects and actions). In Wallonia, a decree was adopted in 2003 to build the scientific capability needed to support policy actions in this field. Brussels-Capital adopted regional laws on noise abatement in 1997 and on air pollution in 1999. The federal government is reponsible for ionising radiation and for the 1998 Law on Product Norms aiming at the promotion of sustainable means of production and consumption and at environmental and health protection. The Flemish government took the initiative to adopt a decree covering the indoor environment. Two types of norm setting were introduced, with guide values and intervention values (unacceptable risk level).

Belgium also set up the *institutions* necessary to manage the required actions. At the highest (i.e. political) level, all environment and health ministers meet at least once a year in the Joint Inter-ministerial Conference on Environment and Health (JICEH) established in December 2003 as part of the above-mentioned co-operation agreement. At a lower (staff) level, the National Environment-Health Cell has one representative each from all the environmental and health administrations of each government. The cell has a permanent secretariat and a yearly programme of work (financed through a fixed cost-sharing arrangement among the partners in the co-operation agreement); it reports to JICEH on its progress. Flanders in 2001 set up the Flemish Centre for Environment and Health for scientific policy support. In December 2002, the Environment and Health Unit was established in the Environment Administration and the Health and Environment section in the Healthcare Administration was expanded. After three years of study by the public service scientific institute (ISSEP), the Walloon Government established, in 2006, an environmental health task force. Wallonia created an environmental health scientific unit (PEnSa) within the public service scientific institute (ISSeP) in 2003. Brussels-Capital established an environmental health department in 1999. All three regions have established services to carry out checks on the quality of the indoor environment.

1.2 Plans and objectives

Efforts to *curb the impact of environmental pollution on human health* were part of Belgium's environmental policy long before the first "environmental health" action plans were adopted. Air and water pollution programmes, chemical regulation and contaminated site remediation, to name a few examples, were at least partly based on a human health rationale.

The JICEH in April 2003 agreed on a *national environmental health action plan* (NEHAP) with seven overarching objectives (Table 6.1): these concern data collection and research as well as international and domestic co-operation, but they do not specify desired outcomes. The NEHAP should be seen as a shared framework for the efforts of all the administrations involved; it promotes synergies, even if it does not cover the entirety of their health and environment activities (Federal Public Service for Health, Food Chain Safety and Environment, 2003). The first seven NEHAP projects, with a total cost over the three-year period 2004-06 of EUR 300 000, are scheduled to:

– create a NEHAP website;

– conduct research on and develop strategies for fostering the role of product policy in combating indoor pollution;

– participate in the WHO/Environment and Health Information System (WHO/ENHIS) project, which involves a network of towns and cities linking data on pollution and health impact;
– formulate national environmental health indicators;
– establish an ozone-peak emergency plan (completed);
– conduct a mid-term evaluation of the implementation of the NEHAP and development of perspectives;
– participate in the WHO survey on mother's milk and POPs through collection of samples throughout the territory of the three regions.

In November 2004, JICEH agreed to formulate, under the aegis of the NEHAP, a *Belgian Children's Environment and Health Action Plan* (CEHAP) in accordance with the recommendation of the WHO Fourth Ministerial Conference on Environment and Health held the same year in Budapest. The CEHAP will include actions in four areas: i) indoor pollution in *crèches and schools*; ii) *mobility* and schools; iii) prevention policies for the *home, especially concerning indoor air pollution*; and iv) *monitoring* of health and environment.

The *federal government* is taking part in the seven NEHAP projects. It has also, since 1996, been implementing a series of actions included within the tri-annual acidification and ground-level ozone abatement programmes with the aim of reducing emissions of SO_2, NO_x and VOCs; the programmes target policies on transport, energy, product standards and research, as well as cross-cutting tax policies. In addition, the second Federal Plan on Sustainable Development (2004-08) proposes to create an inventory of existing databanks on health determinants. The federal government also adopted in 2005 its first programme to reduce the use and risks of biocides and agricultural pesticides.

Wallonia set itself four priorities (Table 6.1) and adopted in June 2005 a draft List of Actions on Environment and Health (LARES) specifying an extensive range of outputs, though not outcomes; the list is to be developed into a regional strategy by September 2006. *Flanders* is implementing its Environmental Health Action Programme (2002-06) with a series of qualitative objectives concerning the development of better monitoring (including human biomonitoring) data and expertise, research, and strengthening of the health-related aspects of existing environmental policies and practices. The programme draws its health-related quantitative objectives from the MINA environmental policy plan 2003-07 (Table 6.1) (MINA-Plan 3). In *Brussels-Capital*, health aspects are present in both the regional action plan on Air Quality and Climate Change and the action plan on Noise Abatement in Urban Areas; the region also participates in the international project APHEIS (Air Pollution Health Environment Information System).

Table 6.1 **Selected environmental health objectives**

Overarching aims of the National Environmental Health Action Plan (NEHAP), 2003

- Establish functional co-operation between the environmental and health structures
- Develop and manage databanks for every aspect of environment and health
- Set priorities for research on the relationship between environment and health
- Develop a policy of prevention in the area of environmental health
- Increase communication about the relationship between environment and health
- Support the development of education and training in environmental health
- Raise awareness and education among the public and professionals in both the health and environment fields about the relationship between environment and health

Targets of the Flemish government (MINA-Plan 2003-07)

Dispersion of environmentally hazardous substances

- Reduce pesticide use by 50% (2005 compared to 1990)
- Avoid exceeding the PM_{10} annual average concentration of 40 $\mu g/m^3$ by 2005 (Directive 99/30/EC)
- Reduce the PM_{10} annual average concentration to 20 $\mu g/m^3$ by 2010 (Directive 99/30/EC)
- Reduce dioxin deposition to a maximum of 26 pg/m^2/day (monthly average) by 2005

Noise

- Reduce noise to the point where no more than 15% of the Flemish population is potentially highly annoyed by 2007 and 10% by 2020
- Reduce the percentage of the Flemish population that is exposed to daytime traffic noise (outside, in front of facade) with a LAeq-level above 65 dB(A) to 15% (2020)
- Reach agreements on quiet areas with a total surface area of at least 300 km^2 (2007)

Goals of the Walloon government

- Develop and harmonise the collection and treatment of health data (e.g. on respiratory illnesses, allergies, cancers, birth defects) in Wallonia
- Develop, as soon as possible, an inventory and assessment of existing indicators in order to define a list of relevant environmental health indicators
- Establish a single centre with responsibility for the dissemination of information to the public and dialogue in environmental health matters, as well as for emergency management
- Adopt and implement the noise plan ("plan bruit") and air plan ("plan air")

Plans of the Brussels-Capital Region

- Brussels urban area noise abatement plan 2000-05
- Action plan on air quality and climate change

Plans of the federal government

- Second Federal Plan for Sustainable Development (2004-08), notably Action 11, "providing better information and making health care more accessible" and Action 12, "Quality of food"
- Federal Scheme to Abate Acidification and Ground-level Ozone (2004-07)
- Federal Ozone and Heat Wave Plan
- Federal programme to reduce the risk of biocides by 50% and of agricultural pesticides by 25% over 2001-10

Source: Various plans of Belgian government entities.

2. The Scope of the Problem

Belgium's 2001 and 2004 National Health Interview Surveys (triennial surveys carried out by the Belgian Scientific Institute of Public Health) found that *one in five citizens professes to be disturbed by environmental factors such as noise from road, rail and air traffic, industry and neighbourhood, vibrations, and bad odours from industry*. The 2004 survey found that people living in urban areas were much more disturbed than those in rural areas.

2.1 Environment and health

Environmental risk factors are implicated in many of the major causes of mortality in Belgium. The *three main causes of mortality* (cardiovascular diseases, cancer and respiratory diseases), which together are responsible for almost three-quarters of deaths in Belgium, are all *associated with environmental factors* (Table 6.2). Still, relatively few studies examining the impact of environmental factors on the health of the Belgian population have been completed thus far (Table 6.3), and it is often difficult to specify causes and quantify the effects of environmental pollution on population health. A study by the scientific institute of public health estimated that the high temperatures during the 2003 summer heat-wave caused or contributed to between 1 258 and 1 297 excess deaths of persons over 65 (Sartor, 2004).

A study[2] done for the 2004 Flemish Environment and Nature Report (MIRA) calculates the DALY (Disability Adjusted Life Years) and suggests that *no less than 3% of all illness in Flanders is attributable to environmental factors, especially PM_{10} and $PM_{2.5}$ pollution (causing 71% of illnesses related to environmental factors) and noise (18%)*. The study indicated that the total loss of years of healthy life (expressed in units of DALY) attributable to the environmental factors considered amounted to 35 908 in 2003, compared to approximately 95 000 for traffic accidents and 1.2 million for all illnesses (Table 6.4). From an individual's perspective, this would mean that on average approximately 160 days are lost over a 70-year lifespan due to these factors.[3] The role of environmental factors in cancer is also dominated by the impact of $PM_{2.5}$ on lung cancer (1 790 DALYs).

To obtain better information for public policy decisions, Flanders in 2002 initiated a five-year *systematic human biomonitoring programme* covering around one-fifth of both its territory and population. The programme collects a variety of biomarkers of exposure and effect in eight areas and for three age groups (Table 6.5). The selected areas are characterised by different environmental loads and include two urban areas (Antwerp and Ghent), a fruit growing area, a rural area and four industrial areas (the harbours, non-ferrous smelter, a chemical industry and household waste

Table 6.2 **Relative importance of causes of death,** Belgium, 1990s

Primary cause of death	Environmental factors implicated	Share of deaths (%)
Cardio-vascular diseases	Exposure to CO, PM, ozone, noise, hard drinking water	*37.2*
Cancers	Carcinogenic substances in ambient air (e.g. PAH, arsenic, nickel, asbestos, chromium VI), drinking water (e.g. pesticides, benzene, arsenic, vinyl chloride, by-products of chlorination) or food (e.g. pesticides containing arsenic, POPs [incl. PCBs, dioxins], mycotoxins). Exposure to radiation (radon, UV, electro-magnetic)	*27.0*
Respiratory diseases	PM_{10}, $PM_{2.5}$, SO_2, NO_2, ozone, VOCs, CO, lead, formaldehyde, etc.	*9.7*
Diseases of the digestive system	. .	*4.1*
Ill-defined symptoms and disorders	Allergens (e.g. pollen, moulds, mites)	*3.5*
Accidents, poisonings and injuries	. .	*3.2*
Neurological disorders	Methyl mercury in food (e.g. fish), PCBs in breast milk, VOCs, CO, formaldehyde, pesticides	*2.9*
Endocrine and metabolic disorders	Synthetic hormones, certain industrial cleansers, phtalates, dioxins, PCBs	*2.2*
Mental effects	Lead in air, water and soil (e.g. from industrial smelters, lead water pipes, old paint)	*2.0*
Diseases of the uro-genital organs	. .	*1.5*
Infectious and parasitic diseases	Bacterial, viral and parasitic contamination of food or bathing and drinking water (e.g. salmonella, campylobacter, E-coli, listeria, Legionella, Giardia, Cryptosporidium). Climate change-induced spreading of disease-carrying vectors (e.g. tics carrying Lyme disease)	*1.5*

Source: NEHAP.

incinerators). When monitoring reveals certain anomalies which are found to be relevant for health, sources are traced. The first results show that concentrations of various contaminants vary greatly both among and within the different sampling areas (Table 6.6). Flanders is also considering how the programme can be used to determine to what extent social differences affect environmental health risks. In order to guarantee that the results of the human biomonitoring campaign are translated into a policy response, a phased plan for action was developed.

2.2 Economic aspects

Given that *overall health expenditure* represented about 9.6% of Belgian GDP in 2003 *versus* 8.1% in 1993 (OECD, 2003), solid information on the public health

Table 6.3 **Estimated health effects of selected environmental factors,** Belgium

Env. fafctor	Effects	Impact on public health	Comment
Noise	Irritation Interference with communication Disturbance of sleep Diminution of performance Effect on pharmaceutical consumption (tranquillisers, sedatives)	The 2001 Belgian Health Interview Survey suggests that among the households complaining about noise, the following shares of them are: – irritated by noise 75% – affected in their sleep 58.5% – impeded in communication 16.4% – reduced in performance 11.6% These results are based on a multiple-choice questionnaire. A 2004 survey reveals that in Flanders 11.8% of the population claims to be highly or extremely annoyed by noise. The survey found that the following share of Flemish are: – woken every night by noise 2.4% – regularly sleep disturbed 15.7% The 2004 Belgian Health Interview Survey found that in Wallonia, the following share of households were annoyed by: – road traffic 10.2% – neighbourhood noise 5.6% – air traffic noise 2.7%	The share of Belgian households that in 2001 said their home was: – noisy 11% – not very noisy 29% – not noisy at all 60% The share of the population considering their homes to be noisy clearly depends on location: – Brussels 20% – other urban areas 15% – semi-urban areas 10% – rural areas 6% In the 2004 Belgian Health Interview Survey, the percentage of households disturbed at home during the 12 previous months by: – road traffic 9.1% – neighbourhood 5.7% – air traffic 2,4% – rail traffic 1.3% – nearby factories 2.0% – vibration 6.0%
Ambient air pollution (ozone, PM_{10}, heavy metals)	Respiratory and cardio-vascular disease Asthma Lung cancer	The Flemish biomonitoring survey found that 62% of external health costs due to air pollution and noise could be attributed to PM_{10}, whereas 18% were due to death through cancer.	
Indoor air pollution	Effect on well-being Allergy Other	In the 2004 Belgian Health Interview Survey, 22.1% of households reported being affected during the last 12 months by at least one environmental factor such as noise, odours, humidity, mould, electromagnetic fields or lighting pollution. More specifically, the following percentages of households said they were affected by: – odours from industry 2.2% – odours from other sources (sewers, waste, manure) 4.0% – humidity 2.8%	

Table 6.3 **Estimated health effects of selected environmental factors,** Belgium *(cont.)*

Env. fafctor	Effects	Impact on public health	Comment
Benzene and other PAHs	Leukaemia	The Flemish biomonitoring survey found that 2.7% of external health costs due to air pollution and noise can be attributed to morbidity and mortality caused by benzene and other PAHs.	
Radon	Lung cancer		More than 5% of dwellings in the Ardennes region (e.g. Verviers, Bastogne, Neufchateau) exceed the threshold value of 400 Bq/m^3 proposed by the Health Council. In other areas (e.g. Mons, Namur, Liège, Dinant) between 1 and 5% of buildings exceed 400 Bq/m^3
Food-borne bacteria	Acute gastrointestinal illness	About 100 outbreaks per year, affecting 1 000 persons	Stable
Cadmium	Kidney damage. Classified as a human carcinogen. Some authors also suggest effects on reproductive and immune systems	A 1999 national survey showed that the mean Cd content in the blood of Red Cross donors (740 participants in five cities) was 0.7 μg/l (cf. threshold value of 5 μgCd/l blood)	Kidney damage likely to be encountered mainly in occupationally exposed workers. The threshold reference value for cadmium in urine is < 2.5 μg/g creatinine
Dioxins and PCBs (dioxin-like)	Impaired immune system and/or reproductive health	A 2002 study in Wallonia found similar levels of dioxins and PCBs in the blood of people living near a landfill and incinerators in, respectively, a rural, semi-rural, and a semi-urban/semi-industrial area, as in that of a control group. Somewhat higher levels were found in people who had consumed meat from cattle raised near an incinerator that for years had exceeded current emission limits by a hundredfold. However even these levels were similar to those found in other European populations that are not exposed to a specific source of dioxins/PCBs. Also, plasma dioxin levels among Belgian blood donors are similar to those found in other European populations	In spite of the 1999 Belgian food contamination with PCBs and dioxins, human plasma dioxin levels are decreasing. This is mainly due to the decrease of octachlorodioxin (OCDD) After the food contamination measures were taken to guarantee a continuous secure human food chain (the establishment of the Contaminant Surveillance Monitoring system (CONSUM) and the Federal Agency for Safety of the Food Chain)

Source: Selected Belgian studies.

Table 6.4 **Number of years of healthy life lost as a result of various pollutants,** Flanders, 2003

	DALY[a]	(%)
Total	35 908	*100*
Total PM_{10} and $PM_{2.5}$	25 518	*71*
Total ozone	879	*2*
Total noise	6 528	*18*
Total carcinogens (with the exception of PM_{10})	2 009	*6*
Total Pb	974	*3*
DALY/inhabitant/year	0.006	
DALY/inhabitant/70 years	0.44	

a) DALY = Disability Adjusted Life Years or years of health life lost.
Source: MIRA-T 2004, Report on the Environment and Nature in Flanders.

costs of environmental pollution should be a key ingredient of environmental health policy making. To date, the economic aspect has received insufficient attention, although the following evaluations have been carried out:

– a 2003 Flemish study of the *impact of air pollution and noise* (Vlaamse Milieumaatschappij, 2005a), which found a total annual acute and chronic health damage of EUR 2.3 billion (1.5% of Flemish GDP); 62% was attributable to PM_{10}, 16% to ozone and 12% to noise. The same study found that 18% of external health costs are due to mortality caused by cancer;
– a 2001 evaluation of the external cost of *traffic-related air pollution* in Brussels-Capital (CEESE, 2001) based on 1998 data, which estimated annual damage at EUR 811 million. Of this, EUR 653 million was attributed to mortality caused mainly by $PM_{2.5}$, and EUR 159 million was attributed to morbidity, of which chronic bronchitis represented 62%, work days with reduced productivity 24%, and particle-related cancers 7%;
– a study being carried out by Flanders to calculate the social costs of a selected group of illnesses (e.g. breast cancer, endometriosis) which have been identified as possibly linked to environmental endocrine-disrupting chemicals.

2.3 Access to nature

Easy *daily access* (i.e. within 800 metres of home) to green areas such as parks or attractive landscapes is *part of a healthy life* and adds much to the quality of urban

Table 6.5 **Biomonitoring programme,** Flanders, 2002-06

Areas monitored			
1. Agglomeration of Antwerp	Environmental monitoring area (VMM)		
2. Agglomeration of Ghent	Environmental monitoring area (VMM)		
3. Ports: Antwerp and Ghent	Environmental monitoring area (VMM)		
4. Rural area	Population density < 250 inhabitants/km^2 (= P25) + exclusions: fruit orchards area and adjacent areas, > 5% industry, areas with registered emission sources + ambient values and motorway		
5. Areas with fruit orchards	Area of apple + pear trees > 10 ha/km^2		
6. Vicinity of municipal waste incinerators	Calculated concentration of smoke > = 1.2 μg/m^3		
7. Non-ferrous metals smelter (region of Olen)	Calculated concentration of lead > = 0.9 ng/m^3 (minimum Olen area)		
8. Chemical industry zone (Albert Canal industrial zone)	Calculated concentration of fictive pollutant > = minimum in village of Eindhout		
Age groups monitored			
	Newborns ±1 200 individuals	Adolescents (14-15 y) ±1 600 individuals	Adults (50-65 y) ±1 600 individuals
Markers of exposure	Cord blood: cadmium, lead Cord blood serum: marker PCBs, pesticides, dioxin-activity	Blood: cadmium, lead Serum: marker PCBs, pesticides Urine: 1-OH pyrene, tt-muconic acid	Serum: marker PCBs, pesticides, dioxin-activity Urine: 1-OH pyrene, tt-muconicacid, cadmium
Markers of effect	Biometry, TSH (heel prick), Apgar score, time to pregnancy Questionnaire: asthma and allergy Follow- up of part of children	Blood: comet test Serum: hormone balance Biometry, sexual development, hearing test, Questionnaire: asthma and allergy	Blood: comet test, HPRT Serum: tumour markers Urine: 8-OH dG Questionnaire: asthma and allergy
Confounders	Questionnaire: general + food Biochemical analyses: cholesterol, iron status cord blood	Questionnaire: general + food Biochemical analyses: cholesterol, iron status blood, urinary creatinine	Questionnaire: general + food Biochemical analyses: cholesterol, iron status blood, urinary creatinine

Source: Centre for Environment and Health.

living, but a large share of Belgian city dwellers do not have such access. This is particularly true for those living in densely developed areas where roads and railroads fragment the landscape and obstruct (crosswise) movement. The lack of access to green areas may be a factor in the growing problem of obesity, which affected 11.7% of the Belgian population in 2001. Compounding the dearth of green areas within cities is the fact that, with some exceptions, *Flemish cities* do not have forests on their periphery either. Furthermore, inhabitants of the poorer parts of cities often have less

Table 6.6 **Selected results of the Flemish human biomonitoring campaign,** 2002-03

Mean concentration of measured pollutants in umbilical cord blood[a]

	Agglomeration of Antwerp	Agglomeration of Ghent	Ghent/ Antwerp ports area	Albert Canal industrial zone	Region of Olen	Region with fruit cultivation	Rural site	Town of Menen area
Dioxin-like substances[b] (pg CALUX-TEQ/g lipid)	**25**	17	21	20	22	19	**30**	**25**
PCBs (ng/g lipid)	**81**	43	61	56	56	38	**84**	**111**
DDE (ng/g lipid)	112	71	105	**140**	125	76	**175**	**181**
HCB (ng/g lipid)	**24**	10	16	16	18	13	**29**	**33**
Cadmium (µg/l)	0.18	0.19	0.25	0.28	0.29	0.17	0.24	0.26
Lead (µg/l)	15	15	14	15	15	13	13	22

a) The shading compares area values with the overall weighted means: significantly higher, : significantly lower, and white not significantly different from mean.
b) CALUX-TEQ=Metric to evaluate the toxicity of dioxin-like compounds; CALUX = (Chemical-Activated LUciferase gene eXpression).
Source: VMM.

access to green areas than people in prosperous suburbs. Although the overall surface area of green space in Flemish land-use plans (i.e. on paper) grew between 1994 and 2002, ecological maps show that more than half of the region's valuable nature area is threatened by urban or agricultural expansion.

Wallonia is well-endowed with forests and landscapes suited to *weekend and holiday recreation*, but heavy use has necessitated regulation to reduce the noise of motorised traffic. Since 1995, the Walloon government has signposted 15 000 km of tracks and trails exclusively for walking, cycling, horse-back riding and cross-country skiing; shelters, benches, picnic tables and barbeque pits have been built along these tracks.

3. Reducing Health Threats from Air and Water Pollution

3.1 Outdoor air pollution

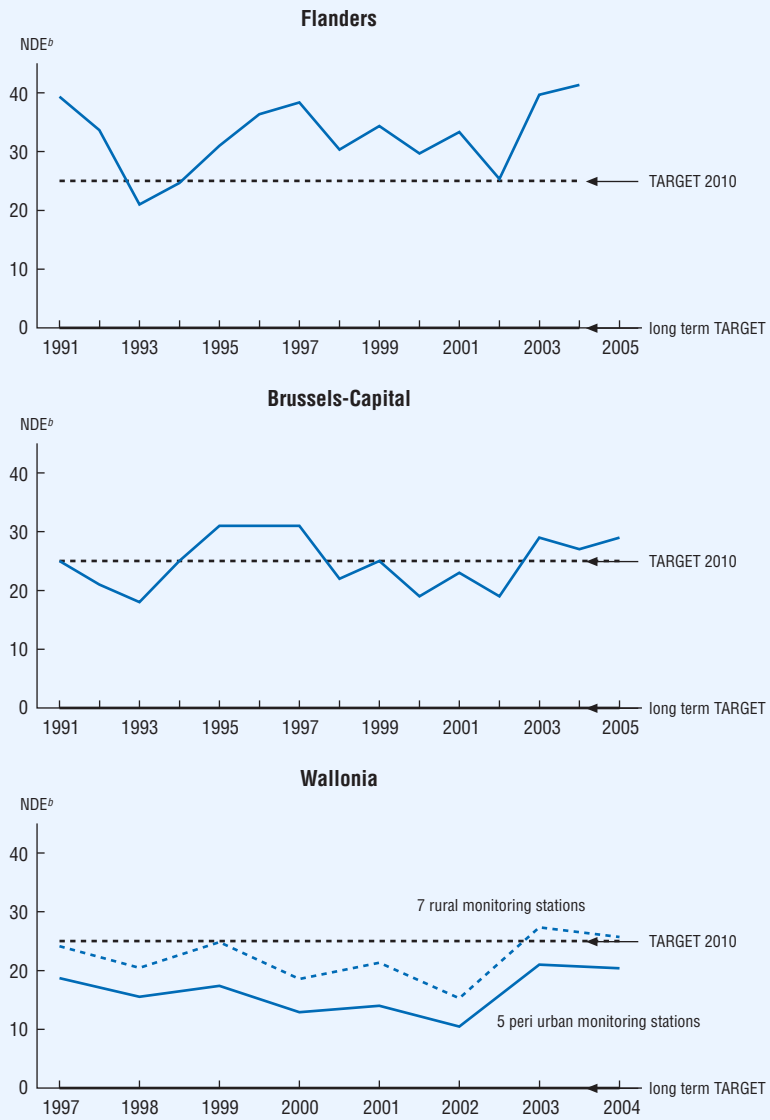
Exposure to *air pollution is the main environmental health risk* in densely urbanised areas in Belgium. The Flemish study on *air pollution and noise* suggests that 71% of environmental health problems (expressed in DALYs) can be attributed to fine particles and ozone; fine and very fine particles alone are responsible for the loss

of on average one-third of a healthy life year of each Fleming (Table 6.4). Air pollution is implicated in cardiovascular diseases, lung cancer and, in particular, asthma, for which environmental variables (even if not all related to air quality) constitute the primary risk factor. While there is little evidence that air pollution actually causes the disease, there is no doubt that it aggravates the condition of asthma sufferers. As in other European countries, *asthma-related mortality and morbidity have been on the rise in Belgium* for the past two decades or so. The disease is responsible for about 300 deaths annually or 0.28% of total deaths in Belgium. Concerning morbidity, clinical data indicate that for the sensitive groups aged 0-9 and 60-69, 30% and 12% of total hospitalisations, respectively, are due primarily to asthma and most are urgencies (Puddu *et al.*, 2003). In addition to the cost to the medical system (almost EUR 2 500 per patient in 1996), asthma also has significant social and economic impact in terms of absences from school and the workplace, loss of productivity, etc.

Further efforts will be required in the coming years to control ambient concentrations of *fine and very fine particulates* in various "hot spots" throughout Belgium. For PM_{10}, the health-related requirements of the EU Air Quality Framework Directive's first daughter directive, 1999/30/EC (i.e. fewer than 35 breaches of the daily limit value of 50 $\mu g/m^3$ for PM_{10}), scheduled to be achieved by 2005, were not met at 24 of 29 Flemish monitoring sites in 2004 (Vlaamse Milieumaatschappij, 2005b). Of the six sites monitored in Wallonia that year, the annual standard of 40 $\mu g/m^3$ was not met at two sites located in urban/industrial zones in Liège and nearby Engis. In Brussels-Capital, the daily PM_{10} limits were exceeded 65 to 76 times per year in the early 2000s. European legislation to control the damaging very fine particles $PM_{2.5}$ (for which transport is the main source) is still in preparation. In 2001, the PM_{10} annual mean was 24.9 $\mu g/m^3$.[4] This is above the 99/30/EC Directive limit value for 2010 (20 $\mu g/m^3$) and below that established for 2005 (40 $\mu g/m^3$). Regarding infant mortality, it is quite low in Europe and consequently the expected attributable number of deaths related to air pollution is also low.

Studies carried out on the consequences of the 2003 heat wave confirmed a clear correlation between daily variations in *ozone levels in ambient air and the daily death rate*. For much of Belgium, the number of days that the health-related standard for ozone (8-hr concentration of 120 $\mu g/m^3$) is exceeded remains well above the 2010 target of EU Directive 02/03/EC, which permits a maximum of 25 days (Figure 6.1). Furthermore, concern is also growing about the increasing background levels of ozone. In addition to measures taken by the regions and the federal government to reduce emissions of ozone precursor substances (Chapter 2), the latter has carried out a public information campaign (distributing 800 000 flyers and 3 000 brochures) every summer starting in 2000 to warn the population about the health effects of ozone peaks. The

Figure 6.1 **Ozone concentrations**[a]



a) 3-yr moving average of number of days that 8hr limit of 120 μg/m^3 is exceeded.
b) NDE = number of days of exceedance.
Source: IRCEL; IBGE-LRE; MRW-DGRNE-DPA-Cellule Air; ISSeP (Réseau télémétrique).

information campaign has now been integrated with the federal plan on ozone and heat waves, which provides guidance to public authorities for different phases of action in a developing crisis. Meeting ozone objectives will largely depend on the success of international emission reduction efforts (i.e. the Convention on Long-Range Transboundary Air Pollution, the EU National Emission Ceiling Directive), as the geographic scale of the physical-chemical processes causing the ozone problem extends well beyond Belgium (the country is part of the so-called Mid-western European hot spot region that spans the distance between northern Italy and Denmark).

3.2 Indoor air pollution

Belgians spend on average up to 80% of their time indoors, but the *effects of indoor air pollution* have long remained unexplored and hence largely undetected. This applies to individual apartments and homes (including for the poorest part of the population), where indoor air quality depends on the air outside as well as on emissions from indoor activities such as smoking, cooking, heating and house renovation. It also applies to certain public facilities (e.g. swimming pools, crèches, schools). Only limited quantitative information about the health effects of indoor air pollution is available; for instance, in Flanders approximately 700 people are hospitalised (of which 20 succumb) annually as a result of CO-poisoning. Current Flemish research focuses on NMVOCs in the indoor environment, and an investigation is being carried out among vulnerable subgroups of children to find out to what extent their exposure to hazardous substances occurs indoors A Walloon study in 41 crèches found that ventilation needed to be improved due to the presence of (natural) radon and asbestos in some localities.

Raising awareness of the issue among public officials, medical practitioners and others also leads to a better understanding of the problems involved. Wallonia mounted a campaign (Sandrine) in 1998 to raise awareness among medical general practitioners, architects and the public at large, and other, more focussed campaigns have taken place since, including some carried out locally (see below). Brussels-Capital has developed a practical tool (Squatte) allowing medical doctors to better trace the link between their patients' symptoms and potential causes originating from the indoor environment.

Since 1999, the Walloon province of Liège has been operating a *detection and advice service* that allows physicians to warn the authorities when they suspect a patient is affected by indoor pollution. The other Walloon provinces (except Brabant wallon) started their "green ambulances" or Laboratory on Indoor Pollution from 2002 onwards. Brussels-Capital followed suit in 2000 by setting up the Regional Intervention Unit on Indoor Pollution (CRIPI), also called the *green ambulance* (Box 6.1). A similar mobile

Box 6.1 **Brussels green ambulance**

Brussels medical practitioners can call a "green ambulance" when they suspect that a patient's complaint is due to conditions in the home or place of work. Green ambulance is the nickname for the *Brussels-Capital Indoor Pollution Intervention Unit* (CRIPI), established in early 2000 by the regional environmental administration (IBGE-BIM) in partnership with the Scientific Institute for Public Health and the Fund for Respiratory Ailments.

Although the outdoor environment can be a *source of indoor pollution*, the cause is usually in the house or building itself: construction materials, floor and wall coverings, paint, machinery including heaters, and domestic pets are among the possible sources. Measurements show that concentrations of some air pollutants (ozone, lead, SO_2) are usually lower indoors than outdoors. On the other hand, concentrations of CO, NO_x, hydrocarbons and aldehydes are often higher indoors.

The green ambulance is a non-medical *diagnostic service* able to detect potential causes of ill-health in the indoor environment. The ambulance brings a team of analysts and a social assistant to the home or building to take samples and have inhabitants fill out a questionnaire on their lifestyle. Results are then discussed with the medical practitioner (general practitioner or specialist) who alerted the service. Once a diagnosis is made, the CRIPI staff provides *advice on remedial measures*, which may be subsidised by regional authorities. Follow-up is also provided to ascertain the results of the intervention. The experience of and information collected by the service are also put to use in the evaluation of indoor pollution in the Brussels-Capital Region in order to formulate, in the longer term, a strategy (e.g. guidance, remedial measures) to prevent health problems from indoor pollution.

During its first three years, the green ambulance was called 317 times. An analysis of the service produced the following observations:

- interventions were made across all socio-economic groups and over the whole territory of the Brussels-Capital Region;
- one-third of the interventions were related to children;
- symptoms of concern were diverse, including respiratory ailments, skin allergies and nausea. Patients often displayed more than one symptom;
- homes were found to be contaminated by invisible chemical substances and by biological sources such as moulds and acarids (mites, ticks);
- in certain cases dwellings had to be condemned and inhabitants moved out;
- more than 50% of inhabitants experienced improvements to their health as a result of the intervention of the green ambulance.

Causes of the problems encountered included:

- the activities and behaviour of the inhabitants;
- inadequate ventilation;
- the building itself or its design.

service in Flanders started in 2004, aimed at users of public buildings (schools, libraries), residents and owners of houses, health workers and local councils. Medical environmental experts in the local health councils (Logos) and the Flemish health inspectorate can help find solutions to diagnosed problems.

Flanders has established ambient *air quality standards for indoor environments* (Decree on the Indoor Environment of June 2004, part of the environmental health legislation). The standards contain both *guide and intervention values*. Guide values correspond to a desirable quality standard for the indoor environment. Intervention values correspond to a maximum permissible risk level above which public authorities are obliged to take action, such as making building improvements or moving the inhabitants. In Belgium, the Royal Decree of 13 December 2005 bans smoking "in all enclosed public places and all workplaces, with the exception of the hospitality sector where partial restrictions apply". Smoking will be forbidden in restaurants, but owners of pubs and cafés where alcoholic beverages are served will have the possibility to establish a smoking zone under certain conditions.

3.3 Water quality

Belgium is implementing the EU *Drinking Water* Directive 98/83/EC, which extends the list of chemical (e.g. benzene, pesticide decomposition compounds) and microbiological quality standards to be monitored and tightens standards for certain substances, notably *lead* (which, in practice, requires all extant lead pipes in the network and individual houses to be replaced). In Wallonia, 99.1% of the volume of drinking water supplied met microbiological standards during 2002-03, 98.8% met the standard for nitrates and 99.4% met the standards for pesticides. In Brussels-Capital, drinking water quality met all standards. In Flanders, some purification plants are obliged to remove *pesticides* (atrazine, simazine, diuron) or *nitrates* in order to meet the standards; and some exemptions from the standards (e.g. for sodium, potassium) are still necessary due to high naturally-occurring levels in soils.

As in other countries, *gastro-intestinal diseases caused by swimming in open waters* are often under-diagnosed and under-reported, so it is not clear whether there is cause for concern, but a 2004 Flemish estimate puts the number of cases at 9.7 per 1 000 bathers. Regarding the quality of recreational waters, there were no bathing prohibitions at coastal sites in 2004, but just over 8% of freshwater sites had to be closed. The obstacle to improving the bacteriological water quality of recreational waters (especially in coastal areas) is the frequency of sewage overflows during periods of heavy rainfall (Chapter 2).

4. Reducing Health Hazards from Chemicals

Because hazardous chemicals are so widely present throughout society, their use is difficult to control. *Enforcing product bans and special conditions of use is therefore a critical government function* for the protection of human health. Belgium's federal inspection service employs five inspectors for pesticides and biocides and five for hazardous substances who carry out inspections according to a specified plan as well as in response to detected problems (e.g. the use of banned creosote in wood preservation).

4.1 Pesticides

In the Flemish human biomonitoring study, the cord blood concentrations of the two pesticides hexachlorobenzene (HCB) and DDE (a contaminant or breakdown product of DDT) in newborn babies living in three of the eight test sites were found to be higher than the corresponding weighted mean values of all test sites (Table 6.6). However, when the study results were compared with other foreign biomonitoring studies, the levels seen in the Flemish Region were found to be on the same order or even lower than in surrounding countries. Pesticide use per unit of agricultural area is *the highest in OECD-Europe* (Figure 2.6), and Belgium lags behind most other EU countries in reducing usage (OECD, 2006). Pesticide residues are widely dispersed in Belgian surface water bodies and groundwater, and recent reductions in pesticide use are not yet reflected in the results of water quality monitoring (Chapter 2). In Flanders, levels of atrazine and diuron (MIRA-T 2005) have dropped, but higher levels of replacement pesticides have been found (e.g. glyphosate). The pesticide problem is by no means limited to agricultural uses but also stems from use in gardens and public parks and alongside roads and railways. As previously noted, some water supply utilities in Flanders are obliged to remove pesticides in the purification process. In Wallonia, some suppliers have had to abandon certain sources due to their high concentrations of atrazine and its metabolite desethylatrazine.

Efforts to improve the country's performance in this area and to control the effects of pesticides are increasingly using a *risk-based approach*. In February 2005, the federal government (which is responsible for setting product standards) initiated a pesticide risk reduction programme whose main objective is to reduce risks associated with the use of agricultural pesticides by 25% and of biocides by 50% by 2010 (base year 2001). The programme defines a pesticide risk indicator called "PRIBEL" that takes account of seven different human health and environmental hazards. A risk-based approach is also taken in Flanders where a multiple-risk indicator called "POCER" (Pesticide Occupational and Environmental Risk

Indicator), similar to the PRIBEL, will be calculated every three years. Under the Flemish 2001 Decree on Pesticides, all Flemish government entities must cease the use of pesticides by 2015; the first POCER evaluation indicated that risk had already been halved one year after this objective was adopted (i.e. between 2002 and 2003).

4.2 Dioxins, heavy metals and endocrine disruptors

Belgium met the *North Sea Conferences' targets for reducing emissions to water by* 50% and 70% for 25 of the 37 substances covered. The health risks of the remaining emissions are uncertain, as suggested by the pilot human biomonitoring study of 1999. This study of 200 adolescents (120 girls and 80 boys) measured concentrations of lead and cadmium in blood samples, PCBs and dioxin-like compounds in serum samples, and exposure to PAH, benzene, toluene, and found measurable biological effects at exposure levels well below current standards.

The *exposure of the population to dioxins*, which depends mainly on diet, was substantially reduced during the review period, thanks to measures taken at waste incinerators and ferrous and non-ferrous industries. About 70% of remaining sources involve the household sector (e.g. coal-fired heating in buildings, backyard burning of rubbish) (Vlaamse Milieumaatschappij, 2005a). Data from early 2005 suggest that Flanders might achieve its 2005 target of reducing dioxin deposition to a maximum of 26 pg/m^2/day (Table 6.1). Notwithstanding strong local variations (Table 6.6), dioxin levels in the blood of Belgians are no higher than for other Europeans, as was shown, for example, in a 2002 Walloon study (Fierens *et al.*, 2002). Following some widely reported dioxin-related incidents (Box 6.2), the federal government boosted its capacity to deal with food safety issues in 2001 by consolidating responsibilities for health, food-chain safety and environment within the Federal Public Service (FPS).

Lead levels in the blood of the general population have seen a dramatic decline from an average of 170 µg/l in 1978, to 54.0 µg/l in 1996 and 31.2 µg/l in 2005. Nevertheless, in Flanders some *lead and cadmium* hot spots related to the operations of non-ferrous metal smelters at Hoboken near Antwerp require continuing attention. Although dust emissions from the smelters have been reduced from what they were in the 1970s, lead concentrations found in blood samples from children living and going to school in the area were in 2003 still more than double the normal concentrations. That year, the companies involved agreed to a soil decontamination programme: the children receive regular medical check-ups, and the general public in the region is kept up-to-date through newsletters. Heavy metals were detected in public vegetable gardens in Brussels-Capital in March 2003; the authorities consulted with the gardeners on ways to eliminate health risks (e.g. change of site, switch to flowers).

Box 6.2 **From dioxin crisis to PCB incident**

In 1999, levels of dioxin many times the permissible limit were detected in chicken meat and caused widespread public concern. It turned out that the chickens (as well as other poultry and livestock, mainly pigs) had been given contaminated feed. Mixing *PCB- and dioxin-contaminated oil* with waste vegetable oil had caused the contamination. Approximately 50 kg of PCBs and one gram of dioxins were estimated to have entered the food chain. First known as the "dioxin scandal", the incident was later called the "PCB incident", as PCB proved to be the main contaminant.

The incident prompted a crisis of confidence among European consumers and had *significant economic consequences*, estimated at 0.21% of GDP in 1999 and 0.04% in 2000 by the Belgian Federal Planning Bureau. Withdrawing and destroying large amounts of food from retailers and wholesalers was very costly. For a time, several countries banned all agricultural products from Belgium, and some (including the United States) placed bans on all EU agricultural products. The incident, coming in the wake of the 1996 BSE crisis, also had repercussions for the institutional arrangements in Belgium and beyond with respect to food safety. The Belgian Federal Government created *the new Federal Agency for the Safety of the Food Chain (FASFC)*, and the European Commission boosted the capabilities of its Directorate General for Health and Consumer Protection.

Because the Belgian Red Cross was still holding 800 blood samples taken before the incident, it was possible to evaluate the impact on human blood levels of the contaminants concerned. A *post-contamination study* carried out by the Scientific Institute for Public Health (ISP) using samples from 232 blood donors across the country found a slight but significant increase in the concentration of two dioxin congeners implicated in the incident. However, the absolute level of these two substances was equal to or even smaller than levels observed in non-exposed European populations during the 1990s. Moreover, the concentration of total dioxins decreased and the increase in the two congeners was too small to have an effect on total toxicity. If it is correct to assume that the contamination was evenly spread throughout Belgium, the study did not show the incident to have had an adverse effect on *public health*.

Endocrine disruption is a more recent environmental health concern that is possibly implicated in the reduction of male fertility, anomalies in external genital organs, precocious puberty, and breast, testicle and thyroid cancer. Among the chemicals that are *known or suspected human endocrine disruptors* are: dioxins, PCBs, DDT and some other pesticides, and plasticizers. A first screening (2001) established the presence of substances with xeno-oestrogenic activity in rainwater, surface water, groundwater and waste water in Flanders. The results of additional

human risk assessments indicated that certain risks are possible.[5] While institutes and clinics hold a mass of data, much work is needed to structure the information so it can be used in policy making.

5. Noise Abatement

Noise disturbance is a major environmental factor in a densely settled country like Belgium. Recent surveys indicate that Belgians in all three regions are disturbed by noise, and a Flemish study showed that noise is second only to fine particulates in terms of damage to health expressed in DALY units (Table 6.4). Transport is the dominant source of environmental noise in Belgium, followed by neighbourhood noise and industrial machinery.

Reducing noise calls for a comprehensive approach and involves a wide spectrum of measures such as urban planning, soundproofing buildings, improving road surfaces, installing noise screens, smoothing traffic flows and reducing noise emissions. It also necessitates co-operation among a broad range of stakeholders. Current Belgian measures to control noise will need to take account of EU Directive 02/49/EC relating to the assessment and management of environmental noise, which as a first step requires member countries to draw up, not later than mid-2007, strategic noise maps for agglomerations with more than 250 000 inhabitants as well as for major airports, roads with more than six million passages annually, and railways with more than 60 000 passages annually.

Stricter noise limits on products have been imposed in recent years. Those on trucks and aircraft have had a measurable effect (e.g. Brussels Airport). Setting standards for permissible sound emissions from transport products such as vehicles, tires and aircraft is a federal responsibility. In addition, a 2002 Royal Decree transposes EU Directive 00/14/EC on limiting noise emissions from *22 families of outdoor equipment* (e.g. air compressors, power generators, chain saws, lawn mowers). Early evaluation of different types of equipment showed that a significant proportion (between 10 and 60% depending on type) do not meet standards. The federal government is also attempting to get manufacturers and importers to make voluntary efforts to further reduce noise emissions from the equipment they sell.

In *Brussels-Capital*, a five-year *dedicated noise abatement plan* was adopted in 2000. The plan deals with noise from road, rail and air traffic and uses the WHO guide and limit values for indoor and outdoor areas as a long-term goal. Much was done during the first few years of the plan in terms of building institutional networks and carrying out studies for preventive and curative action. The plan also identified *15 priority hot spots* of which 14 had a noise level in excess of 65 dB(A) (high

annoyance) and 3 had a noise level greater than 70 dB(A). Six of the hot spots are being treated (change of road-surface, building of noise screen, reduction of traffic lanes).

In *Wallonia*, a list of actions (LARES) also anticipates a dedicated noise abatement plan for the region, but as yet no date has been stipulated. The Walloon Ministry of Infrastructure and Transport has identified *350 priority sites requiring attention*. The overall length of major roads with noise levels above 65 dB more than doubled to about 190 km between 1990 and 2004; the length of roads equipped with sound barriers rose from about 35 to 75 km. Rail traffic also is a significant source of noise, notably in the north of the region, and will need to be part of the announced abatement plan.

In *Flanders*, the MINA noise *targets* are the most specific and are expressed as outcomes (Table 6.1). About 18% of the population is subjected to a high degree of noise disturbance. The situation has remained constant over the past years; the 2020 target is 10%. The share of the population exposed to daytime traffic noise (outside, in front of façade) with a Leq (a personal noise exposure level) above 65 dB(A) reached 32% in 2004 (the 2020 target is 15%). Only about 27 km^2 are classified as quiet areas, far from the 2007 target of 300 km^2. Anti-noise measures have until now been limited mainly to enterprises and airports, and there are no provisions for encouraging sound insulation of dwellings.

6. Industrial Accidents

The level of *external safety at industrial sites improved markedly* during the review period, partly as a result of a legally-binding *co-operation agreement signed in 2001 by the federal and regional governments*. The Agreement Concerning the Control of the Risks of Serious Accidents Involving Hazardous Substances transposes the 1996 Seveso II EC Directive and the 1993 ILO Convention No. 174 on the Prevention of Major Industrial Accidents. That co-operation agreement was revised on 1 June 2006 to implement the extension in scope of the Seveso II Directive through Directive 2003/105. Revenue from the *Seveso tax* amounts to about EUR 7 million annually and covers the cost of the administration's activities, such as maintaining the register of Seveso installations, awareness-raising, and emergency management training exercises. Citizens can obtain *information about Seveso installations* through a dedicated website; safety reports of upper-tier Seveso establishments are in the public domain. The co-operation agreement also makes *site owners liable* for the cost of cleaning up and restoring the environment after any major accident. In addition to this agreement, the regions have complementary regulations to prevent and deal with the consequences of large industrial accidents.

Notes

1. Since 1994, the Walloon government and the French Community Commission in Brussels have also carried out some of the French community government's responsibilities for health protection.
2. Given that dose-effect relationships are available only for PM_{10}, $PM_{2.5}$, ozone, total carcinogens, lead and noise, the evaluation was based on limited data.
3. A United Nations study claimed that fine particle pollution reduces life expectancy in Flanders by about two years, i.e. significantly more. The difference may be explained by the fact that the UN figure is based on total death, whereas the Flemish calculations are based on death and illness due to cardio-respiratory diseases and lung cancer only.
4. To compensate VOCs loss, a correction of 1.47 is applied.
5. The bottleneck is the limited availability of data on the exposure of the Flemish population to hormone disrupting substances as well as related health effects.

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7

INTERNATIONAL CO-OPERATION*

Features

- Progress in ratifying international agreements
- Mitigating global warming
- Trade and the environment
- Marine issues
- Environment and Belgian ODA

* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental Performance Review of 1998. It also reviews progress with respect to the objectives of the 2001 OECD Environmental Strategy.

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the environmental performance review of Belgium:

- adopt and implement the comprehensive *National Climate Plan*, taking account of the National Allocation Plan, reviewing reliance on buying credits on external markets and other flexibility mechanisms, and maximising synergies between federal, regional and sectoral policies and measures;
- integrate objectives related to climate change in *energy and transport policies* (e.g. energy efficiency, energy pricing and taxation, transport pricing and taxation);
- enhance protection of *marine ecosystems*, e.g. through creation of new marine nature reserves; continue efforts to reduce pollutant releases into the North Sea, by increasing urban waste water treatment and reducing agricultural run-off;
- strengthen efforts to prevent illegal trade of *ozone-depleting substances and hazardous waste*;
- increase the environmental component of *official development assistance* (e.g. water);
- proceed with pending *ratifications*, including through better co-ordination among Parliaments.

Conclusions

In recent years, Belgium has improved its record in ratifying international agreements and in transposing EU Directives, and has reduced delays in ratification processes as a result of enhanced co-ordination between federal and regional authorities on international issues. Concerning *marine issues*, Belgium initiated "sea-use planning" and the creation of marine parks in its newly designated exclusive economic zone, following ratification of the Law of the Sea in 1999. Aerial surveillance of illegal discharges at sea was extended (Bonn Protocol); the control of ships calling at Belgian ports was improved to comply with the Paris Memorandum of Understanding on port state control; and efforts were made to strengthen oil spill preparedness, response and control. Concerning *trade*, with a very open economy, Belgium actively promotes multilateral approaches to trade/environment issues, implementation of specific multilateral environmental agreements, and an EU policy to import tropical timber from certified forests. Over the review period, CO_2 *emission intensity* decreased and Belgium prepared for timely implementation of the new *EU emission trading scheme*, including by creating a national greenhouse gas registry. A

comprehensive national climate plan is being prepared building on a national burden-sharing agreement. *Belgium's official development assistance* increased from 0.35% of gross national income in 1998 to 0.53% in 2005.

However, integration of *climate change* objectives in energy policy could be strengthened: the impacts of energy pricing and of the energy mix on mitigation should be further assessed, a CO_2 tax is no longer envisaged, and there is a tendency to rely on buying credits on external markets to comply with Kyoto commitments. CO_2 emission intensity is still high by European standards and efficiency gains could be obtained by enhancing co-ordination of regional climate plans. Nitrogen loads in water bodies remain very high, and Belgium still has difficulty complying with the EU Nitrates Directive and *North Sea* commitments to reduce land-based sources of pollution. The share of *official development assistance* devoted to the environment (e.g. water) is low, and efforts should be made to ensure that bilateral and development co-operation by the regions does not erode the national focus on selected countries and sectors. Monitoring and inspection efforts concerning illegal *trade* (ozone-depleting substances, hazardous waste, endangered species) should be stepped up.

♦ ♦ ♦

Because of its size, location and very open economy (exports represent 83% of GDP and imports 80%), Belgium has many physical and economic links with its European partners and beyond. As a result, it attaches great importance to promoting international co-operation in environmental protection. It has very close contacts with its neighbours and strongly promotes European co-operation on environmental matters. It aims at *preventing environmental damage on its territory* as a result of activities carried out abroad (e.g. transfrontier pollution, transfrontier movements of waste) and *avoiding the creation of environmental damage outside its territory* (e.g. in rivers or the North Sea, through trade in endangered species). Belgium supports policies aiming at sustainable development and has strengthened its policies with respect to *global environmental issues*.

1. Performance in Ratifying International Agreements and Transposing EU Directives

During the review period, Belgium achieved *considerable progress in ratifying international environmental agreements*.[1] Since 1997, ratification has been finalised for 37 multilateral agreements, including 23 worldwide agreements and 14 regional

Table 7.1 **Multilateral environmental agreements ratified by Belgium**, 1997-2006

Subject	Agreement[a]	Scope[b]	Year adopted	Year ratified
Long-range transboundary air pollution				
NO_x	Sofia (P)	R	1988	2000
VOCs	Geneva (P)	R	1991	2000
SO_2	Oslo (P)	R	1994	2000
Heavy metals	Aarhus (P)	R	1998	2005
Persistent organic pollutants (POPs)	Aarhus (P)	R	1998	2006
Persistent organic pollutants (POPs)	Stockholm (C)	W	2001	2006
Climate change	Kyoto (P)	W	1997	2002
Ozone depleting substances (Montreal Protocol)				
	Copenhagen (A)	W	1992	1997
	Montreal (A)	W	1997	2004
	Beijing (A)	W	1999	2006
Freshwater				
Transboundary rivers	Helsinki (C)	R	1992	2000
Water and health	London (P)	R	1999	2004
Scheldt-Meuse	Ghent Treaties: Scheldt Treaty and Meuse Treaty	R	2002	2005
Marine issues				
Law of the sea	Montego Bay (C)	W	1982	1998
Deep seabed mining	New York (Ag)	W	1994	1998
Migratory fish stocks	New York (Ag)	W	1995	2003
Oil pollution Fund	London (P)	W	1992	1998
Oil pollution liability	London (P)	W	1992	1998
Salvage	London (C)	W	1989	2004
Whaling	Washington (C)	W	1946	2004
North-East Atlantic (OSPAR Convention)	Sintra (Annex V)	R	1998	2005
Waste dumping at sea	London (P)	W	1996	2006
Pollution from ships (MARPOL Protocol)	London (Annex VI)	W	1997	2006
Transboundary movements of hazardous waste	Geneva (A)	W	1995	2003
Nature				
Desertification	Paris (C)	W	1994	1997
Wetlands	Paris (P)	W	1982	1998
Wetlands	Regina (A)	W	1987	1998
European bats	London (Ag)	W	1991	2003
Biosafety	Cartagena (P)	W	2000	2004
Landscape	Firenze (C)	R	2000	2004
Migratory waterbirds	The Hague (Ag)	W	1996	2006
Other				
Transboundary environmental impact assessment	Espoo (C)	R	1991	1999
Trade in pesticides (PIC)	Rotterdam (C)	W	1998	2002
Access to environmental information	Aarhus (C)	R	1998	2003
Prevention of industrial accidents	Geneva (C)	W	1993	2004
Antarctic Treaty	Madrid (P)	R	1991	2005
Transboundary effects of industrial accidents	Helsinki (C)	R	1992	2006

a) (C): Convention; (P): Protocol; (A): Amendment; (Ag): Agreement.
b) W: Worldwide multilateral agreement; R: Regional multilateral agreement.
Source: FPS Foreign Affairs, Foreign Trade and Development Co-operation.

agreements (Table 7.1). Belgium has now ratified many of the multilateral global and regional agreements (References II.A and II.B). Belgium has also made significant progress in *transposing EU environmental directives* into its national law (Box 7.1). This reflects efforts at both the federal and regional levels in a range of areas (e.g. air, water, waste and nature management, climate change, marine pollution and marine environment, use of environmental impact assessment) (Box 7.2).

Belgium ratified in March 2006 the 1992 Helsinki Convention on the transboundary effects of *industrial accidents*; this will entail preparing on-site and off-site contingency plans. In June 2006, the co-operation agreement to prevent industrial accidents involving hazardous substances, which the federal government and regions had signed in 2001, was extended in scope, pursuant to the EU Directive 03/105/EC. The 1994 Charleville-Mézières Agreements on the protection

Box 7.1 **Progress in transposing EU environmental directives**

Belgium has made *significant progress* in transposing EU environmental directives into its national law. In 2000 Belgium was the last of the EU-15 countries in its notification of national measures to implement the EU environmental directives (with a transposition deficit of 14.5%). In May 2006 it was seventh of the EU-25 (with a *deficit of 0.51%*). Only two environmental directives have not yet been transposed: Directive 03/4/EC on public access to environmental information, and Directive 04/101/EC on establishing a scheme for greenhouse gas emission allowance trading within the European Community (with respect to the Kyoto Protocol's project mechanisms). The rapid progress can be attributed to increased political alertness and strengthened co-ordination and communication among administrations and to Belgium's adoption, at the political level, in 2005, of the principle that the *defaulting authority* (being federal, regional or community) would be made responsible for any sanction levied by the Court of Justice of the European Communities (CJEC).

However, by July 2006 Belgium was subject to 23 open *infringement cases* before the CJEC for lack of transposition, non-conformity of transposition or bad application of EU environmental law. This included non-implementation of CJEC judgments related to the framework for Community action in the field of water policy (00/60/EC), urban waste water treatment (91/271/EC), and nitrates from agricultural sources (91/676/EC). It also included court referrals with regard to assessment of the effects of certain environmental plans and programmes (01/42/EC), public access to environmental information (03/04/EC) and substances that deplete the ozone layer (2037/2000/EC). Belgium was also subject to 12 reasoned opinions and five letters of formal notice.

Box 7.2 **Belgian federalism and international co-operation**

Since 1993, the Belgian Constitution has given the three *regions the authority to sign international agreements on matters for which they have exclusive competence* (e.g. water). As a result, following a preliminary and mandatory procedure within the Inter-Ministerial Conference for Foreign Policy, they can negotiate and implement treaties and engage in international agreements with other countries without involving the federal government or federal parliament. Similarly, the regions may develop their own policies to promote international co-operation on particular environmental issues and may finance certain international environmental activities.

Many areas of environmental co-operation fall under the shared competence of federal and regional authorities. In such cases, treaties are signed by representatives of both the federal and regional authorities or by the federal Ministry for Environment or a representative of the Ministry of Foreign Affairs, who are mandated to sign on behalf of the two levels of government. Ratification is subject to agreement by the federal and regional parliaments (for all regions concerned). Implementation of laws and decrees must be enacted at both the federal and regional levels. This procedure leads to strong involvement of all parties concerned, but also to *unavoidable delays* during negotiation and prior to implementation.

The *federal government has exclusive responsibility* for certain areas of environmental co-operation (e.g. product standards, radioactive waste and protection against ionising radiation, transit of waste across Belgium, civil protection, marine waters). Regional governments are responsible for the implementation of international agreements at the regional level and are closely associated with the preparation of Belgium's international policy, standpoints and positions.

In international organisations and in the European Union, *Belgium speaks with one voice*. To make this possible, numerous meetings are held to co-ordinate the Belgian position at both the technical and policy levels. The Co-ordinating Committee for International Environmental Policy (CCIEP), established in 1995, is the main body for policy co-ordination; it operates on the basis of consensus.

of the Scheldt and Meuse Rivers have been updated in accordance with the EU Water Framework Directive's requirement to seek a co-ordinated approach to managing international rivers; this was done through ratification of the twin Ghent Treaties in 2005. Germany and Luxemburg are now parties to the Meuse Treaty and the Federal Authority is now represented in both the Meuse International Commission (MIC) and the International Scheldt Commission (ISC).

However, Belgium has still not ratified a number of multilateral environmental agreements. In the area of *marine pollution*, this is the case for the 1990 London

Convention on oil pollution preparedness, response and co-operation (OPRC) and its three protocols. In the area of *nuclear safety*, Belgium has signed but not ratified the joint protocol relating to the application of the Paris Convention and the Vienna Convention. Under the 1960 Paris Convention on Third Party Liability in the Field of Nuclear Energy, the operator of a nuclear installation is exclusively liable for accidents at and in relation to that installation. The 1963 Vienna Convention and 1997 Vienna Supplementary Convention provide for additional compensation by public funds, based on financial solidarity between the parties.

Other *agreements of regional scope* have not been ratified. While being subject to the more stringent EU National Emission Ceilings Directive (01/81/EC), Belgium has signed but not ratified the 1999 Gothenburg Protocol to the Convention on Long-range Transboundary Air Pollution (LRTAP), which sets emission ceilings for 2010 for sulphur, NO_x, VOCs and ammonia (Table 2.1). Belgium has neither signed nor ratified the 1993 Lugano Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment.[2] Belgium's environmental legislation does not explicitly provide for compulsory insurance of activities at high risk to the environment, though some insurance companies have voluntarily started to cover environmental damage that could be caused by potentially polluting activities. Belgium has not signed or ratified the 2001 Sofia and 2004 Cavtat Amendments to the 1991 Espoo Convention on Transboundary Environmental Impact Assessment (EIA). Despite heavy traffic through its inland waterways, Belgium has not signed or ratified the 2000 Geneva Agreement on international carriage of dangerous goods by inland waterways.

2. Climate Protection

2.1 Commitments and performance

Belgium ratified the 1997 Kyoto Protocol to the UN *Framework Convention on Climate Change* (UNFCCC) in 2002. Under the protocol and as a result of a burden-sharing agreement within the EU, Belgium should reduce greenhouse gas (GHG) emissions from the base year[3] to 2008-12 by 7.5%. A range of measures to meet the Kyoto emission reduction targets was adopted in 2002 (covering the period 2002-10) (Box 4.3). Each region has prepared its own regional climate plan (in 2001 in Wallonia, and in 2002 in Brussels-Capital and Flanders). In 2006, Flanders launched its second Climate Action Plan for the period 2006-12. A comprehensive national climate change plan is under preparation (Chapter 4).

A recent *public opinion poll* commissioned by the federal Environment Minister revealed that while Belgians are aware of climate change and of the urgent need to take action, they still believe that others should be taking action and are less

convinced about what they can do individually. The survey showed that Belgians see industrial emissions as the main cause of the greenhouse effect and emissions from trucks and cars as the second main cause. The survey respondents gave a relatively low score to household electricity use and heating, although emissions from these sources are playing an increasingly important role. A large percentage of the respondents said the effects of climate change will be noticeable soon in Belgium and 66% said that immediate and urgent measures are necessary.

Trends over the review period

Since OECD's last environmental performance review of Belgium, in 1998, the country has slightly improved its performance in the area of climate change (Table 7.2). CO_2 emission intensities (per unit of GDP, per unit of energy supply) have improved since 1990, though not as quickly as the OECD-Europe average (Figure 7.1), and CO_2 emissions have been decoupled from GDP (Table 4.1 and Figure 2.2). However, by 2004 *total GHG emissions had increased by 0.7%* compared to the base year due to an increase in CO_2 and HFC emissions by 8 Mt and 1 Mt of CO_2 equivalent, respectively. This trend is expected to continue through 2010 (and 2020) (National Climate Commission, 2006).

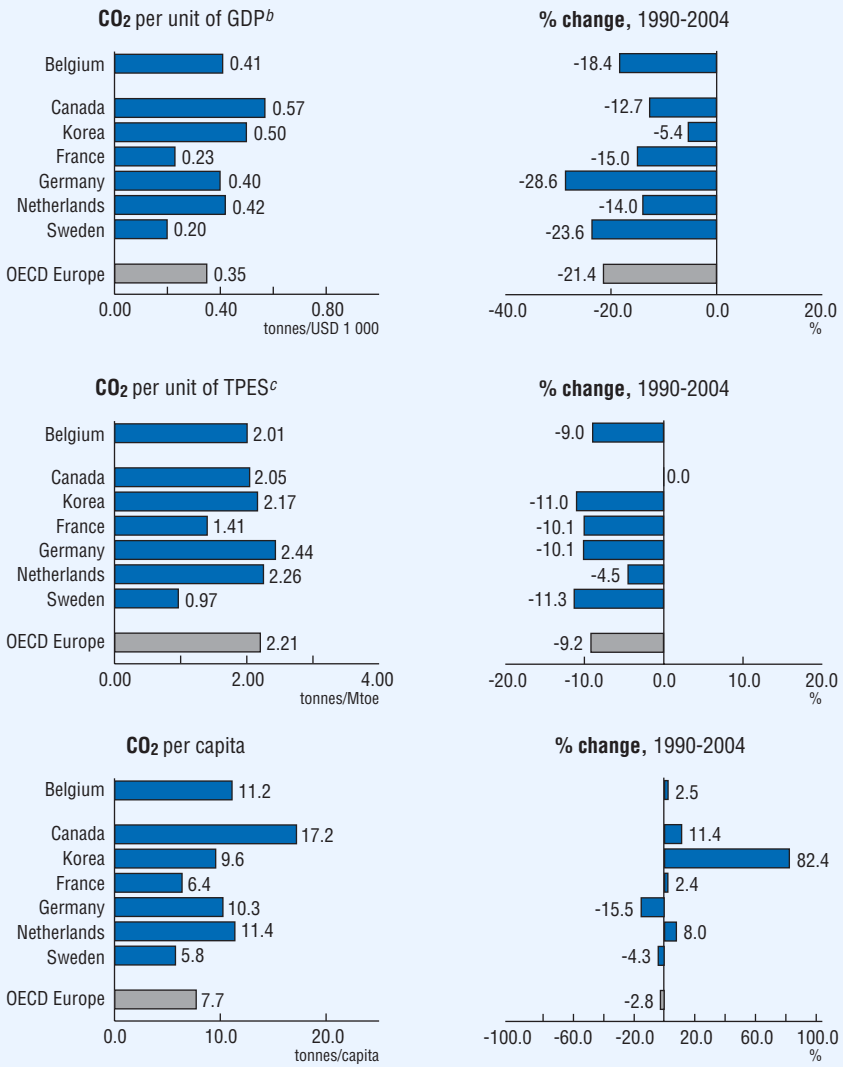
Table 7.2 **Greenhouse gas emissions**[a]

(million tonnes of CO_2 equivalent)

	Base year[b]	1998	2003	2010[c]	2020[c]	2003/base year (% change)	2010/base year (% change)
CO_2	119.0	127.4	126.3	126.6	131.9	*6*	*6*
CH_4	10.8	10.4	8.5	7.9	7.5	*–21*	*–27*
N_2O	12.2	13.3	11.3	11.3	11.1	*–8*	*–8*
F-gas	4.8	1.6	1.6	2.7	3.5	*–66*	*–44*
HFC	0.3	0.7	1.3	. .	. .	*418*	. .
PFC	2.3	0.7	0.2	. .	. .	*–91*	. .
SF_6	2.2	0.2	0.1	. .	. .	*–97*	. .
Total GHG	146.8	152.7	147.7	148.5	154.0	*0.6*	*1.2*

a) Excluding international bunkers and land use change and forestry.
b) 1990 for CO_2, CH_4 and N_2O; 1995 for fluorinated greenhouse gases (F-gas).
c) Forecast under a "with measures" scenario. The 2010 forecast under a "with additional measures" scenario is 145.7 Mt.
Source: National Inventory Report 2005, Report on demonstrable progress (2006).

Figure 7.1 **CO_2 emission intensities,**[a] 2004



a) CO_2 emissions from energy use only; sectoral approach excluding international marine and aviation bunkers.
b) At 2000 prices and purchasing power parities.
c) Total primary energy supply.
Source: OECD-IEA (2006), CO_2 emissions from fuel combustion; OECD (2005), OECD Economic Outlook No. 77; OECD-IEA (2006), Energy Balances of OECD Countries 2003-2004.

Most of the GHG emission increase is (and is expected to continue to be) in the *transport sector* (Table 7.3). In particular, road transportation, which in 2004 accounted for 17.6% of total GHG emissions (an increase of 6.5 Mt of CO_2 equivalent since the base year), is a key source of concern, both in absolute and trend terms (Figure 2.3). Other major contributors are: the residential and commercial sectors, which accounted for 15.6% and 4.2% of total emissions, respectively, in 2004 (+2.6 Mt and +1.8 Mt, respectively, since the base year); the chemicals industry, which accounted for 5.3% of the total (+1.5 Mt); and petroleum refineries, which accounted for 3.5% (+0.8 Mt). Progress made in stabilising or reducing emissions from energy use in public electricity and heat production, iron and steel production, and manufacturing and construction should be pursued as these sectors account for almost 30% of total GHG emissions (16%, 7% and 5% respectively). Trends in emissions from *industrial processes*, such as air conditioning (+1.0 Mt), chemicals (+0.8 Mt) and ammonia (+0.5 Mt) are of concern. Progress was achieved in reducing GHG emissions from *agriculture* though the sector still accounts for 7.7% of total GHG emissions.

Table 7.3 **GHG emissions[a] by sectoral source**

(million tonnes of CO_2 equivalent)

	Base year[b]	1998	2003	2010[c]	2020[c]	2003/base year (% change)	2010/base year (% change)
Energy	113.1	121.0	119.6	120.0	125.1	*5.7*	*6.1*
Fuel combustion	112.3	. .	. .	119.2	124.4	. .	*6.1*
Transformation	30.2	. .	. .	31.9	36.0	. .	*5.6*
Industry	33.6	. .	. .	25.5	25.5	. .	*–24.1*
Transport	20.2	. .	. .	28.6	30.8	. .	*41.6*
Other4[d]	28.1	. .	. .	33.3	32.0	. .	*18.5*
Fugitive emissions	0.8	. .	. .	0.8	0.8	. .	*0.0*
Industrial processes	17.2	15.8	14.3	15.0	16.1	*–16.9*	*–12.8*
Agriculture	12.8	12.7	11.5	11.5	11.0	*–10.2*	*–10.2*
Waste	3.4	3.0	2.0	1.8	1.6	*–41.2*	*–47.1*
Solvent and other product use	0.3	0.2	0.3	0.3	0.3	*0.0*	*0.0*
Total	146.8	152.7	147.7	148.5	154.0	*0.6*	*1.2*
Sinks	–3.1	–2.9	–3.3	–3.3	–3.3	6.5	6.5

a) Excluding international bunkers and land use change and forestry.
b) 1990 emissions for CO_2, CH_4 and N_2O plus 1995 emissions for F-gas.
c) Forecast under a "with measures" scenario. The 2010 forecast under a "with additional measures" scenario is 145.7 Mt.
d) Commercial, residential and agricultural sectors.
Source: National Inventory Report 2005, Report on demonstrable progress (2006).

Flanders accounts for 62% of Belgium's total GHG emissions, Wallonia for 35% and Brussels-Capital for 3% (Federal and Regional Governments, 2006a). In all *three regions*, the energy sector is by far the main contributor, partly due to (increasing) emissions from transport and from the residential and commercial sectors. However, the levels of emissions and their structures and trends differ among the three regions. For example, the residential and commercial sector accounts for nearly 70% of total emissions in Brussels-Capital, whereas the dominant source of emissions in Wallonia is industry, accounting for 27% of the total, and in Flanders the main source is power plants and petroleum refineries, accounting for 27% of the total.

Outlook

Belgium's outlook for meeting its Kyoto commitments is not optimistic. Under the "*with measures*" *scenario*, it is estimated that GHG emissions will increase by about 1.2% by 2010, compared to the target of a 7.5% decrease (Tables 7.2, 7.3). This scenario includes all measures either adopted or under implementation by the end of April 2004, including under the EU emission trading scheme (Directive 03/87/EC). In particular, it includes: measures (adopted in 2004) at the federal level to reduce emissions by 4.8 Mt CO_2 equivalent per year during the 2008-12 period, the Flemish Climate Plan 2002-05 (adopted in 2003), the Walloon Action Plan for Climate Change (adopted in 2001), the Walloon Plan for Sustainable Management of Energy (adopted in 2003), and the Air and Climate Plan adopted by the Brussels-Capital Region in 2002.

In 2004 an *internal burden-sharing agreement* was made by the regional and federal authorities, establishing regional Kyoto targets consistent with Belgium's Kyoto target. In 2003, the distance between actual Belgian GHG emissions and the 2008-12 Kyoto target was 12.4 Mt CO_2 equivalent. Under the EU emission trading scheme, the regions are responsible for issuing GHG emission permits and implementing an allocation plan for installations located on their territory, excluding nuclear plant and safety installations, which are the responsibility of the federal government. The First National Allocation Plan (2005-07) provided for emission reductions of 3.6 Mt, the remaining gap to the Kyoto target (8.8 Mt) having to be filled through additional domestic measures and/or flexibility mechanisms (Table 7.4).

Additional measures to reduce transport emissions, the substitution of wood and biofuels for fossil fuels, the reduction of fluorinated greenhouse gas (F-gas) emissions, and the further reduction of N_2O from nitric acid production would reduce GHG emissions a further 2.8 Mt by 2010 (in addition to the reductions achieved with the "with measures" scenario), i.e. an increase by 0.7% from the base year; but this is still far above the Kyoto target. Belgium therefore intends to use *Kyoto's* "*flexibility mechanisms*" and to purchase emission credits from other countries to achieve the

Table 7.4 **GHG emissions[a] by region**

(million tonnes of CO_2 equivalent)

	1990 emissions	Kyoto target[b] (%)	2003 emissions	Distance to target[c]		
				Total	EU ETS[d]	Other[e]
Wallonia	54.3	50.2 (–7.5%)	50.5	0.3	0.8	–0.5
Flanders	87.9	83.4 (–5.2%)	91	7.7	2.8	4.9
Brussels-Capital	4.0	4.1 (+3.5%)	4.5	0.4	0	0.4
Federal		–	–	2.5[f]	0	2.5
Total	146.2[g]	135.3[h] (–7.5%)	147.7[i]	12.4[i]	3.6	8.8

a) Excluding international bunkers and land use change and forestry.
b) Under Belgium's burden-sharing agreement. In brackets: % change between 2008-12 and 1990.
c) Gap between 2003 emissions and the Kyoto target.
d) EU Emission Trading Scheme for the period 2005-07.
e) Including domestic measures and purchase of emission reductions through Kyoto flexibility mechanisms.
f) The federal government intends to purchase 2.46 Mt/yr to make up the difference.
g) Should be 146.8 Mt when using 1995 as base year for F-gas.
h) Should be 135.8 Mt when using 1995 as base year for F-gas.
i) Numbers do not add up due to differences in methodology to estimate emissions from transport.
Source: National Allocation Plan, 2005-07.

remaining 6 Mt reduction to meet the Kyoto target. These mechanisms form an integral part of the federal (2.5 Mt) and regional (3.5 Mt) climate policies. Regarding the flexibility mechanisms, Belgium's National Climate Commission is the Designated National Authority (DNA) and Focal Point. The priority of both the federal and regional governments is to use the project-based mechanisms, namely Joint Implementation (JI) and the Clean Development Mechanism (CDM). In 2006 the federal and Flemish governments launched their first JI/CDM tender to purchase emission reductions from JI and CDM projects. The Walloon and Brussels-Capital Regions have invested in the World Bank's Community Development Carbon Fund (small-scale CDM projects). If accounted for,[4] carbon sequestration from *land-use, land-use change and forestry* would reduce GHG emissions by 3.3 Mt of CO_2 equivalent by 2010 (Table 7.3).

In 2004 actual Belgian GHG emissions (147.9 Mt) were slightly increased compared to 2003 emissions (Federal and Regional Governments, 2006a). A *draft National Allocation Plan (2008-12)*, submitted to the European Commission in September 2006, projects 2008-12 emissions at 145.7 Mt (instead of 148.5 Mt under the previous "with measures" scenario), taking account of the EU's emission trading scheme allocation and of additional domestic measures (Federal and Regional

Governments, 2006b). The remaining gap to the Kyoto target (10.4 Mt) would still have to be filled through the use of flexibility mechanisms.

2.2 Transport

Transport is the activity that has shown the most dramatic increase in energy consumption and CO_2 emissions during the last ten years, and a recent Federal Planning Bureau study (Gusbin *et al.*, 2004) found that this trend is likely to continue in a "business as usual" context over the next thirty years. In this *reference scenario*, passenger transport is projected to increase by 0.8% annually between 2000 and 2010;[5] the share of private cars would stabilise at 79% in 2010.[6] Over the review period, road freight traffic grew more rapidly than GDP (Table 4.1). Under the reference scenario, in the period to 2010, freight transport is expected to grow at 2.4% pa, and both rail and inland navigation are expected to lose market shares. Improvements in vehicle energy efficiency would not compensate for the growth of transport activity, and energy consumption by the transport sector would increase at a rate of 1% per year (in 1990-2000 the rate was 2.3% per year). The increase in energy consumption would lead to an increase in CO_2 emissions of 0.7% per year over 2000-10.

An *alternative transport scenario*, built on the basis of the EC White Paper on European Transport Policy for 2010, focuses on modal shift and better vehicle loading and occupancy rates. Under this scenario, pricing policies should aim at reverting to the market shares of transport modes in 1998. Passenger transport would shift from private cars to public transportation (including metro, tram and rail). Freight transport would shift towards freight trains and inland navigation, reducing the growth rate of road freight transport. This would in turn result in better vehicle occupancy rates and truck loading factors. The new allocation between transport modes would reduce energy demand from the transport sector by 14%.[7] It would be possible to stabilise total energy-related CO_2 emissions in 2010 at the 1990 level, compared with an increase of about 4% in the reference scenario.

Belgium plans to further internalise external environmental costs differentiation of *vehicle taxation* according to CO_2 (and other) emissions. Higher road fuel taxes could be more efficient. Since 2005, under a scheme intended to encourage the production and purchase of clean cars,[8] the Belgian government has rewarded consumers if they purchase a low CO_2-emitting car. Buyers of new cars for private use emitting between 105 and 115 grams CO_2/km are entitled an income tax relief equivalent to 3% of the purchase price, up to EUR 760, while buyers of the most energy efficient cars (emitting less than 105 grams CO_2/km) are eligible for tax relief equivalent to 15% of the purchase price, up to EUR 4 080. In 2005 this measure applied to only 4% of private car purchases. Reducing the *fuel consumption of new*

cars sold in Belgium could contribute significantly to reducing GHG emissions.[9] Weighted by registrations, the average power (73 kW), average fuel consumption (6.2 litres/100 km) and average CO_2 emissions (157 grams/km) for new passenger cars in Belgium are already below the EU-15 average. This reflects a very high diesel penetration, which is close to 70% (EU average is 40%). It is expected that increasing the biofuel content of transport fuels will reduce CO_2 emissions with up to 1.53 Mt/year in the 2008-12 timeframe.[10]

2.3 Energy

The outlook for the *energy mix* could be strongly influenced by the 2003 Act on the gradual nuclear phase-out. This raises the issue of increased dependency on external supply but also of increased CO_2 (and methane) emissions. Assuming a total phase-out by 2030, the share of natural gas in total primary energy supply (TPES) would gradually increase from the current 14% to 40% (IEA, 2005). The share of oil would remain at 24%, coal would decline (from the current 6%), and the share of renewable sources would rise from 1.2 to 4%. Belgium's indicative target for the share of electricity from renewable energy sources in 2010 is 6%.[11] The actual share has increased to 2.3% over the last five years.

Energy intensity (energy supply per unit of GDP) in Belgium is higher than the OECD and OECD-Europe averages (Figure 4.2). Measures to improve *energy efficiency* have included fiscal incentives (buildings, passenger vehicles), voluntary approaches (industry) as well as regulatory measures and trading mechanisms (combined heat and power) (Chapter 4).

For sectors that are not regulated through the EU emission trading scheme, carbon taxes could be considered, with levels set at the international market price for emission permits. In 2001 the Federal Planning Bureau reviewed the *environmental impact of rising energy prices* (Bossier *et al.*, 2002). Four scenarios were envisaged. The first was to adjust the various energy taxes (excise duty, other specific taxes and VAT) with levels in neighbouring countries (France, Germany and the Netherlands). Second was to apply a carbon tax of EUR 11.5 per tonne of CO_2 (at 1990 prices) to all energy products. Third was to impose a similar tax but with a rate of EUR 26.2 per tonne (at 1990 prices), which corresponds to the equilibrium price for emission rights. Fourth was to tax only road fuels at a rate of EUR 20.33 per tonne of CO_2, equivalent to an increase in fuel prices of EUR 0.07 per litre. The study revealed that, compared with a business-as-usual scenario, such measures would reduce CO_2 emissions by, respectively, 3%, 5%, 10% and 1%. The study thus showed that even extensive fiscal measures such as comprehensive CO_2 taxes would be insufficient on their own to meet the Kyoto commitment.

The issue of *harmonising energy taxes* has long been on the table in the EU[12] including in 2001, under Belgium's presidency. Prior to the 2005 launching of the EU emission trading scheme, the issue was a high political priority because it was viewed as a prerequisite for the EU to meet its Kyoto Protocol commitments. Increasing excise taxes on fossil fuels would have created incentives for reducing fossil fuel consumption and the resulting GHG emissions. Since then, the creation of the EU emission trading scheme has been a focus of EU negotiations.

3. International Trade and the Environment

With its very open economy, Belgium seeks to avoid obstacles to international trade and favours multilateral environmental agreements (MEAs) rather than unilateral measures to protect the environment. In the area of chemicals, for example, Belgium has supported adoption of uniform rules in the framework of the OECD and the EU.

Concerning enforcement of specific MEAs, under the terms of a 2002 circular of the College of General Attorneys to the Appeals Court, the *federal police* are in charge of controlling large-scale traffic in the areas of waste, nuclear energy and protected fauna and flora. The National Safety Plan 2004-07, which addresses environmental crime, gives highest priority to controlling waste traffic. To create synergies between the various parts of the police force, a structured network of information exchange was created, involving 532 members from district legal services, police forces in charge of road, rail and inland water traffic control, and local police. Such an integrated approach, however, does not apply to trade in endangered species, which is given lower priority and where action is taken (by the federal or local police)[13] only upon complaint or denunciation. In 2004 the federal government asked the College of General Attorneys for advice on the usefulness of creating a federal commission on prosecution of environmental infringements.

3.1 Ozone-depleting substances

Belgium has ratified all amendments to the 1987 Montreal Protocol. It is also committed to following the EU timetable for total elimination of ozone-depleting substances (ODS), which is more stringent than the protocol (Table 7.5). The use and emission of ODS as refrigerants and disinfectants has decreased sharply since 1998, and Belgium barely relies on carbon tetrachloride and methyl chloroform as solvents. However, although efforts have been made to reduce reliance on ODS, Belgium *still imports CFCs* for uses other than those agreed as essential by parties to the protocol.[14] This is especially the case for CFC-11 and CFC-12. In Flanders the

Environmental policy Plan 2003-07 (MINA 3) set a target to reduce ODS emissions by at least 70% by 2007 as compared to 1999; the target is expected to be met.[15]

Belgium produces no ODS other than *HCFCs*, and its HCFC import quotas are established at EU level. Belgium's use of HCFCs to replace CFCs in cooling equipment decreased by 89% (in ozone-depleting potential equivalent) between 1998 and 2004, in an effort to meet the 2010 EU phase-out target. As of 1 September 2006, the use of *methyl bromide* was totally phased out, except for quarantine and pre-shipment (QPS) and on the condition that at least 80% be captured, reused or destroyed under safe and controlled conditions. ODS are being replaced, in part, by *fluorinated gases* (HFC, PFC, SF_6), which contribute to global warming and therefore fall under Belgium's climate change policy (Table 7.2). The 1997 Montreal Amendment, which Belgium ratified in 2004, bans the export of used, recycled or reclaimed ODS except those to be destroyed.

Table 7.5 **Emissions of ozone depleting substances,**[a] 1998-2004

(tonnes of ozone-depleting potential equivalent)

		Control measures under the Montreal Protocol				EU schedule[b]	Emissions	
Annex/Group	Substance	Agreement[c]	Baseline	Freeze	Phase out[d]	Phase out[d]	1998	2004
A/I	CFCs	Montreal (P)	1986	1989	1996	1995	121	61
A/II	Halons	Montreal (P)	1986	1992	1994	1995	0	0
B/I	Other CFCs	London (A)	1989		1996	1995	0	0
B/II	Carbon tetrachloride	London (A)	1989		1996	1995	4	3
B/III	Methyl chloroform	London (A)	1989	1993	1996	1995	0	0
C/I	HCFC consumption	Copenhagen (A)	1989[e]	1996	2030	2010	376	42
C/I	HCFC production	Copenhagen (A)	1989[f]	2004		2025	. .	. .
C/II	HBFCs	Copenhagen (A)	No[g]		1996	1995	0	0
C/III	Bromochloromethane	Beijing (A)	No[g]		2002	2000	. .	. .
E/I	Methyl bromide	Copenhagen (A)	1991	1995	2005	2005	95	58
Total							596	164

a) Refers to consumption unless otherwise indicated. Consumption refers to production plus imports less exports and destroyed quantities.
b) Regulation (EC) 2037/2000 of the European Parliament and of the Council on Ozone Depleting Substances.
c) (P) Protocol; (A) Amendment to the Protocol.
d) The phase-out schedules cover both production and consumption.
e) 1989 HCFC consumption +2.8% of 1989 CFC consumption.
f) Average of 1989 HCFC production +2.8% of 1989 CFC production and 1989 HCFC consumption +2.8% of 1989 CFC consumption.
g) Phase-out without intermediate reduction targets and hence without baseline.
Source: FPS Health, Food Chain Safety and Environment.

3.2 Persistent organic pollutants

In 2002 Belgium ratified the 1998 *Rotterdam Convention on* "*prior informed consent*" (PIC), whose objective is to regulate the imports of 22 pesticides and 5 dangerous chemical substances that are widely prohibited or strictly controlled, including 7 of the 12 persistent organic pollutants (POPs) covered under the Stockholm Convention. The (voluntary) PIC procedure is a means of officially knowing the decisions of individual countries about whether or not to accept imports of the listed pesticides and chemical substances in the future. *Most obligations imposed by the 2001 Stockholm Convention have already been transposed* in Belgian (and EU) legislation and are now mostly relevant to developing countries (Box 7.3).

Box 7.3 **Progress in controlling persistent organic pollutants**

The objective of the 2001 *Stockholm Convention*, which Belgium ratified in May 2006 is to protect human health and the environment from persistent organic pollutants (POPs). The convention prohibits production of eight pesticides and PCBs, limits production of a ninth pesticide (DDT), and aims to minimise substances produced unintentionally (e.g. during waste incineration, metal manufacturing, or from mobile sources) such as dioxins, furans, hexachlorobenzene and PCBs. Belgium neither produces nor uses any of the nine pesticides,[a] and thus has already fulfilled the convention's objectives at the federal level. Concerning PCBs, EU Directive 96/59/EC provides for their elimination and a Royal Decree of 1986 prohibits their marketing, export, import and transit (as provided for under the Rotterdam PIC Convention). Throughout Belgium, refineries have already dismantled their tetra-ethyl lead units which emitted dioxins and furans during combustion of leaded gasoline (an objective of EU Directive 98/70/EC relating to the quality of petrol and diesel fuels). The federal government set a maximum level of PCBs in fuels in 2001, at the time of transposing EU Directive 99/32/EC on sulphur in fuels. However, most efforts to eliminate dioxins, furans, hexachlorobenzene and PCBs fall within the responsibility of the regions and will have to be carried out at the regional level. The cost of implementing the necessary measures will be shared between the regions and the federal government.

A new EU regulation on POPs[b] in 2004 led Belgium to *strengthen domestic enforcement*. Non-compliance is subject to imprisonment of eight days to three years and/or a fine of EUR 160 to EUR 4 million, pursuant to the 1998 law on product standards which was recently amended to include POPs.

a) Aldrine, chlordane, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex, toxaphene and DDT.
b) Regulation (EC) 850/2004, which goes a step beyond prior EU commitments (Directive 79/117/EC), e.g. in the area of disposal of wastes containing POPs, and also by waiving all exemptions applicable to small-scale applications.

Belgium is also a party to the *Aarhus POPs Protocol to the LRTAP Convention*, which came into effect in October 2003 and which prohibits the production and use of eight pesticides covered by the Stockholm Convention plus chlordecone and lindane. The Aarhus POPs Protocol severely restricts the use of DDT, HCH (including lindane) and PCBs and provides for the phase-out of DDT and PCBs by 2010. Emissions of unintentional by-products (dioxins, furans, hexabromobiphenyl and PAHs) must be reduced to their emissions level in 1990 (or in a year between 1985 and 1995). The regional governments are responsible for implementing measures to achieve these reductions. The 13 other substances are "old" pesticides, whose production and use has long been prohibited in Belgium. Three products remain of concern, however: PCBs, lindane (still used in veterinary medicine) and hexabromobiphenyls (about which little information on current use is currently available). Air and water emissions of dioxins, lindane, DDT, hexachlorobenzene and PAHs are subject to reduction commitments under the *North Sea Conference* (Figure 7.2) and under EU legislation.

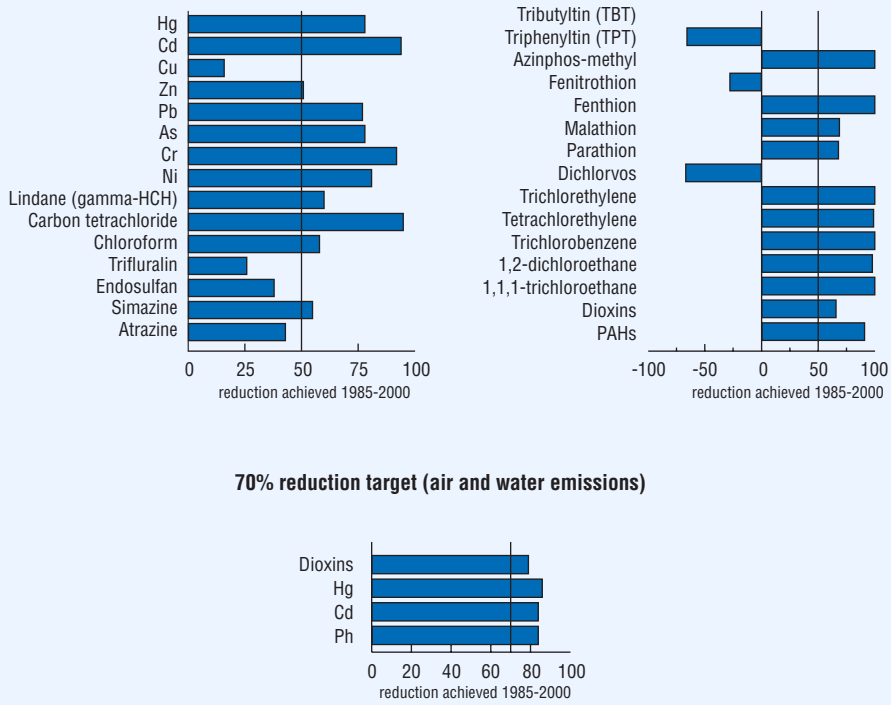
In Belgium, the federal government is responsible for pesticide registration. At the regional level, programmes to reduce pesticide use have existed for years. However, it was not until 2005, pursuant to the 1998 law on product standards, that a *federal programme to reduce use of agricultural pesticides and biocides* was adopted. A key objective is to reduce the negative impacts of pesticide use in the agricultural sector by 25%, over the period 2001-10. A first assessment is due by the end of 2006.

3.3 Hazardous waste

Belgium implements the *1993 EU Council Regulation on the supervision and control of shipments of waste* ("shipment regulation") within, into and out of the European Union.[16] In particular, under the regulation's Annex II, Belgium has introduced a "green list" of waste allowed to move, subject only to controls normally applied in commercial transactions. Annexes III and IV (amber and red lists) regulate wastes not included in the Basel Convention but whose movement is subject to control. Annex V covers wastes whose export for recovery to non OECD countries is prohibited. All wastes not included in the five annexes are to be controlled, as well as all wastes destined for final disposal. Belgium ratified the 1995 Geneva Amendment to the 1989 Basel Convention in 2003, dealing with the ban of exports to non OECD countries. The ban, which Belgium already implements as part of the EU shipment regulation, applies to exports to non OECD countries of hazardous waste destined both for final disposal and for recovery or recycling.

Although Belgium's reporting to the Basel Convention refers only to trade of hazardous waste within the EU area, increasing quantities of electrical and electronic equipment waste[17] (WEEE) are being shipped from the port of Antwerp to China.

Figure 7.2 **Performance of Belgium in meeting North Sea targets**[a]



a) For heavy metals and micropollutants. Drins, DDT, pentachlorophenol, hexachlorobenzene, hexachlorobutadiene, azinphos-ethyl and parathion-methyl were no longer authorised for pesticidal use before or during 1985, however, some of these are still being used in industrial processes. Since 1985, endosulfan, atrazine and parathion have also been phased out and stocks were allowed to be used through 2003 (for endosulfan and parathion) and 2005 (for atrazine).

Source: Progress Report, Fifth International Conference on the Protection of the North Sea.

Inspections of transfrontier movements of wastes by the Flemish Environmental Inspectorate confirm that shipments of plastic scrap and waste to Asia have increased since 2003. Also, well-known hazardous waste streams to Africa, like end-of-life-vehicles and WEEE, persist. There is no indication that considerable volumes of hazardous waste are being exported for sheer dumping purposes. Some waste streams are exported to developing countries for recycling,[18] although it is likely that a portion

of these shipments is not-recyclable and is therefore dumped or incinerated at the place of destination, such as end-of-life-ships containing asbestos, polluted scrap containing shredder residue ("fluff"), and waste plastics containing organic debris. All efforts should be made to prevent and cease such shipments of non-recyclable hazardous waste.

Generation of hazardous waste in Belgium significantly increased over the review period in both Flanders and Wallonia (UNEP, 2004). Most trade of hazardous waste in Belgium occurs in *Flanders* (Table 7.6). Having adequate treatment facilities, Flanders imports sizable quantities of hazardous waste. More than 60% of the imports originate from the Netherlands. Flemish exports go to various EU countries, with nearly 30% going to Germany. In Brussels-Capital, trade is mostly with the Netherlands (e.g. half of exports). Wallonia's exports go mostly to Germany. In *Wallonia*, trade of hazardous waste increased significantly over the review period, partly reflecting a better monitoring of waste flows. Imports for recovery or recycling[19] increased from 128 000 t in 1999 to nearly 306 000 t in 2004.[20] Most (57%) imports go to cement factories. The increase in imports reflects an increased demand by cement factories, for which waste constitutes a good and increasingly diverse source of energy, which may include animal flour (since 2000), contaminated soils following the Erika oil spill (25 000 t in 2003) or consumer goods unfit for human consumption (45 000 t in 2004). More than 30% of imports aim at recovery of (high value) metals in specialised centres. Wallonia is also equipped to recover used oils (28 000 t imported in 2004). Since 2001, imports of manure have been banned for environmental reasons (soil and groundwater protection); 41 000 t had been imported in 2000. Imports of medical and pharmaceutical wastes to specialised incinerators are on the increase, with nearly 700 t imported in 2004. Exports also

Table 7.6 **Import and export of hazardous waste,** 2003

(metric tonnes)

	Flanders	Wallonia[a]	Brussels-Capital
Exports	470 741	132 013	234 883
Imports	737 258	206 138	10 838

a) Data provided by the Walloon Office for Waste.
Source: Annual reporting to the Basel Convention, DGRNE.

increased, from 102 000 t in 1999 to 280 000 t in 2004.[20] More and more exports (from 20% in 1999 to 70% in 2004) are channelled through collecting centres. The rest is exported directly, including acid solutions after their use for pickling by the steel industry (63 000 t in 2004), an item on the Amber list.

3.4 Tropical timber

Belgium ranks high among OECD countries as an *importer of tropical wood*, though imports of tropical logs decreased from 89 000 m^3 in 1999 to 24 000 m^3 in 2005. A significant part (45% in 2005) of imported tropical logs is re-exported, mainly to EU countries. Well aware of the traded volume, Belgium has taken steps to promote sustainable forestry and combat illegal logging. The Second Federal Sustainable Development Plan (2004-08) includes the target of eliminating illegal timber imports by 2007, and Belgium is seeking an EU position in this area, notably through support of the EU's Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan. Enforcement has consequently been strengthened at Antwerp to prevent the import of illegal harvests from old growth forests, primarily from Indonesia and Cameroon, two of the biggest timber exporting countries to Belgium. Another target of the Federal Sustainable Development Plan is the development of a new public procurement policy to promote the use of sustainable timber by federal authorities. This policy came into action in March 2006. Belgium also participates actively in the International Tropical Timber Organisation (ITTO) and was involved in several International Tropical Timber Agreement (ITTA) negotiations (latest in 2006).

Belgium has also long been engaged in *preventive actions*. Although its forest projects portfolio has slightly decreased in recent years, Belgium's development co-operation policy still supports a number of large-scale projects aimed at combating deforestation and forest degradation. Special efforts are made to help protect forests of the Congo Basin, the second largest primary forest area in the world (after Amazonia), yet seriously threatened by commercial logging. At the Johannesburg summit, Belgium pledged EUR 1.75 million to that effect, to be spent over four years. At COP-7 of the Convention on Biological Diversity, Belgium made a commitment to try to prevent illegal exploitation and trade of products coming from protected areas and areas of ecological interest.

3.5 Genetically modified organisms

The *Cartagena Protocol on biosafety* came into force in 2004 in Belgium, with the Federal Public Service for Health, Food Chain Safety and Environment as the national focal point. The Protocol's main objective is to avoid negative impacts on biodiversity

and on human health resulting from transboundary (intentional and non-intentional) movements of genetically modified organisms (GMOs). It is not subordinate to World Trade Organisation (WTO) agreements, but recognises that trade and environment agreements should be mutually supportive. Implementation (by exporters and importers of GMOs) of the Protocol involves the advanced informed agreement procedure (based on scientific risk assessment), documenting transboundary movements of GMOs, and providing information to the biosafety clearing house (BCH). Belgium's national focal point for the BCH (Service of Biosafety and Biotechnology of the Scientific Institute of Health) is recognised internationally as a model, having gained experience from a previous Belgian biosafety server launched in 1996. With financial support from the Directorate – General for Development Co-operation, a training programme for the use and development of national BCH has been organised since 2003, intended for webmasters of developing countries.

GMO field trials in Belgium were phased out in 2000 with the entry into force of the relevant EU regulations (they had previously peaked at more than a hundred per year). However, GMO pre-development in confined media remains common in Belgium, in view of their export for field trials, mainly to Argentina and the United States. Although the importing country is the main decider on whether to allow transboundary movement, *Belgian customs will verify that no unauthorised GMO leaves the country*. To do this, customs employees need specific training to help them better prepare the documentation that accompanies GMOs in their transboundary movements, as required by decisions of the meetings of the parties to the Protocol (in 2004 and 2006) and by EU regulation 1946/2003/EC on the transboundary movements of GMOs. In particular, they should be able to control the conformity of identification codes with the BCH. Belgium is finalising legislation with a view to apply sanctions to exporters in case of violation of their obligations.

4. Marine Issues

4.1 Pollution from land-based sources

In 2005 Belgium ratified Annex 5 of the 1992 Paris *Convention for the Protection of the Marine Environment of the North-East Atlantic* (OSPAR),[21] which includes strategies on hazardous substances, radioactive substances, eutrophication and protection of marine ecosystems. Like other convention parties, Belgium must move towards eliminating inputs of hazardous substances from human activities to the sea "within one generation" (i.e. by 2020). Adoption of OSPAR Annex 5 also calls for Belgium to speed up efforts in creating marine parks, an area where little has been done so far (Chapter 4).

Belgium's primary sources of land-based pollution are effluents from municipalities and industries located in coastal areas, and agricultural waste. At the North Sea Conference in London in 1987, the countries of the North Sea adopted the goal of reducing *nitrogen and phosphorus inputs* by 50% over the period 1985-95[22] in areas where these inputs are likely, directly or indirectly, to cause pollution. At the subsequent ministerial conferences in The Hague (1990), Esbjerg (1995), Bergen (2002) and Gothenburg (2006), the parties reiterated these reduction targets and agreed there was a need to take action against waste water discharges and losses from agricultural runoff. Like the other parties,[23] Belgium has met the phosphorus target[24] but not the nitrogen target. Agriculture and sewage treatment are still the major sources. Major investments have been made, and more are planned, to improve urban waste water treatment infrastructure. EU requires Belgium to delineate new vulnerable areas under the EU Nitrates Directive, including in coastal areas potentially subject to eutrophication (Chapter 4).

At its ministerial meeting in The Hague in 1990, the North Sea Conference also set a 50% reduction target for 36 *hazardous substances* (metals, solvents, pesticides, dioxins), and a 70% target for the most hazardous ones. Belgium has made good progress in reducing discharges for most hazardous substances (Figure 7.2, Chapter 2). North Sea Ministerial Declarations are not legally binding but are a strong statement of political intent and have a track record of propelling signatories into concerted action and binding legislation.

Within the coastal plain (66 km long and 10-15 km wide) and the Belgian part of the North Sea (3 600 km^2), the Belgian coastal zone includes the tide area (4-metre range on average), beach area and a small strip of dunes protecting the beach. The Belgian beaches are for the most part owned by the Flemish Region (Administration of Sea and Watercourses, AWZ), with the exception of a few small privately-owned strips of beach, granted for historical reasons. AWZ concedes sections of beach to municipalities for recreational purposes; these concessions are reviewed on a yearly basis. Where and which type of construction is allowed is stipulated in the Provincial Spatial Executive Plans adopted by the Flemish Government in late 2005. This concerns construction for coastal recreation (e.g. sailing clubs) but not for private housing, which is not allowed on the beach. The dunes still contain a fair amount of privately-owned land. However, development of the dunes is prohibited by the 1994 Dunes Decrees. *Integrated Coastal Zone Management* (ICZM) promotes policy integration and stakeholder involvement (fisheries, municipalities, etc.), pursuant to EU Recommendation 02/413/EC. ICZM is implemented by a Co-ordination Centre, which is a partnership between the Federal Environment Ministry, the Flemish Ministry for Environment and Public Works and the province of West-Flanders.

4.2 Pollution from ships

The Belgian coast lies in the continuation of the Dover Strait, one of the busiest shipping routes in the world, crossed by some 250 vessels a day. Heavy maritime traffic can be observed moving towards the Belgian ports of Ostend, Zeebruges, Ghent and Antwerp, or to other large European harbours such as Rotterdam and Hamburg. Among the primary sources of sea-based pollution of the marine environment is *waste dumping from boats*. Belgium's 2006 ratification of the 1996 London Protocol to the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Dumping Convention), lengthens the list of materials that should not be dumped at sea from vessels, aircraft, platforms or other man-made structures. However, Belgium has not yet ratified the 2001 London Convention on the control of harmful anti-fouling systems on ships.

Being highly exposed to *pollution risks from shipping*, Belgium ratified in 2006 the 1997 Protocol to the 1973 International Convention for the Prevention of Pollution from Ships, as modified by its 1978 London Protocol (MARPOL 73/78), which should further restrict contamination of the sea (as well as land and air) by ships. Belgium ratified in 2004 the 1989 London *Convention on Salvage*, which rewards actions to prevent a major pollution incident (for example, by towing a damaged tanker away from an environmentally sensitive area).

However, Belgium has not yet signed the 1990 London *Convention on Oil Pollution Preparedness, Response and Co-operation* (OPRC) and its 2000 Protocol on pollution incidents by hazardous and noxious substances. Nevertheless, positive developments have taken place (Box 7.4).

While it has ratified the 1976 London *Convention on Limitation of Liability for Maritime Claims* (LLMC), which applies to ship owners, Belgium has not signed or ratified its 1996 London Amendment which raises the financial limits of liability for loss of life or personal injury, and for property claims (such as damage to other ships, property or harbour works) and also introduces a "tacit acceptance" procedure for updating these amounts. Belgium has denounced the 1969 Brussels *Convention on Civil Liability for Oil Pollution Damage* (CLC), which places the liability on the owner of the ship from which the polluting oil escapes. However, Belgium has ratified the 1992 London Protocol, which increases the limits of liability for gross tonnage ships and widens the scope of the convention to cover pollution damage caused in the exclusive economic zone of a convention party. The protocol also allows recovery of expenses incurred for preventive measures even when no oil spill occurs, provided there was grave and imminent threat of pollution damage. In addition, Belgium has ratified the 1992 London Protocol to the *Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage*

Box 7.4 **Progress in controlling marine oil spills**

The oil spill from the *Erika* tanker off the coast of France raised environmental awareness in Belgium. In the months following the spill, Belgium decided to purchase equipment to control pollution incidents in its own territorial waters. EUR 2.5 million were allocated for that purpose in 2001-02, i.e. enough to deal with a 1 000 m^3 oil spill. The equipment includes floating booms, skimmers and storage tanks adapted to recover oil on the open sea, in coastal waters and from the water's edge. Partnerships for logistical support have been established with the civil protection services (ports and beaches) and with the Flemish Region and the Ministry of National Defence (marine waters). Scientific support for risk assessment as well as for use of dispersing chemicals is provided by the Management Unit of the North Sea Mathematical Models and the Scheldt estuary (MUMM), a department of the Royal Belgian Institute of Natural Sciences, a federal scientific establishment that comes under the Federal Science Policy. The MUMM surveillance aircraft can drive pollution recovery units as well as visually assess the impact on the marine environment. Training in prevention is carried out at the national level and within the framework of the 1983 Bonn Agreement for co-operation in dealing with pollution of the North Sea by oil and other harmful substances.* If an environmental incident occurs at sea, the *North Sea Disaster Plan*, presided over by the governor of Western Flanders, is activated. The Belgian Navy's operational command centre (COMOPSNAV) in Zeebruge is the international contact point under the Bonn Agreement. International emergency messages are transmitted to the Marine Rescue and Co-ordination Centre in Ostend, which may decide to implement the emergency plan, depending on the gravity of the incident.

On 14 December 2002 the car carrier *Tricolor* sank in the Channel, in French waters. In the months to follow, oil spilt from this ship and from other ships that were damaged due to the accident fouled thousands of seabirds wintering in the area off the Belgian coast, including in the Flemish Banks, a Ramsar area. More than 9 000 oiled birds washed ashore in early 2003, mainly on beaches bordering this Ramsar area. This was the *largest oil incident* ever reported in Belgian waters.

* The members of the Bonn Agreement are Belgium, Denmark, the European Community, France, Germany, the Netherlands, Norway, Sweden, the United Kingdom and Northern Ireland.

(FUND), which provides additional compensation in cases where compensation under the CLC was either inadequate or unobtainable, while relieving the burden imposed on ship owners. Belgium opted not to ratify the (optional) 2003 London Protocol to the FUND Convention, which entered into force in March 2005. The aim

of the protocol is to supplement the compensation available under the 1992 Civil Liability and Fund Conventions (which Belgium ratified) with an additional, third tier of compensation. Belgium has not signed the 1996 London *Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea* (HNS). This convention would make it possible for additional amounts to be paid in compensation to victims of accidents involving substances such as chemicals.

The 1997 Protocol to MARPOL also adds a new Annex VI, which sets *limits on SO_x and NO_x emissions from ship exhaust* and prohibits deliberate emissions of ozone-depleting substances. As a party to the 1965 Convention on Facilitation of International Maritime Traffic (FAL), Belgium should decrease the time *ships spend in port*, which implies a simplification of procedures. The control of ships calling at Belgian ports has improved and complies with the Paris Memorandum of Understanding on Port State Control (29% of ships controlled *versus* the minimum target of 25%). Since 2003 the Flemish Region has implemented the EU directive on port reception facilities for ship-generated waste and cargo residues (00/59/EC). A contribution system was introduced in 2004 in the ports of Antwerp, Ghent, Ostend and Zeebrugge, which has led to a rise in the delivery and treatment of ship-generated waste.

4.3 Fisheries

With an annual fish catch of 24 000 tonnes, primarily of flatfish (sole, plaice), Belgium accounts for *only 0.5% of the total EU catch*.[25] Aquaculture contributes an additional 2 000 tonnes, primarily of common carp and rainbow trout. The review period saw a decrease in the number of Belgian fishing vessels,[26] accompanied by a decrease in the total yearly catch (OECD, 2004). Several fishing grounds had to be closed prematurely in 2002 and 2003. On average, 50 serious infringements of the country's fishing legislation are reported annually. Flatfish fisheries in the North Sea contribute to the waste of natural marine resources with up to 80% of the catch known to be discarded. The associated seabed disturbance by beam trawling delays ecosystem recovery.

Recovery plans have been established for some stocks, involving limitations of the fishing effort and days at sea, as well as multi-annual total allowable catches and quotas. In 2002 access to Belgium's three-nautical-mile zone of territorial waters was restricted to fishing vessels of less than 70 gross tonnes. To better *monitor catches*, a vessel monitoring system (VMS) was installed on 102 vessels in 2003, and transceivers installed on the other 23 vessels, allowing for a near-real time follow-up of positions at sea. Data on fish sales in Belgian auctions (Zeebrugge, Oostende en Nieuwpoort) are complemented by information from the logbooks. The Belgian Navy carries out

inspections of fishing vessels at sea and an aerial surveillance programme is implemented with the authorities in charge of applying the Bonn agreement. Since the formal instatement of an Exclusive Economic Zone[27] and the adoption of a specific law concerning the maritime environment in 1999, the federal and Flemish authorities have joined their coast guard forces, pending possible creation of a European coast guard.

Since 2002, the EU *Common Fisheries Policy* (CFP) has been entirely "regionalised", which means that decisions are now taken at the level of the regional governments of Flanders and Wallonia. In practice, all matters pertaining to marine fisheries are dealt with by the Flemish authorities, while aquaculture – being present in both the northern and southern parts of Belgium – is a matter of consultation between both parties. Belgium receives 1% of EU CFP support through the Financial Investment for Fisheries Guidance (FIFG), equivalent to EUR 37 million over the period 2000-06. Most is used for processing and marketing and for the modernisation of vessels. Support for the construction of new vessels ceased in 2004.

4.4 Protection of marine ecosystems

Belgium has set *policy objectives* for biodiversity and nature conservation in coastal and marine areas. In 1999 it adopted the Marine Environmental Protection (MMM) Act, which seeks pollution prevention and conservation of the North Sea ecosystems and provides for the creation of marine protected areas. The First Federal Sustainable Development Plan (FSDP) identified *overfishing and eutrophication* as the main threats to the Belgian marine environment. The plan provided for marine biodiversity conservation and the restoration of degraded marine areas, and promoted an ecosystem approach to fisheries management (to halt the decline of fish stocks) and integrated coastal zone management. The Second FSDP set a target of designating 45 000 to 50 000 ha of marine protected areas. Belgium was proactive at the 2004 COP-7 of the Convention on Biodiversity (in Kuala Lumpur), which set the ambitious goal of creating, by 2010 for land and by 2012 for the sea, a global network of vast, representative and effectively managed protected areas, at national and regional scales.

Since 2003 development projects in territorial waters have been subject to environmental impact assessment and licensing, as provided for in the MMM Act. To ensure better "*sea use planning*", areas for *sand and gravel extraction* and (offshore) zones for *windmill parks* have been designated. A project to establish sixty windmills 27 kilometres from the coast recently passed the EIA procedure and building will start soon. Bilateral co-operation was initiated with the Netherlands to integrate nature conservation concerns in the project to deepen the maritime route of the Western Scheldt.

So far only two (private) *marine nature reserves* (covering 3 ha) have been established. In September 2005, two Special Areas for Conservation (SACs) under the EU Habitats Directive and three Special Protection Areas (SPAs) under the EU Directive on the Conservation of Wild Birds (the "Birds Directive") were designated by Royal Decree in the North Sea, covering 51 200 ha. Voluntary agreements with user groups would form the basis for management. An inventory of biodiversity-rich ship wrecks is being carried out in the North Sea to regulate their recreational uses. A 2001 Royal Decree protects all bird species in Belgian marine waters as well as species listed by international conventions (such as CITES).

Belgian coastal areas host valuable ecosystems, such as marshes in the South Bay of the North Sea. *Protected areas along the Flemish coast* increased from 435 ha in 1997 to 1 300 ha in 2004. This includes 11 public nature reserves, all of which have a management plan approved by ministerial decree. This progress partly reflects land acquisition by the Flemish government (purchase of 480 ha of coastal dunes between 1998 and 2004). Since 2002, however, the annual budget for land acquisition has stabilised or even decreased. In the acquired areas, existing infrastructure is destroyed before implementing rehabilitation projects.

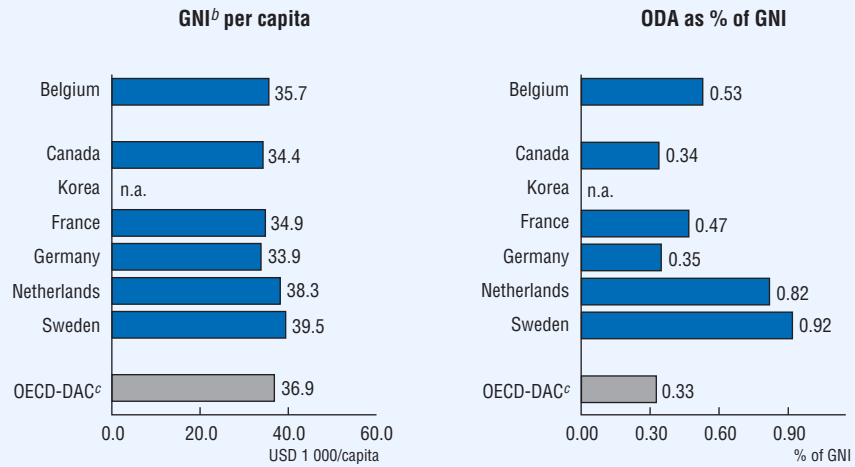
5. Development Aid

5.1 Official development assistance

Belgium's official development assistance (ODA) increased from 0.35% of gross national income (GNI) in 1998 to *0.53% of GNI in 2005*, or EUR 1.4 billion (OECD, 2005). This is well above the OECD Development Assistance Committee (DAC) average (Figure 7.3). Belgium has promised to increase its aid to 0.7% of GNI by 2010, in line with commitments by the world's major countries to raise their aid levels under the Millennium Development Goals. The promise is backed by a legal commitment to increase aid by 0.05 percentage points per year, starting in 2005. Through the 2001 Bonn Declaration, in the context of the UN Framework Convention on Climate Change, Belgium has also committed itself to contributing USD 12 million a year to climate change related activities over the period 2005-07.

Belgian aid is *geographically concentrated* and Belgium is committed to the least developed countries such as the fragile states of Central Africa. The main beneficiary of Belgium's ODA has remained by far the Democratic Republic of Congo (DRC), which received nearly 30% of Belgium's ODA in 2004, despite political instability. Belgium's ten main partners[28] received 41.1% of all Belgian ODA on average in 2002-03, compared with a corresponding average rate for all DAC members of 21.4% (OECD/DAC, 2005). Bilateral ODA is predominant (60 to

Figure 7.3 **Official development assistance,** 2005[a]



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

80% of total ODA since 1999). Nearly 60% of Belgium's ODA goes to least developed countries (the DAC average is 33%).

Environmental protection objectives were included in the 1999 framework law for Belgium's development co-operation policy. Six strategic priorities have been identified: i) sustainable water management; ii) preventing desertification and land degradation; iii) protection and sustainable management of forests; iv) protection and sustainable management of biodiversity; v) better ecological management of urban and suburban zones; and vi) preventing and reducing the effects of climate change. Environmental impact assessments of development projects are carried out when there is threat of major environmental risks.

However, it is difficult to evaluate the attention given to environmental objectives, which Belgium regards as overlapping with objectives for poverty alleviation. Belgian co-operation is still largely characterised by a *project approach*, not a sectoral one. Little aid is devoted to the management of water resources, a key area targeted by the Millennium Development Goals. Water supply and sanitation has

remained at only 2% of Belgium's bilateral ODA since 1998 (the DAC average is 3%). Little has been done to integrate climate change in development co-operation, a priority area identified by the European Union[29] and the OECD.[30] Belgium needs to better evaluate the outcome of its aid systems, in the context of increasing ODA. The decision, in 2000, to devolve development co-operation to regions has not been enforced so far.

5.2 Export credits

Belgium introduced its first formal *environmental impact assessment procedure* for export credit projects in 2002. Under this procedure, EIAs will be done during the underwriting process and will apply to projects above SDR 10 million (except for projects located in a sensitive area), on the basis of international environmental standards. The procedure classifies projects into categories. A project is classified as Category A if it has the potential to have significant adverse environmental impacts. These impacts may affect an area broader than the sites or facilities subject to physical works. Category A should, in principle, include projects in sensitive sectors or located in or near sensitive areas. A project is classified as Category B if its potential environmental impacts are less adverse than those of Category A projects. Typically, these impacts are site-specific; few if any of them are irreversible; and mitigation measures are more readily available. A project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. Category A projects always need an EIA; Category B projects may or may not, depending on the outcome of a questionnaire; Category C projects do not require an EIA. Both environmental and socio-cultural aspects are covered by the screening process.

However, Belgium's experience in undertaking EIA of export credit projects remains very limited. There is no *public access to the EIAs* or information exchange with international financial institutions, as insurance policies contain a confidentiality clause. There is only one consultant to help design the EIAs and train underwriters, and none of the civil servants in charge of export credit are specialised in environmental matters.

Notes

1. The 1998 OECD EPR noted a serious backlog in the ratification process.
2. Though steps have been taken to transpose the EU Environmental Liability Directive (04/35/EC).
3. Belgium's base year emissions are calculated as the sum of the emissions of CO_2, CH_4 and N_2O in 1990, and emissions of fluorinated gases (HFCs, PFCs and SF_6) in 1995; this methodology is allowed by Art. 3.8 of the Kyoto Protocol for Parties included in Annex I.
4. Belgium decided not to make use of Article 3.4 provisions of the Kyoto Protocol (land use and forest management), given the cost of monitoring and the uncertainties about the net CO_2 emissions from land use.
5. This constitutes a significant slowdown of activity in comparison to past trends that can be explained by a rather stable Belgian population and saturated roads.
6. It is currently 78% (Table 2.7).
7. Reduced reliance on road freight transport would contribute most to the energy saving.
8. A 1999 EU directive requires all EU member states to label their cars according to fuel efficiency and carbon dioxide emissions.
9. A 1998 agreement between the European Commission and the European vehicle manufacturers' association (ACEA) is thought to have contributed 15% of the EU's required GHG emission reduction under the Kyoto Protocol.
10. Considering a biofuel content of 5.75% for both gasoline and biodiesel.
11. In accordance with Article 3 of Directive 01/77/EC. In Wallonia, the 2010 target was set at 8%.
12. Any tax issue requires unanimous consent in the Council of Ministers or the European Council to go into effect.
13. It seems that responsibility for enforcing the CITES Convention has often been transferred to the local police, particularly in Wallonia, creating a risk that development interests will override environmental considerations.
14. Even after phase-out, countries are permitted to produce limited quantities of ODS to cover the essential uses for which no alternatives have yet been identified, such as the use of CFCs in inhalers for asthma.
15. Flemish environmental health legislation was amended in 2003 to control the use ODS in refrigerators and air conditioners, including heat pumps.
16. Thereby conforming to the OECD Council Decision on Transfrontier Movements of Waste Destined for Recovery Operations C(2001)107/FINAL.
17. Classified as "dangerous" under the Basel Convention.
18. Pursuant to the 1993 Council Regulation 259/93/EC, the export of hazardous waste and other waste for final disposal to non-EU and EFTA countries is prohibited.
19. Wallonia prohibits all imports destined for final disposal on its territory.

20. Data on waste subject to notification under Regulation 259/93/EC of the Council on the supervision and control of shipments of waste within, into and out of the European Community. This includes hazardous waste but also some non-hazardous waste (e.g. animal flour, sewage sludge).
21. Which entered into force in 1998 to replace the 1972 Oslo Convention on prevention of marine pollution by dumping from ships and aircraft and the 1974 Paris Convention on prevention of marine pollution from land-based sources, both of which Belgium had previously ratified.
22. In 1988, the Paris Commission also adopted a 50% reduction target over a 10-year period for nutrient inputs susceptible to eutrophication.
23. Denmark, France, Germany, the Netherlands, Norway, Sweden, Switzerland and the UK.
24. In 2000, sewage treatment plants and sewerage accounted for 60% of remaining phosphorus discharges, discharges from the industrial sector for less than 10%.
25. The national market depends heavily on imports.
26. The fishing fleet currently consists of 125 vessels with a length above 15 metres.
27. Belgium delineated its exclusive economic zone in 1999, following ratification of the UN Convention on the Law of the Sea (UNCLOS) in November 1998.
28. Democratic Republic of Congo, Tanzania, Serbia and Montenegro, Cameroon, Ivory Coast, Rwanda, Burundi, Bolivia, Burkina Faso and Vietnam.
29. Action Plan 2004-08 to accompany the EU Strategy on Climate Change in the Context of Development Co-operation.
30. Meeting of the OECD Development Assistance Committee and the Environment Policy Committee at Ministerial level (4 April 2006).

Selected Sources

The government documents, OECD documents and other documents used as sources for this chapter included the following. Also see list of websites at the end of this report.

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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 websites

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	100	7713	270	84	**31**	79	43	338
Major protected areas (% of total area)	*2*	8.7	9.2	25.1	17.0	9.6	18.5	32.4	28.0	**3.4**	15.8	11.1	9.1
Nitrogenous fertiliser use (t/km^2 of agricultural land)		2.7	1.1	2.6	8.8	18.9	0.2	2.1	3.5	**10.8**	6.8	7.6	6.0
Pesticide use (t/km^2 of agricultural land)		0.06	0.04	0.08	1.24	1.20	-	0.02	0.09	**0.69**	0.10	0.11	0.06
Livestock densities (head of sheep eq./km^2 of agr. land)		192	256	191	1011	1560	62	685	492	**1790**	287	912	290
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)		31.6	34.0	18.8	24.0	17.9	24.7	18.0	22.0	**30.5**	18.9	22.0	11.9
Birds (% of species known)		12.9	17.0	11.6	12.9	13.3	12.5	21.0	27.3	**28.1**	49.5	13.2	13.3
Fish (% of species known)		7.3	34.4	14.4	25.3	9.2	0.8	10.0	41.7	**23.8**	40.0	15.8	11.8
WATER													
Water withdrawal (% of gross annual availability)		1.5	15.5	19.2	20.3	35.6	6.4	1.7	4.2	**32.5**	11.9	4.4	2.1
Public waste water treatment (% of population served)		72	25	71	64	78	..	80	86	**46**	70	89	81
Fish catches (% of world catches)		1.2	1.6	5.4	5.0	1.9	0.2	0.6	-	**-**	-	1.4	0.2
AIR													
Emissions of sulphur oxides (kg/cap.)		76.3	12.2	49.4	6.7	10.4	126.9	18.6	4.4	**14.6**	22.2	4.5	16.4
(kg/1000 USD GDP)	*4*	2.6	1.4	1.4	0.3	0.6	4.6	0.8	0.2	**0.5**	1.4	0.2	0.6
change (1990-early 2000s)		-27	..	-31	-14	-46	59	39	-55	**-58**	-88	-86	-64
Emissions of nitrogen oxides (kg/cap.)		78.4	12.0	63.9	15.8	24.4	84.2	39.0	24.7	**26.3**	32.3	35.5	40.5
(kg/1000 USD GDP)	*4*	2.7	1.4	1.8	0.6	1.3	3.0	1.7	0.9	**1.0**	2.0	1.2	1.5
change (1990-early 2000s)		-6	18	-19	-2	47	29	16	-3	**-24**	-40	-31	-32
Emissions of carbon dioxide (t./cap.)	*5*	17.2	3.6	19.7	9.5	9.6	17.6	8.1	9.2	**11.2**	11.6	9.4	13.2
(t./1000 USD GDP)	*4*	0.57	0.39	0.53	0.35	0.50	0.63	0.36	0.31	**0.41**	0.71	0.32	0.47
% change (1990-2004)		29	27	20	15	105	36	49	31	**7**	-23	-	25
WASTE GENERATED													
Industrial waste (kg/1000 USD GDP)	*4, 6*	..	..	..	40	40	..	10	..	**50**	50	20	130
Municipal waste (kg/cap.)	*7*	380	320	740	410	390	450	400	550	**470**	280	670	450
Nuclear waste (t./Mtoe of TPES)	*8*	4.0	0.1	1.1	1.6	3.0	-	-	-	**1.9**	1.4	-	1.9

.. not available. - nil or negligible.

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 2000 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
7.5	10.5	3.0	6.2	0.5	8.1	6.0	-	14.6	9.6	4.5	2.6	3.6	3.6	6.0	3.5	3.1	6.8	2.2
0.27	0.17	0.14	0.14	-	0.05	0.58	0.33	0.41	0.08	0.06	0.40	0.16	0.14	0.05	0.10	0.06	*0.21*	*0.07*
514	689	245	207	65	1139	488	4351	2142	845	315	498	226	339	409	794	290	*674*	208
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	2.7	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	37.8	71.1	-	1.8	40.7	51.6	18.6	3.4	14.1	17.7	22.2	26.3	22.4	32.9	22.2	*6.3*	..
19.2	27.3	1.9	18.8	44.0	5.4	18.4	50.0	21.5	7.7	8.6	13.7	14.4	25.5	19.1	36.4	30.8	*15.4*	..
31.9	68.2	26.2	32.1	-	23.1	29.0	27.9	48.9	-	7.0	22.9	24.1	52.9	16.4	38.9	9.9	*11.1*	..
17.5	20.2	12.1	4.7	0.1	2.3	24.0	3.7	9.9	0.7	18.6	15.1	1.4	34.7	1.5	4.7	17.0	*20.8*	*11.4*
79	92	56	32	50	73	69	95	98	73	55	41	53	55	86	97	17	*95*	*64*
0.7	0.3	0.1	-	2.2	0.3	0.3	-	0.5	2.9	0.2	0.2	-	1.0	0.3	-	0.6	0.7	27.9
9.0	7.4	46.3	35.3	35.0	24.5	11.5	6.7	5.3	4.9	38.1	28.4	19.0	37.3	6.5	2.3	31.3	16.9	27.8
0.3	0.3	2.6	2.7	1.3	0.8	0.5	0.1	0.2	0.1	3.6	1.6	1.6	1.8	0.2	0.1	4.6	0.6	1.1
-60	-89	4	-64	22	-48	-63	-80	-58	-58	-55	-9	-81	-29	-45	-60	33	-73	-40
22.7	17.2	28.9	17.7	90.5	31.0	21.8	38.1	26.6	46.9	20.8	27.8	19.0	34.7	27.1	11.4	14.1	26.8	34.3
0.8	0.7	1.7	1.4	3.3	1.0	0.9	0.8	1.0	1.3	2.0	1.6	1.6	1.7	1.0	0.4	2.1	1.0	1.4
-29	-48	11	-24	-2	5	-34	-27	-28	-5	-38	13	-53	14	-25	-46	48	-43	-17
6.4	10.3	8.5	5.6	7.7	10.2	7.9	24.9	11.4	7.9	7.8	5.7	7.0	7.7	5.8	6.0	2.9	9.0	11.1
0.23	0.40	0.45	0.40	0.26	0.31	0.31	0.47	0.42	0.21	0.66	0.33	0.54	0.36	0.20	0.20	0.40	0.33	0.44
9	-12	33	-19	19	37	16	7	18	26	-15	52	-34	59	-	8	63	-4	17
70	20	..	20	-	60	20	..	40	20	140	50	40	20	90	10	30	30	60
540	640	430	460	730	750	520	660	600	700	260	450	300	640	470	660	360	620	550
4.1	1.4	-	1.8	-	-	-	-	0.1	-	-	-	3.1	1.5	3.8	2.1	-	4.0	1.5

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; sectoral approach; 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, 2004 (billion USD at 2000 prices and PPPs)		964	957	10842	3447	921	561	91	241	**285**	168	160
% change (1990-2004)		47.2	49.7	52.4	19.7	116.2	59.5	53.7	35.5	**31.0**	15.1	32.1
per capita, 2004 (1000 USD/cap.)		30.2	9.2	36.9	27.0	19.2	27.9	22.4	29.5	**27.4**	16.5	29.6
Exports, 2004 (% of GDP)		38.2	30.1	10.0	13.1	44.1	18.2	29.2	50.6	**83.5**	71.3	43.5
INDUSTRY	*2*											
Value added in industry (% of GDP)		32	27	23	31	43	26	25	32	**27**	40	27
Industrial production: % change (1990-2003)		42.3	42.2	43.4	-3.2	164.7	29.8	26.9	53.2	**17.6**	3.0	36.1
AGRICULTURE												
Value added in agriculture (% of GDP)	*3*	3	4	2	1	4	4	7	2	**1**	4	3
Agricultural production: % change (1990-2005)		25.6	41.5	27.6	-12.3	19.3	25.4	47.9	9.9	**13.0**	..	0.7
Livestock population, 2005 (million head of sheep eq.)		118	275	787	53	30	283	99	17	**25**	12	24
ENERGY												
Total supply, 2004 (Mtoe)		269	165	2326	533	213	116	18	33	**58**	46	20
% change (1990-2004)		28.5	33.1	20.7	19.6	129.9	32.2	28.2	32.6	**17.5**	-7.1	12.2
Energy intensity, 2004 (toe/1000 USD GDP)		0.28	0.17	0.21	0.15	0.23	0.21	0.19	0.14	**0.20**	0.27	0.13
% change (1990-2004)		-12.7	-11.1	-20.8	-0.1	6.3	-17.1	-16.6	-2.1	**-10.3**	-19.3	-15.1
Structure of energy supply, 2004 (%)	*4*											
Solid fuels		10.6	4.3	23.5	21.8	23.5	42.7	10.7	12.0	**10.2**	44.7	21.5
Oil		36.4	58.1	40.8	47.8	47.6	32.0	39.9	43.3	**40.4**	20.5	41.3
Gas		28.9	26.4	22.1	13.2	11.9	19.6	19.6	23.1	**25.5**	16.6	22.8
Nuclear		8.7	1.4	9.1	13.8	16.0	-	-	-	**21.6**	14.6	-
Hydro, etc.		15.3	9.8	4.5	3.4	1.0	5.6	29.9	21.5	**2.3**	3.5	14.4
ROAD TRANSPORT	*5*											
Road traffic volumes per capita, 2002 (1000 veh.-km/cap.)		10.1	0.7	15.9	6.2	2.3	9.8	11.2	8.3	**8.8**	4.4	8.9
Road vehicle stock, 2003 (10 000 vehicles)		1850	2051	23139	7254	1454	1279	255	490	**544**	409	232
% change (1990-2003)		11.7	107.5	22.6	28.4	328.4	30.8	38.1	32.7	**27.7**	57.8	22.7
per capita (veh./100 inh.)		58	20	80	57	30	64	64	60	**52**	40	43

.. not available. - nil or negligible.

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
145	1650	2109	210	141	9	132	1495	24	446	175	446	181	70	910	258	225	529	1649	29441
31.6	28.1	23.0	48.7	24.4	43.6	144.4	21.3	91.1	36.6	54.6	60.2	34.0	30.7	44.2	31.6	14.0	63.6	39.4	40.9
27.8	27.4	25.6	19.0	14.0	29.9	32.7	25.7	53.3	27.4	38.1	11.7	17.2	12.9	21.3	28.7	30.4	7.4	27.6	25.3
37.1	25.9	38.2	20.2	64.9	36.8	80.2	26.7	146.2	65.4	43.7	39.1	30.9	76.8	27.0	46.2	45.9	28.9	24.7	23.3
32	25	30	23	31	27	42	29	20	26	38	30	29	32	30	28	27	31	26	29
71.3	13.4	9.7	11.7	67.4	..	302.4	11.8	39.3	16.5	33.6	81.5	17.7	10.9	24.1	45.0	19.4	65.9	9.0	26.2
4	3	1	7	4	9	3	3	1	3	2	3	4	5	3	2	1	12	1	3
-3.9	0.9	-4.7	10.1	-10.5	5.4	2.6	10.7	13	-9.2	-9.4	-15.8	1.1	..	7.4	-10.2	-4.3	18.2	-8.0	..
8	156	117	21	12	1	50	64	6	42	9	58	19	6	100	13	12	111	113	2639
38	275	348	30	26	3	15	184	5	82	28	92	27	18	142	54	27	82	234	5508
30.6	21.1	-2.3	37.4	-7.7	61.0	46.1	24.6	33.0	23.1	28.7	-8.1	49.6	-14.0	56.1	13.4	8.6	54.6	10.1	21.7
0.26	0.17	0.17	0.15	0.19	0.40	0.12	0.12	0.20	0.18	0.16	0.21	0.15	0.26	0.16	0.21	0.12	0.15	0.14	0.19
-0.7	-5.5	-20.6	-7.6	-25.8	12.1	-40.2	2.8	-30.4	-9.9	-16.8	-42.6	11.6	-34.2	8.3	-13.9	-4.7	-5.5	-21.0	-13.6
20.0	5.0	24.6	30.1	13.6	2.9	15.1	9.2	2.1	10.8	3.5	58.6	13.0	24.5	14.8	5.5	0.5	27.3	16.1	20.5
29.8	32.8	36.0	57.2	24.9	25.0	58.5	46.2	69.4	39.6	39.7	23.4	59.3	17.4	49.7	28.8	46.1	36.7	35.9	40.7
10.5	14.3	22.6	7.4	45.5	-	24.2	36.6	26.9	45.5	16.7	12.8	12.7	29.7	17.7	1.6	10.0	22.8	37.5	21.7
15.7	41.6	12.5	-	12.1	-	-	-	-	1.2	-	-	-	24.3	11.6	37.5	25.9	-	8.9	11.0
24.0	6.2	4.3	5.3	3.8	72.0	2.2	8.0	1.6	2.9	40.2	5.2	15.0	4.2	6.3	26.5	17.5	13.2	1.6	6.1
9.4	8.7	7.2	7.5	2.3	8.2	8.8	8.3	7.9	7.7	7.3	3.6	6.3	2.4	4.4	8.5	7.8	0.8	8.1	8.2
263	3563	4736	500	320	19	179	3848	33	787	240	1364	542	154	2311	451	406	645	3296	62611
17.6	25.2	27.0	98.1	..	41.5	88.2	28.6	64.7	37.3	23.8	113.2	146.5	56.9	60.0	15.0	25.0	173.2	30.7	33.3
50	59	57	45	32	66	45	66	73	48	53	36	52	29	55	50	55	9	55	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, 2004 (100 000 inh.)		319	1040	2939	1277	481	201	41	82	**104**	102	54
% change (1990-2004)		15.3	28.0	17.6	3.4	12.2	17.8	20.8	5.9	**4.3**	-1.5	5.1
Population density, 2004 (inh./km^2)		3.2	53.1	30.5	338.0	482.8	2.6	15.0	97.5	**340.6**	129.5	125.3
Ageing index, 2004 (over 64/under 15)		72.3	18.6	59.7	140.3	44.4	65.4	54.9	97.1	**97.2**	91.6	79.5
HEALTH												
Women life expectancy at birth, 2004 (years)		82.4	77.6	80.1	85.6	80.8	83.0	81.3	82.1	**82.4**	79.0	79.9
Infant mortality, 2004 (deaths /1 000 live births)		5.3	19.7	6.9	2.8	5.3	4.7	6.2	4.5	**4.3**	3.7	4.4
Expenditure, 2004 (% of GDP)		9.9	6.5	15.3	8.0	5.6	9.6	8.4	9.6	**10.1**	7.3	8.9
INCOME AND POVERTY												
GDP per capita, 2004 (1000 USD/cap.)		30.2	9.2	36.9	27.0	19.2	27.9	22.4	29.5	**27.4**	16.5	29.6
Poverty (% pop. < 50% median income)		10.3	20.3	17.0	15.3	..	11.2	10.4	9.3	**7.8**	4.4	4.3
Inequality (Gini levels)	*2*	30.1	48.0	35.7	31.4	..	30.5	33.7	26.0	**26.0**	25.0	24.0
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, 2004 (% of civilian labour force)	*4*	7.2	3.0	5.5	4.7	3.7	5.5	3.9	4.9	**8.4**	8.3	5.5
Labour force participation rate, 2004 (% 15-64 years)		79.6	59.9	74.9	77.5	67.8	76.1	78.0	79.7	**66.2**	70.6	80.3
Employment in agriculture, 2004 (%)	*5*	2.6	15.9	1.6	4.5	8.1	3.7	7.5	5.0	**2.0**	4.3	3.1
EDUCATION												
Education, 2004 (% 25-64 years)	*6*	84.3	22.6	87.9	84.0	74.4	64.1	77.6	80.2	**63.6**	89.1	81.4
Expenditure, 2003 (% of GDP)	*7*	6.1	6.8	7.5	4.8	7.5	5.8	6.8	5.5	**6.1**	4.7	7.0
OFFICIAL DEVELOPMENT ASSISTANCE	*8*											
ODA, 2005 (% of GNI)		0.34	..	0.22	0.28	..	0.25	0.27	0.52	**0.53**	..	0.81
ODA, 2005 (USD/cap.)		116	..	93	103	..	82	67	189	**189**	..	389

.. 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	603	825	111	101	3	40	582	5	163	46	382	105	54	427	90	74	718	598	11617
4.9	6.3	4.0	9.6	-2.6	14.8	15.4	2.6	17.6	8.9	8.3	0.2	6.4	1.6	9.9	5.1	10.1	27.8	4.4	11.6
15.5	109.8	231.1	83.8	108.6	2.8	57.5	193.1	174.8	391.9	14.2	122.1	114.2	109.8	84.4	20.0	179.0	92.1	244.1	33.2
89.6	88.5	134.5	121.5	98.7	52.2	53.5	133.1	75.3	74.2	74.3	76.9	107.8	66.8	116.0	97.3	100.8	19.4	87.1	70.2
82.3	83.8	81.4	81.4	76.9	82.7	80.7	82.5	81.0	81.4	82.3	79.4	80.5	77.8	83.8	82.7	83.7	73.8	80.7	..
3.3	3.9	4.1	4.1	6.6	2.8	4.9	4.1	3.9	4.1	3.2	6.8	4.0	6.8	3.5	3.1	4.2	23.6	5.1	..
7.5	10.5	10.6	10.0	8.0	10.2	7.1	8.8	8.0	9.2	9.2	6.5	10.1	5.9	8.1	9.1	11.6	7.7	8.4	..
27.8	27.4	25.6	19.0	14.0	29.9	32.7	25.7	53.3	27.4	38.1	11.7	17.2	12.9	21.3	28.7	30.4	7.4	27.6	25.3
6.4	7.0	9.8	13.5	8.2	..	15.4	12.9	5.5	6.0	6.3	9.8	13.7	..	11.5	5.3	6.7	15.9	11.4	10.2
25.0	28.0	28.0	33.0	27.0	35.0	32.0	33.0	26.0	27.0	25.0	31.0	38.0	33.0	31.0	23.0	26.7	45.0	34.0	30.7
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	..
8.9	9.6	9.5	10.5	6.1	3.1	4.5	8.0	4.8	4.6	4.4	19.0	6.7	18.2	10.6	6.4	4.4	10.2	4.7	6.9
74.1	69.6	77.0	64.8	59.2	83.6	71.0	62.2	66.6	78.6	79.4	63.8	76.9	69.4	69.2	77.8	87.3	51.7	75.9	70.9
4.9	3.5	2.4	12.6	5.3	6.3	6.4	4.5	1.3	3.0	3.5	18.0	12.1	5.1	5.5	2.1	3.7	34.0	1.3	6.1
77.6	65.3	83.9	56.2	75.4	60.0	62.9	48.2	62.3	70.7	88.3	50.1	25.2	84.7	45.0	82.9	84.5	26.1	65.1	67.5
6.1	6.3	5.3	4.2	6.1	8.0	4.4	5.1	3.6	5.0	6.6	6.4	5.9	4.7	4.7	6.7	6.5	3.7	6.1	5.8
0.47	0.47	0.35	0.24	..	..	0.41	0.29	0.87	0.82	0.93	..	0.21	..	0.29	0.92	0.44	..	0.48	0.33
171	165	120	48	..	..	168	86	580	314	600	..	35	..	72	363	238	..	179	121

4) Standardised unemployment rates; MEX, ISL, TUR: commonly used definitions.

5) Civil employment in agriculture, forestry and fishing.

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

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

8) 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
1946 Washington	Conv. - Regulation of whaling	Y D	R	R
1956 Washington	Protocol	Y D	R	R
1949 Geneva	Conv. - Road traffic	Y R		R
1957 Brussels	Conv. - Limitation of the liability of owners of sea-going ships	Y S		
1979 Brussels	Protocol	Y		
1958 Geneva	Conv. - Fishing and conservation of the living resources of the high seas	Y S	R	R
1959 Washington	Treaty - Antarctic	Y R		R
1991 Madrid	Protocol to the Antarctic treaty (environmental protection)	Y R		R
1960 Geneva	Conv. - Protection of workers against ionising radiations (ILO 115)	Y	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
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
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
1976 London	Protocol	Y R	R	
1992 London	Protocol	Y 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
1976 London	Protocol	Y R	R	
1992 London	Protocol (replaces the 1971 Convention)	Y R	R	
2000 London	Amendment to protocol (limits of compensation)	Y R	R	
2003 London	Protocol (supplementary fund)			
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
1971 Ramsar	Conv. - Wetlands of international importance especially as waterfowl habitat	Y R	R	R
1982 Paris	Protocol	Y R	R	R
1987 Regina	Regina amendment	Y 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
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

OECD EPR / SECOND CYCLE

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

JPN	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	R	R	R	R	R	R	R	S	R	R	
D		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	R	R	R	R	
R	R	R	R	S	**R**	R	S	R	R	R	R	S			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	
	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	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	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	D	R	D	D	D	D		D	D	D			
R	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	R	R	R	R	R	R	R	R	R	R	R	
D	D	D	D		**R**		D	D	D	D	D		D	D	D		D	D	D	R		D	D	D		D	
R		R	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		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	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	

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

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

		CAN	MEX	USA
1978 Geneva	Amendments	Y R	R	R
1991 Geneva	Amendments	Y		R
1972 Geneva	Conv. - Safe container (CSC)	Y R	R	R
1972 London, Moscow, Washington	Conv. - International liability for damage caused by space objects	Y R	R	R
1972 Paris	Conv. - Protection of the world cultural and natural heritage	Y R	R	R
1973 Washington	Conv. - International trade in endangered species of wild fauna and flora (CITES)	Y R	R	R
1974 Geneva	Conv. - Prev. and control of occup. hazards caused by carcinog. subst. and agents (ILO 139)	Y		
1976 London	Conv. - Limitation of liability for maritime claims (LLMC)	Y	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
1978 London	Annex III	Y R		R
1978 London	Annex IV	Y		
1978 London	Annex V	Y	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	
1994 New York	Agreem. - relating to the implementation of part XI of the convention	Y R	R	S
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
1983 Geneva	Agreem. - Tropical timber	Y R		R
1994 New York	Revised agreem. - Tropical timber	Y R	R	R
1985 Vienna	Conv. - Protection of the ozone layer	Y R	R	R
1987 Montreal	Protocol (substances that deplete the ozone layer)	Y R	R	R
1990 London	Amendment to protocol	Y R	R	R
1992 Copenhagen	Amendment to protocol	Y R	R	R
1997 Montreal	Amendment to protocol	Y R		R
1999 Beijing	Amendment to protocol	Y R		R
1986 Vienna	Conv. - Early notification of a nuclear accident	Y R	R	R
1986 Vienna	Conv. - Assistance in the case of a nuclear accident or radiological emergency	Y R	R	R
1989 Basel	Conv. - Control of transboundary movements of hazardous wastes and their disposal	Y R	R	S

OECD EPR / SECOND CYCLE

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

JPN	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	S	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		R	R	R	R			R		R	R		R	R			
R		R	R		**R**		D	D	R	D	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	R	R	R	R	R	R	R	R	R	R		R	R
				R	**R**	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	S	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	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	S		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	R	**R**		R	R	R	R	R			R	R	R	R	R		R		R	R	R		R	R
R	R	R	R	R	**R**		R	R	R	R	R			R	R	R	R	R		R		R	R	R		R	R
R	R	R	R	R	**R**	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	**R**	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	**R**	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	**R**	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	**R**	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	**R**	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	**R**	R	R	R	R	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

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

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

		CAN		MEX	USA
1995 Geneva	Amendment				
1999 Basel	Prot. - Liability and compensation for damage				
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
2000 London	Protocol - Pollution incidents by hazardous and noxious substances (OPRC-HNS)				
1992 Rio de Janeiro	Conv. - Biological diversity	Y	R	R	S
2000 Montreal	Prot. - Biosafety (Cartagena)	Y	S	R	
1992 New York	Conv. - Framework convention on climate change	Y	R	R	R
1997 Kyoto	Protocol	Y	R	R	S
1993 Paris	Conv. - Prohibition of the development, production, stockpiling and use of chemical weapons and their destruction	Y	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
1994 Vienna	Conv. - Nuclear safety	Y	R	R	R
1994 Paris	Conv. - Combat desertification in those countries experiencing serious drought and/or desertification, particularly in Africa	Y	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
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	R	S
2001 London	Conv. - Civil liability for bunker oil pollution damage				
2001 London	Conv. - Control of harmful anti-fouling systems on ships				S
2001 Stockholm	Conv. - Persistent organic pollutants	Y	R	R	S

Source: IUCN; OECD.

OECD EPR / SECOND CYCLE

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

JPN	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
							S	S	S			S				S							S	S		S	
		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	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	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	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	R	R	R	R	R	R	R	R	R
R	R	R	R	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		R	R	R	R	R	R	R	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	S	R	R
											R				S	R						R	S				
R		S					R	S			R					R		R	R			R	R				
R	S	R	R	R	**R**	R	R	R	R	R	R	S	R	S	S	R	R	R	S	R	R	R	R	R	S	R	R

II.B: SELECTED MULTILATERAL AGREEMENTS (REGIONAL)

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

		CAN	MEX	USA
1933 London	Conv. - Preservation of fauna and flora in their natural state	Y		
1946 London	Conv. - Regulation of the meshes of fishing nets and the size limits of fish	Y		
1958 Dublin	Amendments	Y		
1960 London	Amendments	Y		
1961 Copenhagen	Amendments	Y		
1962 Hamburg	Amendments	Y		
1963 London	Amendments	Y		
1950 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		
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		
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		
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
1964 London	Conv. - Fisheries	Y		
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		
1970 Brussels	Conv. - Benelux convention on the hunting and protection of birds	Y		
1972 London	Conv. - Conservation of Antarctic seals	Y	R	R
1979 Bern	Conv. - Conservation of European wildlife and natural habitats	Y		

OECD EPR / SECOND CYCLE

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

JPN	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	
					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
				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	
									R	R						R	R							R			R
									R	R						R	R							R			R
									R	R						R	R							R			R
									R	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	S	R		R	R	S	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	D		R		R	D	R	R	R	
				R	**R**	R	R	R	D	R	R		R		R	R				D		R	D	D		D	
D	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

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

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

		CAN	MEX	USA
1979 Geneva	Conv. - Long-range transboundary air pollution (CLRTAP)	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	R
1999 Gothenburg	Protocol (abate acidification, eutrophication and ground-level ozone)	Y	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
1980 Bern	Conv. - International carriage of dangerous goods by train (COTIF)	Y		
1982 Brussels	Conv. - Benelux convention on nature conservation and landscape protection	Y		
1982 Paris	Memorandum of understanding on port state control	Y	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		
1991 Espoo	Conv. - Environmental impact assessment in a transboundary context	Y	R	S
2001 Sofia	Amendment			
2003 Kiev	Prot.- Strategic environmental assessment			
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	Y		
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		
1993 Lugano	Conv. - Civil liability for damage resulting from activities dangerous to the environment			
1994 Lisbon	Treaty - Energy Charter	Y		
1994 Lisbon	Protocol (energy efficiency and related environmental aspects)	Y		
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 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 landscape 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

JPN	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			
				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		S	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**	R	R	R	R	R	S	R	S	S	S	R	R	R	S	S	R	S	R	R		R	R
				R	**R**	R	R	R	R	R	S	R	R	S	S	R	R	R	S	S	R	S	R	R		R	R
				S	**S**	R	R	R	S	R	S	S		S	S	R	R	R	S	R	R	R	R	R		S	R
				R	**R**	R	R	R	R	R		R	S	R	R	R	R	R	R	S	R	R	R	R	R		
				R	**S**				R	R			S		S	R	R			S	R		R	R			
				S	**S**				S	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	
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				R	**R**	R	R	R	R	R	R	R			R	R	S	R	R	R	R	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	R		S	R
					R	R	S	R	R	S	S	R	S		S	R	S	R	S	S	R	S	S	S		S	
				S	**S**		S	S			S	R				S		S	S	S				S		S	
					S	R	R	R	R	R	S	R		R	S	S	S	R	R	R	R	S	R	R	R	R	
								S			S		S		S	S	S			S							
R		S		R	**R**	R	R	R	R	R	R	R	S	R	R	R	R	S	R	R	R	R	R	R	R	R	R
R		S		R	**R**	R	R	R	R	R	R	R	S	R	R	R	R	S	R	R	R	R	R	R	R	R	R
					R				R								R										
					R				R								R										
					S				S	S						S											
					S				S	S						S	S							S			
				S	**R**	R	R	R	R	S	R	R	S	S	R	R	R	R	R	R	R	R	R	R	S	R	R
				S	**S**	S	S	S	S	S	S	S		S	S	R	S	S	S	S		S	S	S		R	S
				S	**S**		S	S	S	S	S		S		S	S							S				
									R	R						R	R							R			R
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				R		S			S	S		R			S	S	R				S						

Reference III
ABBREVIATIONS

AEM	Agri-environmental measure
AEWA	Agreement on the Conservation of African-Eurasian Migratory Waterbirds
AMINAL	Environment, Nature, Land and Water Administration (Flemish Region)
BAP	Biodiversity Action Plan
BAT	Best available technology
BOD	Biochemical oxygen demand
CBD	UN Convention on Biological Diversity
CCIEP	Co-ordination Committee for International Environmental Policy
CDM	Clean development mechanism
CITES	Washington Convention on International Trade in Endangered Species of Wild Fauna and Flora
COD	Chemical oxygen demand
DALY	Disability Adjusted Life Years
DGRNE	Directorate General of Natural Resources and the Environment (Walloon Region)
EIA	Environmental impact assessment
EMAS	Eco-Management and Audit Scheme (EU)
ETS	Emissions Trading Scheme (EU)
EU	European Union
FCSD	Federal Council on Sustainable Development
FEN	Flemish Ecological Network
FPS	Federal Public Service
FPSD	Federal Plan for Sustainable Development
FSC	Forest Stewardship Council
GDP	Gross domestic product
GHG	Greenhouse gas
Ha	Hectare
IBGE-BIM	Brussels Environment (Brussels-Capital Region)
ICSD	Interdepartmental Commission on Sustainable Development
IPC	Integrated pest control
IPPC	Integrated pollution prevention and control (EU)

IUCN	International Union for the Conservation of Nature and Natural Resources
JICEH	Joint Inter-ministerial Conference on Environment and Health
kt	Kilotonnes
kW	Kilowatt
LNG	Liquefied natural gas
LPG	Liquified petroleum gas
MINA-plan	Environmental policy plan of the Flemish Government
NEC	National emission ceiling (EU)
NEHAP	National environmental health action plan
NGO	Non-governmental organisation
NMVOC	Non-methane volatile organic compound
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
PAC	Pollution abatement and control
PAHs	Polycyclic aromatic hydrocarbons
PCDN	Municipal plans for nature development (Walloon Region)
PEFC	Programme for the Endorsement of Forest Certification
PGDA	Sustainable nitrogen management programme in agriculture (Walloon Region)
PLUIES	Integrated flood prevention and control plan (Walloon Region)
PM	Particulate matter
SAC	Special Area for Conservation (EU)
SEA	Strategic environmental assessment
SFM	Sustainable forest management
SOE	State of the Environment
SPA	Special Protection Area (EU)
toe	Tonnes of oil equivalent
UNFCCC	UN Framework Convention on Climate Change
VOC	Volatile organic compound
WFD	Water Framework Directive (EU)

Reference IV

PHYSICAL CONTEXT

Belgium is located on the *south-east shore of the North Sea* and shares borders with the Netherlands, Germany, Luxembourg and France. The country covers a total area of 30 528 km^2, of which 13 522 km^2 is in Flanders, 16 844 km^2 in Wallonia and 162 km^2 in the Brussels-Capital Region. Most of Belgium (30 278 km^2) is land. Almost the entire country lies in the basins of the two main rivers, the Scheldt and the Meuse, which enter at the French border and then flow towards the Dutch border. Belgium has 66 kilometres of coastline.

Belgium has a relatively *narrow topographical range*. Three main parts can be distinguished: lower Belgium (up to 100 metres above sea level) includes the flat and fertile polders in the west; central Belgium (100-200 m above sea level) includes densely urbanised Brabant; and the Ardennes or upper Belgium is the most sparsely populated and densely wooded part of the country. The Signal de Botrange (694 m above sea level) is the country's highest point.

Belgium enjoys a *moderate maritime climate* with generally mild temperatures, predominantly westerly winds and an average annual precipitation of less than 800 mm. With the two main rivers adding about 8 billion m^3 of water to the 12 billion m^3 net rainfall (i.e. precipitation minus evapotranspiration), Belgium is relatively *poor in freshwater resources*. Partly owing to the high population density, Belgium's intensity of use of freshwater resources is one of the highest among OECD countries.

Concerning *land cover*, farmland occupies 46% of the total land area (with 28% in arable and permanent crops and 18% in permanent grassland) and forests 22%. The remaining 32% of the territory is mainly built-up and open land. Belgium is criss-crossed by very dense networks of roads (total length 151 000 km^2), railways (3 500 km) and navigation canals (over 1 500 km), which link the major rivers and Antwerp, the world's fourth largest port (in terms of cargo traffic).

Notwithstanding the country's small size, its climatic and geological conditions have created *diverse ecosystems*. These include Atlantic ecosystems (marine, dunes, heaths, marshes, bogs, grasslands, deciduous forests), meridional systems (chalky grasslands, shrubs and forests) and septentrional systems (peatbogs, deciduous forests). Urbanisation and fragmentation place heavy pressure on habitats.

Belgium has *few mineral and energy resources*. Its deposits of iron ore, lead and zinc have been exhausted. The mineral-processing industry, in particular steel production and copper, zinc and lead refining, nevertheless remains a significant contributor to the Belgian economy. The country has indigenous coal resources, but coal mining ceased in 1992 owing to high production costs. Belgium relies on imports of fossil fuels (oil, natural gas and coal) for more than three-quarters of its primary energy supply; renewable energy sources account for less than 2%. In 2003, the Belgian Parliament passed a law to phase out nuclear energy between 2015 and 2025 (nuclear power currently provides 57% of Belgium's electricity).

Reference V
SELECTED ENVIRONMENTAL WEBSITES

Website	Host institution
www.belgium.fgov.be	Belgian Federal Government
www.premier.fgov.be	Prime Minister (Federal)
www.diplobel.fgov.be	Ministry of Foreign Affairs, Foreign Trade and International Co-operation (Federal)
www.environment.fgov.be	Federal Public Service for Health, Food Chain Safety and Environment (Federal)
http://statbel.fgov.be	STATBEL, the Belgian Statistical Agency (Federal)
www.iph.fgov.be	Scientific Institute of Public Health (Federal)
www.climat.be	Climate change
www.mumm.ac.be	Management Unit of the North Sea Mathematical Models
www.isc-cie.com	International Commission for the Scheldt
www.cipm-icbm.be	International Commission for the Meuse
www.ibgebim.be	Brussels Environment (Brussels – Capital)
www.mina.be	Environment, Nature, Land and Water Administration (Flanders)
http://mrw.wallonie.be/dgrne	Directorate General of Natural Resources and the Environment (Wallonia)

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