

# 1

## CONCLUSIONS AND RECOMMENDATIONS\*

This report examines the progress that Luxembourg has made since the last OECD Environmental Performance Review, in 2000, and assesses the extent to which the country has *achieved its national objectives and respected its international commitments*. It also examines Luxembourg's progress in the context of the OECD Environmental Strategy\*\*. The report offers 41 recommendations intended to help strengthen Luxembourg's environmental performance.

Between 2000 and 2007, Luxembourg's economy grew rapidly, by 34%, and its population rose by 9%. In 2008 and 2009, it suffered the effects of the international economic and financial crisis. Luxembourg is the richest country of the OECD, and its economy is dominated by services (mainly banking, insurance, real estate and services to business), which account for 85% of GDP. Pressures on the environment, stemming primarily from consumption (pollution from transportation, waste generation, and land use), are heavy. Luxembourg is also characterised by its international interdependence. First, with its *neighbouring countries*: its economy is highly integrated with those of Belgium, France and Germany in particular and around 90% of its trade is with Europe. Luxembourg's geographical situation and economic development have also made it a focal point in "la Grande Région". More than 40% of domestic jobs are held by non-resident border crossers, and 75% of automotive fuel is sold to vehicles not registered in Luxembourg.

Luxembourg's environmental policies have achieved significant results, but there is room for further progress, particularly regarding sanitation, nature and biodiversity conservation, greenhouse gas emissions, and – more generally – sustainable development. With the current preoccupation over the financial crisis and ways of addressing it, the environment is often viewed in some political debates as a constraint on economic development. To *address these challenges*, Luxembourg will need to: *i*) pay greater attention to cost-effectiveness in implementing its environmental policies; *ii*) integrate environmental considerations more effectively into economic decisions, particularly as they relate to transportation, energy and taxation; and *iii*) pursue and expand its international co-operation on environmental issues.

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\* Conclusions and Recommendations reviewed and approved by the Working Party on Environmental Performance at its meeting on 7 October 2009.

\*\* The objectives of the OECD Environmental Strategy 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) and global environmental interdependence (Section 3).

## 1. Environmental Management

### *Strengthening the implementation and efficiency of environmental policies*

Luxembourg has a very comprehensive set of domestic environmental laws, based largely on European legislation. It currently has a *control and inspection unit for classified facilities* and a mobile inspection unit for enforcing regulations relating to nature and forests. In 2003, the Luxembourg government adopted a *Master Programme for Territorial Planning*, as a physical planning tool at the national level. This programme provides a reference framework for the *master plans for primary sectors* (transport, landscapes, housing, and economic activity zones), which are in the process of adoption. Regulation remains an effective tool for implementing environmental policies, although voluntary instruments are now being used in many sectors. Government funds contribute to public environmental expenditure. They are financed by budgetary allocations (Environmental Protection Fund, Water Management Fund) and by partially earmarked taxes, such as fuel and vehicle taxes (Financing Fund for the Kyoto Mechanisms).

Yet Luxembourg is facing a number of environmental challenges in terms of pollution (waste water treatment, air pollution from NO<sub>x</sub>) and unsustainable patterns of consumption (transport, energy, recreation, space). Its biodiversity and its landscapes are under threat. To address these challenges, *implementation* of environmental policies will have to be strengthened. The principles of "*polluter pays*" and "*user pays*" (especially for waste and water management) should be applied more effectively; greater use should be made of *economic instruments*; and the actual results of environmental policies should be measured more closely. Efforts by the central government and local authorities are not always well coordinated. Luxembourg has a plethora of plans and programmes, but the measures contained in those plans are not sufficiently spelled-out in terms of their costs, timing or budgeting. Luxembourg has been slow to implement certain laws (the Sustainable Development Plan, sectoral master plans) and European directives. For example, there are gaps in Luxembourg's *implementation of the Seveso directive*, which calls for external emergency plans that entail active obligations to notify local residents.

#### **Recommendations:**

- encourage more sustainable *modes of consumption* through regulatory and economic measures and appropriate demand management (for example, in the areas of solid waste, mobility, public and private buildings, land use);
- reinforce the internalisation of external environmental damage; enforce the "*polluter pays*" and "*user pays*" *principles* more effectively (for example in the management of waste, sewage, energy and transport);
- make environmental policies more effective and efficient through the use of *economic instruments* and closer *monitoring of the results* of environmental actions;
- ensure better *coordination of central and local government efforts* to implement environmental and land use policies, including European directives (for example, classified facilities, water management, space and species management);
- continue to implement the law on *strategic environmental assessments*.

#### **Air**

Emissions of *several atmospheric pollutants* have been reduced over the last 10 years (SO<sub>x</sub>, NO<sub>x</sub>, NMVOC). *Emissions of non-methane volatile organic compounds* (NMVOC) should meet the reduction target set by the EU directive on national emission ceilings (NEC) for 2010. SO<sub>2</sub> concentrations have been kept well below the authorised limit value for the protection of human health. Limit values for fine

respirable particles (PM<sub>10</sub>) have never been exceeded. A national target has been set to have 25% of homework commuting covered by public transit by the year 2020.

However, limit values for the protection of human health from *nitrogen dioxide* (NO<sub>2</sub>) are being exceeded in Luxembourg City, primarily because of automobile traffic. Luxembourg is not likely to meet the target for NO<sub>x</sub> emissions set by the NEC directive. Measures will have to be taken to control the main sources of NO<sub>x</sub> (urban heating, industry and transportation). These measures would help prevent the formation of ozone, of which NO<sub>x</sub> are precursors. *Concentrations of ground-level ozone* are regularly above the pre-alert threshold for the protection of human health at several sites. The country has yet to come up with a regional ozone plan. Bio-surveillance programmes for dioxins and furans (PCDD/F) in the vicinity of steel plants indicate that sometimes certain health standards are exceeded.

#### **Recommendations:**

- take more effective steps to reduce *NO<sub>x</sub> emissions* and meet the targets of the EU emission ceilings directive (NEC), including action on energy and transportation pricing;
- estimate the level of absorption of *dioxins and furans* among people living in the steelmaking basin, and reduce their exposure;
- strengthen the benefits of *climate change policy* for emissions of conventional air pollutants;
- pursue efforts to *develop public transport*, so as to achieve the 2020 objective that it covers 25% of home-work commutes.

#### **Water**

A *Water Management Administration* was created in 2004, bringing together various services under the supervision of the Ministry of the Interior and Territorial Planning in order to create an appropriate instrument for integrated water management. A *new water law* consolidates the various pieces of water legislation and transposes the EU water framework directive and floods directive. The law seeks to harmonise the *structure of water pricing* and introduces the principle of full cost recovery for drinking water supply and urban sewage treatment. It introduces *an abstraction tax and a pollution tax*, which are to come into force in 2010. Draft management plans have been prepared for the country's two main river basins. A master programme for managing flood risks will be prepared for the different communes facing such risks. The national nitrogen balance has improved significantly.

*Drinking water sources*, however, have not been protected, despite a legal obligation to do so that dates back more than 15 years. Many *aquifers* have been contaminated by nitrates and pesticides. Implementation of the EU water framework directive will not be easy: at least 40% of *surface water* is likely to fall short of the 2015 EU targets for chemical and biological quality. Only 22% of the population is connected to a tertiary-level *waste water treatment plant*, even though the entire country is classified as a sensitive zone. The legal obligation to recover 100% of water service costs by 2010 will not be met without major pricing adjustments. *Financial assistance to the communes* from the Water Management Fund has been doubled to help them to cover 90% of sewerage and sewage treatment investments. *Rural development policies* have focused more on farm modernisation and the continued use of agricultural land than on targeted protection of water resources.

**Recommendations:**

- implement the new Water Law; in particular, *promote river basin management* through the Water Management Administration and the water district management plans;
- apply the *"user pays" and "polluter pays" principles* to water pricing for households, industry and agriculture; ensure financing for *tertiary-level waste water treatment plants* required by the EU urban waste water directive;
- consider the establishment, on a voluntary basis, of *sustainable management plans at the farm level*, in order to make farmers more accountable for managing inputs, water and biodiversity;
- *strengthen control of drinking water quality*; delineate drinking water protection areas around aquifers and protect them.

***Waste and materials***

Luxembourg has for many years been pursuing an *active policy* of waste and materials management. The *legislative and regulatory framework* is comprehensive, in accordance with European legislation, and there is a *General Waste Management Plan* that sets qualitative and quantitative objectives. There are many activities relating to information, awareness and advice. During the review period, *municipal waste* increased less quickly than GDP (relative decoupling); *collection and recycling rates* also improved, and are among the highest in Europe; and residual mixed waste remained stable. There has been significant progress with *"problem" household and industrial waste*. There is now a legal basis for managing them, and this ensures greater consistency at the national level. Luxembourg industry makes heavy use of *secondary raw materials*, and self-sufficiency is guaranteed for the disposal of municipal waste. Significant progress has also been made with respect to *inert waste*.

*Municipal waste* production per capita, however, is among the highest in the OECD, although cross-border workers contribute to that production. The targets of 30% reduction in specific disposable waste and bulky waste has been missed. Municipal waste management still suffers from a *lack of coherent* planning at the national level, which makes it difficult to exploit synergies. As a result, the quality of sorting is uneven and there is considerable unexploited recovery potential, particularly for organic components and plastics from municipal waste. The *polluter pays principle* is only partially applied, and prices vary among the communes. There has been little progress in managing *waste from the health sector*: it is no longer coordinated, and self-sufficiency is not guaranteed for the treatment and disposal of infectious waste. Despite a survey of *contaminated sites*, there is no plan for rehabilitating them, and there is no assured funding for cleaning-up orphan sites.

**Recommendations:**

- implement the *General Waste Management Plan* with more efficient measures for achieving the principal objectives, and with the necessary financial and other means;
- establish harmonised and differentiated pricing for municipal waste management across the country, based on the *polluter pays principle* and cost recovery;
- achieve *economies of scale* by encouraging communes to cooperate more effectively and coordinate their actions (collection methods, selective sorting, recycling programmes);
- coordinate the management of *hospital* and similar *waste*, in partnership with interested parties in Luxembourg and the neighbouring countries;
- establish a multi-year clean-up and rehabilitation plan for *contaminated sites*, including orphan sites, and specify how they will be funded;
- establish a database in support of a policy to enhance *resource productivity* and identify the best measures for achieving it (e.g. use of new technologies and innovation).

## *Nature and biodiversity*

Luxembourg today has institutional, legislative and financial frameworks for implementing a nature and biodiversity conservation policy. The objectives are spelled out in the *National Plan for Sustainable Development* (1999) and the *National Plan for the Conservation of Nature* (2007). Luxembourg has thus made up for most of its lag in setting the framework for nature and biodiversity conservation. A *registry* of biotopes is now used to identify the most important ones and ensure they are taken into account in land use planning. A natural environment *Observatory* will make it easier to monitor landscape changes that could affect biodiversity. The European *Natura 2000* programme has fostered the protection of natural spaces (which increased from 6.5% to around 17.5% of the national territory during the review period). Initiatives to restore watercourses are contributing to biodiversity and to flood prevention, particularly in the context of agreements signed between the central government and the inter-communal syndicates. There is now more assistance for promoting sustainable forestry practices among private landowners.

However, the number of threatened species is still high and there is continuing pressure on biodiversity caused by fragmentation of the territory, urban sprawl, and transportation infrastructure. Despite a significant increase in protected areas, they are still far from fulfilling their potential to support biodiversity: they have few management plans and many of those that exist are just now being put into effect. The economic services derived from ecosystems (relating for example to climate change, flood prevention and water purification) are generally *underestimated*. *Agro-environmental subsidies*, specified in the EU framework, are not sufficiently utilised, and there is still need for a rural conservation policy that integrates natural habitat restoration into farm management. *Sustainable management of privately owned forests* is still difficult to implement because of the fragmentation of properties.

### **Recommendations:**

- establish *two strong conservation areas* of sufficient size (for example IUCN categories I to III), one in a forest zone and one in a farming area, to serve as *biodiversity reservoirs*;
- develop and implement management plans, enhance biological productivity in the *protected areas* (protected zones, Natura 2000 zones, natural parks, Ramsar zones); establish *biological corridors* linking the Natura 2000 zones in order to facilitate migration of fauna and flora;
- pursue partnerships between the *central government and the communes* on joint conservation and habitat rehabilitation projects;
- make greater use of economic instruments to encourage landowners to *adopt sustainable farming and forestry practices* that will favour biodiversity; develop programmes to pay for the economic services that ecosystems provide, particularly aquatic and forest ecosystems;
- establish *forest management programmes* to rejuvenate the forest so that it can supply biomass for energy production and to enhance its capacity to sequester CO<sub>2</sub>.

## **2. Towards Sustainable Development**

### *Integrating environmental concerns into economic decisions*

Despite its growing GDP and population, Luxembourg has made progress in *decoupling* environmental pressures from economic growth. Generally speaking, such decoupling has been relative, except for SO<sub>x</sub> and NO<sub>x</sub> emissions, where decoupling has been absolute. A 2004 law laid the basis for the National Plan for Sustainable Development, which is to be renewed every four years and linked to sectoral plans. A participatory follow-up process (assessment report and indicators) has also been established. The law created an Interdepartmental Commission on sustainable development (CIDD) and a Superior Council for Sustainable Development (CSDD) comprising representatives of civil society. Progress has been made

in integrating environmental concerns into certain sectoral policies such as transportation, with priority given to *public transport* and an increase in the Rail Fund, but efforts have been inadequate in other sectors. With regard to the *taxation of transportation and energy*, the annual vehicle tax is now calculated as a function of CO<sub>2</sub> emissions, and a fuel tax (the "Kyoto cent") has been introduced to combat climate change. A National Plan for Energy Efficiency has been introduced, together with economic incentives targeted at the construction industry, and a national body has been created to provide information and advice on energy savings and renewable energy.

However, decoupling problems persist, especially for *CO<sub>2</sub> emissions*. Trends in the transport and energy sectors are of concern, particularly as the "*motorisation rate*" is among the highest in the OECD, and taking account of sales of fuel to non-residents, Luxembourg's economy is the most carbon-intensive in the OECD in per capita terms. The country's wealth also generates pressures from household consumption and other economic activities. The 1999 National Plan for Sustainable Development, mostly implemented by the Ministry of the Environment, is to be replaced by a new plan for which a draft, approved by the government in 2009, has yet to be adopted. The *gasoline price gap* between Luxembourg and neighbouring countries should be reduced to encourage fuel savings and to reduce the emissions caused by fuel exports (transit, cross-border workers, "gas pump tourists"). These exports in fact account for 75% of fuel sales in Luxembourg. Some tax provisions, such as the commuter head tax, are potentially damaging to the environment. A comprehensive "*green tax reform*" as recommended in the previous review, has not been undertaken. Environmental policies lack a *long-term vision*. The environment is still often seen in some political debates as a constraint on economic development. R&D efforts (the environmental component of the CORE programme), eco-technologies (the new 2009 Action Plan), energy savings (2008 National Energy Efficiency Plan) and the promotion of public transport are all part of a *new conception of the environment as an economic opportunity*. But as Luxembourg looks ahead post-crisis, it is not certain that environmental action will receive greater priority, beyond the country's European commitments.

#### **Recommendations:**

- develop a "*green package*" as part of efforts to sustain economic activity and to emerge from the crisis, with a proactive and *long-term environmental vision*;
- promote *synergies* between the environment and R&D, technology, exports, energy savings and resource productivity in the context of diversifying the national economy;
- adopt and *implement* the National Plan for Sustainable Development; adopt and implement the sectoral master plans;
- identify and eliminate *subsidies* and tax provisions that are potentially damaging to the environment;
- review, revise and increase, when necessary, environmental taxes and charges, in particular on transportation and energy, perhaps in the context of a *broader tax reform*;
- review *subsidies* for energy savings and renewable energy and assess their economic efficiency and environmental effectiveness.

#### ***Integrating environmental and social decisions***

During the period under review, a number of *health indicators* have improved: life expectancy is up, while the child mortality rate is down by half and is now half the OECD average; the dioxin content of maternal milk is lower. Health risk factors, and environmental ones in particular, are regularly checked and the results are often published. Luxembourg has adopted electromagnetic field exposure limits that are stricter than those in the European recommendation are. With regard to *environmental democracy*, Luxembourg ratified the Aarhus Convention in 2005, and its Protocol on Pollutant Release and Transfer Registers in 2006. The recent trend in legislation and case law has facilitated *access to justice* for environmental protection associations. A public mediator has been appointed. The State provides financial

assistance to NGOs dedicated to environmental protection and to local and regional initiatives for implementing the *Action 21* programme, and they have multiplied with this support. New legislative provisions have strengthened the *role of the communes*, inter-communal co-operation, and *partnership with the central government* in nature conservation. The Ministry of the Environment conducts regular environmental awareness campaigns. The University of Luxembourg has a programme for research on environmental technologies and is helping prepare a national strategy for *sustainable development education*.

Although Luxembourg has a high standard of living, some of its health indicators are worrying: for example, the death rate from respiratory diseases is higher than the OECD average. Children are more exposed to *health hazards relating to air pollution*, noise and road accidents than in other EU countries. A "noise map" has been prepared, but no measures have been taken to *combat noise*. There has been little strategic thinking about the links between health and environmental conditions. Greater attention should be paid to the potential economic benefits that would flow from better environmental conditions and a healthier lifestyle. With respect to *environmental information*, there has been little progress in collecting and publishing environmental data, and the country is falling behind in its national and international reporting obligations; people are not always informed about public consultations; inadequate use of environmental indicators hampers environmental governance and planning; the *links between the economy and the environment* have not been studied; there is no regular collection of data on public and private spending on environmental protection nor material flows analysis, part of the OECD Council recommendation on resource productivity.

#### **Recommendations:**

- design and implement a national plan for better *integration of environmental and health policies*;
- improve the production and dissemination of *environmental information* for timely compliance with national obligations and international commitments; seek synergies among the different players;
- analyse the *interactions of environmental policy with the economy* (for example, expenditure data); develop environmental accounting and material flow accounts;
- pursue local initiatives for implementing the *Action 21* programme;
- develop environmental *education*, particularly in secondary and higher education, as part of the new National Plan for Sustainable Development.

### **3. International Co-operation**

Among OECD DAC members, Luxembourg is one of the most generous donors. In 2008, it devoted 0.92% of GNI to *official development assistance*, exceeding the United Nations target of 0.7% and approaching its own objective of 1%. Around 8% of total bilateral aid goes to environmental protection, water supply and sanitation. The government is committed to enlisting public support for efforts to adapt to climate change. *Regional co-operation* with neighbouring countries on nature and water conservation has been boosted within the context of the "Grande Région" and the International Commissions for the Protection of the Moselle and the Sarre. Despite some delays, Luxembourg transposed the main European environmental directives into its domestic legislation during the period under review. Luxembourg's presidency of the European Union, in the first half of 2005, helped win adoption of the guideline to "Encourage the sustainable use of resources and strengthen the synergies between environmental protection and growth" of the Lisbon Strategy. In 2008 Luxembourg adopted a national plan for implementing the Stockholm Convention, detailing measures taken and progress achieved in reducing or eliminating *persistent organic pollutants* (POPs). Real progress has been made concerning trade in hazardous substances (hazardous waste, chemical products, POPs, ozone-depleting substances) and

environmentally responsible business conduct (for example implementation of the OECD Guidelines for Multinational Enterprises).

In 2007, GHG emissions were at their 1990 level, and Luxembourg's action plan will not be enough to achieve the *ambitious target* (-28% below 1990 levels) set under the *Kyoto Protocol* and the EU burden-sharing agreement. CO<sub>2</sub> emissions per capita are the highest in the OECD (although a significant portion comes from international road transport). The sector shares of GHG emissions have changed radically since 1990: *i*) emissions from the steel industry have sharply declined with replacement of blast furnaces by electric arc furnaces; *ii*) *transport emissions* have risen with the growing number of cross-border travellers and higher export sales of diesel and gasoline, reflecting lower prices in Luxembourg vis-à-vis neighbouring countries. Luxembourg will need to rely heavily on *flexible mechanisms* (estimated at about EUR 360 million) to achieve its GHG targets. The country is unlikely to meet its *NO<sub>x</sub> emission* reduction goals (52% below 1990 by 2010) set under the Gothenburg Protocol to the Convention on Long-range Transboundary Air Pollution. Compliance with international commitments is lagging, particularly with respect to the *EU environmental directives*. Luxembourg has been cited on several occasions for infractions of European environmental legislation (urban waste water, nitrates, integrated prevention and reduction of pollution). These lags could be overcome by devoting more resources to meeting international commitments and by giving greater economic and diplomatic priority to the environment.

**Recommendations:**

- continue to strengthen the environmental dimension of *official development assistance* (environmental projects, environmental impact assessments of other projects, climate change adaptation);
- speed up and reinforce implementation of the measures adopted for achieving the Kyoto target; prepare for *post-Kyoto* by integrating climate change objectives into energy, construction and transport policies (for example, energy efficiency, energy charges and taxes, transport charges and taxes);
- expand co-operation mechanisms through the international commissions on transboundary waters (for example, mutual evaluation of management plans and action programmes);
- fulfil obligations and reinforce co-operation regarding *air pollution* in Europe (European directives, Gothenburg and Aarhus protocols); promote and contribute to implementation of a *regional plan for ground-level ozone*;
- implement the National Plan for the *Stockholm Convention*, including for substances recently added;
- promote international environmental co-operation and step up *environmental diplomacy* efforts in Europe and around the world.