

LUXEMBOURG

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CONCLUSIONS AND RECOMMENDATIONS¹

During the 1990s, Luxembourg's economy experienced strong growth (averaging 7% a year), and the resident population rose 1.1% a year. Pressures on the environment from production generally decreased over this period, while pressure from consumption (traffic pollution, waste generation, suburban expansion) increased with rises in population and personal income. Luxembourg is highly interdependent economically and environmentally with neighbouring countries and Europe as a whole, with exports and imports reaching 95% of GDP, 94% of electricity imported, much industrial waste exported, transboundary air and water pollution, and large numbers of foreign vehicles present. One-third of the workforce lives outside Luxembourg.

Luxembourg has set ambitious environmental objectives. During the 1990s, EU directives had a decisive influence on the country's environmental policy. In combination with industrial contraction and restructuring, environmental policy has led to significant progress on conventional pollutants. Diffuse and consumption-linked pollution, deterioration of the natural environment and waste generation are not yet under control. The coming challenges are: i) to implement more cost-effective environmental policies; ii) to integrate environmental concerns more fully into economic decision making; and iii) to continue and to expand international co-operation.

This OECD report establishes a baseline for assessing future environmental progress and examines Luxembourg's environmental performance, i.e. the extent to which its domestic objectives and international commitments are being met, based on environmental effectiveness and economic efficiency criteria. A number of recommendations are put forward that could contribute to strengthening the country's environmental performance.

1. Implementation of Environmental Policies

Strengthening the cost-effectiveness of environmental policies

Environmental policy in Luxembourg rests chiefly on environmental laws and regulations. These set strict standards and are comprehensive. They have been strongly influenced by EU directives on the environment and regulatory approaches in neighbouring countries (e.g. best available technology).

Environmental agencies set emission standards for industrial establishments on a case by case basis. Enforcement should be strengthened and private-sector initiatives to enhance environmental management (e.g. under the EMAS programme) should be further encouraged. Environmental data and indicators need to be better developed and more extensively used in designing, implementing and assessing policy.

Public expenditure on pollution control and nature conservation represents around 0.75% of GDP. This includes current expenditure and investment by national and local authorities. The Environmental Protection Fund and the Water Management Fund support in particular local authority investments in environmental infrastructure at varying rates, covering up to 100% of capital costs. Information on private-sector expenditure is not collected.

Luxembourg has endorsed the polluter pays and user pays principles. In practice, however, polluters usually do not meet the costs they generate, nor do users of environmental services bear their costs. Little use is made of economic instruments to internalise negative externalities. Local authorities set charges for waste disposal and waste water treatment, which are generally low since communes as a rule meet only 10% of infrastructure investment costs. Taxes on motor vehicle fuel are set so as to maximise tax revenue, and over half of all motor fuel is sold to non-residents. This "gasoline tourism" has adverse environmental effects. A government intention to introduce environmental taxes, first broached in 1994, has not yet been acted on.

¹ Conclusions and Recommendations reviewed and approved by the Group on Environmental Performance at its meeting in July 2000.

It is recommended to:

- better respond to the environmental challenges arising from continued growth in consumption, mobility and land use;
- translate medium- and long-term strategic plans into priorities for environmental management and financing;
- apply the polluter pays and user pays principles more fully (e.g. in the management of waste, waste water and energy);
- increase the use of economic instruments for waste and water management at the local level;
- strengthen the enforcement of environmental laws and regulations;
- develop voluntary initiatives in the industrial sector (environmental management, audits, etc.);
- improve environmental information (data, indicators).

Air

Luxembourg has met or will shortly meet all its international commitments to reduce emissions of atmospheric pollutants. Emissions of most conventional pollutants have been decoupled from economic growth, chiefly as a result of the shift to a largely service economy and technological changes in industry. Since 1990, emissions of SO_x, NO_x and CO have fallen by approximately 75%, 25%, and 70%; CO₂ emissions have fallen by approximately 20%. The many regulatory measures that have been applied include improving fuel quality for industrial and household use, ending sales of leaded gasoline, limiting industrial and transport emissions and mandating technical inspection of motor vehicles. Air quality is good in Luxembourg and ambient air standards are generally met, except for ozone.

Since 1994 exceedances of ambient thresholds for tropospheric ozone, in both urban and rural areas, indicate the need to better control regional emissions of NO_x and NMVOCs, in particular from vehicles. In 1999 Luxembourg set particularly ambitious targets to reduce emissions of SO_x, NO_x and VOCs under the Gothenburg Protocol. It will achieve these objectives only if concerns about air quality are more fully integrated into decisions concerning transport, energy, economic policy and taxation. To that end, economic instruments could be used to influence energy consumers' behaviour, and economic analysis could be used to improve selection of policy measures. In particular it would be appropriate to examine the environmental effectiveness and economic efficiency of fiscal instruments such as an environmental surtax on motor vehicle fuels.

It is recommended to:

- define and implement the measures needed to meet commitments on emissions to air (CO₂, NO_x and NMVOCs), including economic instruments;
- continue to develop and promote public transport at regional level, and to internalise the external costs of road transport (e.g. with an environmental surtax on motor vehicle fuels);
- resolutely apply energy-saving programmes, particularly for transport and the residential/commercial sector, with priority on the most cost-effective measures;
- strengthen co-operation between national and communal authorities in enforcing regulations on atmospheric emissions;
- develop and implement a regional plan for the prevention and control of tropospheric ozone (aiming at NO_x, VOCs and ozone), in co-operation with neighbouring countries.

Waste

Luxembourg has a comprehensive set of laws and regulations for waste management based on prevention and recovery. A national waste plan is being prepared. Numerous information and awareness measures are directed at households and the commercial sector. Separate collection, covering all recoverable components, takes place throughout the country. Disposal infrastructure has been modernised and brought into line with standards. Non-compliant facilities, such as landfills for inert waste, hospital incinerators and a national landfill for non-household waste, have been closed. Work has begun on establishing a register of polluted sites and on cleaning up former landfills and other contaminated sites. Technological change in the steel industry (conversion from blast to electric arc furnaces) has helped to reduce quantities of industrial waste, and to transform this industry into one specialising in the recovery of scrap from well beyond the country's borders. Several other industrial sectors (glass, aluminium, construction) also use high proportions of recovered materials.

To meet the quantified targets in the National Plan for Sustainable Development cost-effectively, enforcement of some regulations should be stepped up and economic instruments used more fully. Volumes of municipal waste are increasing under the dual impetus of population growth and rising per capita generation of waste. The polluter pays principle is applied only partially. Over half of Luxembourg's industrial, commercial and service waste is exported. Accordingly, firms should systematically establish waste prevention and management plans, and efforts to find reliable medium- and long-term disposal capacity should be made, including through bilateral or multilateral co-operation with neighbouring regions. Substantial efforts are needed to manage hospital waste more effectively.

It is recommended to:

- finalise and implement the National Waste Management Plan;
- emphasize efforts to reduce volumes of municipal waste (e.g. through implementing of harmonised taxation by all local authorities, application of the polluter pays principle, awareness campaigns on waste prevention, efforts to change consumption patterns);
- assure more efficient utilisation of municipal waste treatment capacity;
- pursue the prevention of industrial, commercial and service waste generation (via waste prevention and management plans, improved dialogue with public authorities, advisory services to promote producer-responsibility, economic instruments, voluntary agreements), and the reuse/recovery of such waste;
- assure on a long term basis the disposal of Luxembourg's final industrial waste through making increased use of national disposal capacities and through concluding agreements with neighbouring countries;
- manage hospital waste effectively, respecting the proximity principle;
- speed up the establishment of a register of polluted sites and the clean-up of contaminated sites.

Nature

In response to pressures on the natural environment from development (agriculture, urbanisation, transport infrastructure, tourism), Luxembourg has introduced laws and regulations to protect nature and has built up a satisfactory, well organised body of information of species, including inventories of fauna and flora, and red lists. Significant public expenditure, on the order of 0.12% of GDP, is allocated to nature conservation, including backing for the activities of several NGOs. The National Plan for Sustainable Development contains a strategic vision and a set of objectives concerning biodiversity, forests, agriculture, soil and watercourses. Luxembourg has ratified all international conventions on nature conservation. In the "green belt" (i.e. all land not covered by physical development plans), building is allowed only for farming or public purposes. A ban on forest clearance has played a major role in protecting woodland habitats. Forest policy has reverted to a more sustainable approach, involving acknowledgement of the economic, environmental and social functions of woodlands, natural regeneration of deciduous areas and a shift from conifer plantations to deciduous or mixed planting. Purchases of woodland by the public authorities have expanded the area of forest in public ownership by 37% over the past ten years.

However, nearly 20 years after passage of the 1982 Conservation of Nature and Natural Resources Act, despite ambitious statements of intent, just 1% of the national territory is classified as conservation areas (24 reserves have been established, out of a projected 140) and 6.2% as special protection areas (15 SPAs, under the EU birds directive). The Upper Sure natural park was completed in 1999 but two other projects, including the Our park proposed in the 1964 Clervaux Treaty with Germany, have yet to be implemented in practice. The management of these areas is inadequate, with a lack of multi-year management plans and qualified staff. The conservation areas, at present highly fragmented, are to be extended (under the habitats directive) and included in a national ecological network as part of the EU's Natura 2000 system. The modernisation of agriculture has greatly contributed to the depletion of biodiversity in Luxembourg. The agri-environmental programme (providing assistance for shifts to extensive stockbreeding and arable farming, support for organic farming, introduction of structures for landscape protection, etc.) is not sufficiently utilised and ought to be strengthened. A policy to conserve the agricultural environment, integrating the restoration of natural habitats in farm management, would be desirable. Sustainable management of private forest (54% of the total) is difficult because much of the land is in small plots.

It is recommended to:

- use information on species and their habitats more effectively to define priorities for nature conservation and build public awareness of these priorities;
- increase the extent of protected areas by activating the Luxembourg component of the Natura 2000 network, and by realising the Germany-Luxembourg and France-Germany-Luxembourg natural parks, in co-operation with these neighbouring countries;
- strengthen protection of conservation areas by establishing and applying multi-year management plans for existing SPAs and for special conservation areas;
- boost the resources for nature conservation and promote partnerships among central and local government and social partners;
- control water pollution and continue rehabilitation of aquatic ecosystems;
- continue efforts towards sustainable forestry;
- significantly step up agri-environmental efforts as well as measures to promote sustainable physical development (partnerships, intercommunal syndicates, integration of nature conservation concerns in agriculture policy, progress towards sustainable farming and tourism practices).

2. **Towards Sustainable Development**

Integrating environmental issues in economic decision making

Despite rapid growth of GDP and the population, several pressures on the environment have diminished significantly in Luxembourg. This decoupling is chiefly the outcome of a shift to a largely service economy, with rapid expansion in the tertiary sector replacing the former dominance of steelmaking. But the striking economic performance, and the greater household affluence that it brings, are generating challenges for the protection of the environment and nature. The construction sector is expanding swiftly, the car ownership rate is Europe's highest and environmental policies have to cope with the consequences of changing consumption patterns entailing greater volumes of waste, more traffic, spreading suburbs and the related demand for environmental infrastructure.

With few exceptions, environmental concerns are not yet fully integrated into sectoral policies. In agriculture policy, EU initiatives to promote more environment-friendly farming should be followed up more diligently. In energy, transport and fiscal policy, environmental concerns seem to carry little weight. Overall, Luxembourg primarily emphasises economic and social development, protection of agriculture, development of road transport and growth in household consumption.

The ambitious National Plan for Sustainable Development covers the economic, environmental and social dimensions of sustainability. It lists current realities and operations and sets them against scenarios for the future; it identifies priorities for action; it covers all major economic sectors and all relevant environmental management issues. Drawn up by the Ministry of the Environment, with the backing of an interministerial working group, it was approved by the government in 1999 for consultation. Parliamentary debate as well as broad consultation of the population are to take place on this document during 2000. This process should lead to clarification of objectives and deadlines, and encourage local Agenda 21 initiatives. It should also be co-ordinated more closely with the process of physical development planning.

Environmental impact assessments (EIAs) could be strengthened in terms of both projects and policies. Mechanisms for public consultations and dispute mediation should be expanded.

It is recommended to:

- further specify the National Plan for Sustainable Development with quantified objectives and deadlines, following broad consultation with government agencies and social partners;
- institutionalise a high-level body for interministerial co-ordination on sustainable development;
- translate the National Plan for Sustainable Development into practical measures for fuller integration of environmental concerns in sectoral policies, particularly agriculture and transport policy;
- consider the introduction of environmental taxes and charges, possibly in the context of broader fiscal reform;
- strengthen EIAs in terms of both coverage and policy;
- develop partnership approaches for local environmental management (e.g. local Agenda 21 initiatives).

Energy and the environment

During the 1990s, final energy consumption in industry fell by 30% thanks to the contraction of steelmaking, enhanced energy efficiency (estimated at 13%) and structural and technological change. A key factor is that, largely because of the replacement of blast furnaces by electric arc processes, energy consumption in the steel industry has fallen substantially in recent years. Since 1990, the use of solid fuels has fallen by 60%, while the use of natural gas has risen by 50%. Natural gas is increasingly used by industry and households, and the trend will continue when a new gas turbine/steam co-generation plant is commissioned in 2001. Use of renewable energy sources is progressing, despite their limited potential. The Energy Efficiency Act (1993) seeks to promote energy saving in all sectors and to reduce dependence on conventional energy forms by encouraging the use of renewables. A national strategy to reduce greenhouse gases was developed in May 2000. Voluntary agreements have been used effectively to encourage greater energy efficiency in a number of industrial sectors.

In the 1990s Luxembourg's energy intensity fell by 33%, but it is still 9% above the average for OECD Europe. In the late 1990s, CO₂ emissions per unit of GDP were 20% above the OECD Europe average, even though 94% of the electricity consumed in Luxembourg is imported. The level of excess emissions would not be substantially different if emissions from vehicle fuels sold in Luxembourg but consumed abroad were deducted, and emissions arising abroad from the generation of electricity consumed in Luxembourg were added. Energy consumption by transport, largely accounted for by road vehicles, has risen 54% since 1990. Taxes on vehicle fuel, lower than in neighbouring countries, attract substantial purchases by non-residents (50-70% of fuel sales). Similarly, energy consumption in the residential/commercial sector has risen 40% since 1990. Subsidies have been the main tools used to encourage better energy efficiency and use of alternative energy sources, but with little take-up by industry. The incentive effects of the few economic instruments employed in recent years have been small. To achieve the targets in the National Plan for Sustainable Development, Luxembourg will have to consider additional measures, particularly to reduce energy intensity. Allocation of subsidies for renewables should be associated with stringent economic analysis.

It is recommended to:

- specify the energy-related objectives and measures in the National Plan for Sustainable Development, involving all parties concerned;
- strengthen incentives for energy efficiency, particularly in the transport and residential/commercial sectors;
- seek to progressively increase the price of motor vehicle fuels so as to encourage savings in motor fuel consumption, reduce emissions and achieve fuller internalisation of external costs;
- make use of economic analysis to support the choice of subsidies for renewable energy development;
- establish an effective follow-up and evaluation system for energy efficiency incentives;
- conduct a more systematic assessment of the environmental impacts of the use of the main energy sources.

3. International Co-operation

Luxembourg has successfully helped deepen bilateral and regional co-operation on environmental matters. It has rapidly implemented most EU directives and ratified most major international environmental agreements. Luxembourg's environmental standards are frequently high, and striking achievements such as recovering CFCs from discarded refrigerators deserve mention. River water quality has improved and transboundary water pollution has diminished. With regard to atmospheric pollutants, international targets for SO_x have been more than met. Targets for NO_x and VOCs have been reached or will be soon. On CO₂ emissions, the very ambitious targets that Luxembourg has set itself for 2000 and 2005 will probably be met. To reach the target of reducing emissions by 2008-12 by 28% over 1990 levels, as laid out in an EU agreement, current measures will need to be stepped up. Luxembourg is among the most generous providers of official development assistance, and the level of aid has increased considerably in recent years.

While the achievements in international co-operation are wholly positive, there remain areas to which insufficient resources have been devoted or where political will has been somewhat lacking. Several EU directives have not yet been fully implemented. Strategies and plans of real effectiveness are lacking in many spheres, particularly for waste, chemicals, atmospheric pollutants and CO₂. Investment in tertiary wastewater treatment plants has not been on schedule. Transboundary river pollution and the resulting soil pollution have not diminished as much as had been hoped. Substantial efforts will be necessary to meet the Gothenburg Protocol targets.

There is little or no follow-up on legislative measures taken with a view to promoting international co-operation. Application of the concept of sustainable development has made little headway at either interministerial or local level. Ratification of some conventions has been considerably delayed. In many cases these delays have been due not only to insufficient resources to meet international commitments, but also to the low priority ascribed to the environment.

It is recommended to:

- pursue and step up regional co-operation on the environment (e.g. on waste, tropospheric ozone, natural parks and protected zones);
- take all institutional and financial measures needed to establish and fund the tertiary waste water treatment facilities required under the EU waste water directive;
- adopt and implement strategies and plans to meet the international obligations stemming from the Kyoto and Gothenburg protocols by 2010, and strengthen the measures already in place.

