

## CONCLUSIONS AND RECOMMENDATIONS\*

In the 1990s, Norway's GDP grew by 35%; its GDP per capita increased by 28%, to rank third among OECD countries. Much of Norway's economy depends on the use of its natural resource base. Its economic performance to a large extent reflects the rapid growth of the Norwegian oil and gas industry. Extensive hydroelectricity resources supply a range of energy intensive industries, and per capita electricity consumption is the world's highest. Fisheries and aquaculture registered increases in production of 60% and 120% over the 1990s.

Awareness of national and international environmental issues has long been high in Norway, which is exposed to air and coastal water pollution influenced by emissions from other countries. Other pressures on its environment are associated with offshore oil and gas production, fishing, transport, and growing demand for electricity. Norway faces the challenge of optimising the economic benefits of its rich natural resource base while protecting its environmental and social values. Priority environmental issues are presently: biodiversity, eutrophication and oil pollution, waste and recycling, climate change, outdoor recreation, cultural heritage, hazardous chemicals, international co-operation, and environmental protection in polar areas.

It is necessary for Norway to: i) increase the effectiveness of its environmental policies; ii) ensure that it obtains full results from its improved integration of environmental concerns into economic and social decisions; and iii) reinforce its international environmental co-operation. This report examines progress made by Norway since the previous OECD environmental performance review in 1993, and evaluates the extent to which Norway's domestic objectives and international commitments are being met. A number of recommendations are put forward that could contribute to strengthening the country's environmental performance.

### 1. Environmental Management

#### *Increasing the effectiveness of environmental policies*

In the 1990s, Norway strengthened its environmental regulatory framework with new waste management and nature conservation measures, and with the transposition of EU directives as a result of the 1992 Porto Agreement on the European Economic Area. There has been decentralisation of responsibility for environmental management towards the municipalities, particularly with respect to nature conservation and land-use planning. Use of economic instruments has evolved; highlights have included introduction of the CO<sub>2</sub> tax in 1991 and extension of its coverage in the late 1990s, taxes on final disposal of waste, recycling deposits on electrical and electronic products, and taxes on environment- and health-damaging chemicals. Environmental Impact Assessment regulations have been revised, with greater coverage of projects. Land-use planning has been an important instrument to better protect environmentally and culturally valuable areas, and to support transport management. The pilot Green

---

\* Conclusions and Recommendations reviewed and approved by the Working Party on Environmental Performance at its meeting in July 2001.

Government Project focuses on green procurement, energy savings and waste management in ten government agencies.

The fact that Norway's environmental actions have continued to be based mainly on ambient quality criteria and cost-effectiveness has avoided use of funds to realise small environmental benefits at the domestic level. However, this approach is not necessarily consistent with policies based on emission standards, such as some of those adopted within the EU, or with emission reduction targets such as those in multilateral environmental agreements. Despite several achievements in the 1990s (e.g. reduction of SO<sub>x</sub> and lead emissions), Norway's performance has been insufficient to meet a number of its own environmental objectives (e.g. concerning NO<sub>x</sub> and VOC emissions, nutrient discharges, waste generation, nature protection). Environmental pressures from fast-growing sectors (energy production, fisheries, aquaculture, transport) have increased. Despite this gap between intentions and results, good intentions remain, with much conceptual work carried out to broaden and strengthen use of economic instruments (e.g. transferable quotas for air emissions, green taxation) and renewed inter-ministerial commitments regarding a number of environmental objectives. The challenge ahead will be for Norway to show that it can meet its domestic and international environmental commitments, even those which are not critical for its own environment.

It is recommended to:

- improve the effectiveness of environmental policies with respect to a number of priority environmental objectives adopted nationally or internationally;
- adhere to and continue to pursue established long-term environmental objectives while closing the implementation gap;
- strengthen implementation of environmental policies and legislation, with appropriate supervision of enforcement for both pollution abatement and nature protection;
- continue to extend use of economic instruments for environmental management, on the basis of the conceptual work carried out in the 1990s (e.g. tradeable permits, green taxation); consider mechanisms to achieve better results concerning emissions of NO<sub>x</sub> and VOCs and nutrient discharges;
- assess further the economic rationale of exempting some emitters from paying the full rate of the CO<sub>2</sub> tax, taking into account the environmental and social implications of these rate differences;
- continue to provide environmental information and economic analysis to support environmental policy developments, including energy prices and environmental expenditure.

### ***Water***

In the 1990s, Norway made considerable investments in waste water treatment and reduction of nutrient discharges to fresh and coastal waters, partly following international commitments (EU Urban Waste Water Directive, North Sea Conference targets). The proportion of the population connected to municipal waste water treatment increased from 59% in 1990 to 80% in 1999, and progress with respect to tertiary treatment has resulted in lower nutrient discharges. Use of commercial phosphate fertilisers in agriculture has been halved since 1980; pesticide use has also been cut significantly. Overall phosphorus inputs to the North Sea have nearly been halved (the North Sea Conference phosphorus reduction target). Oil discharges from refineries decreased 92% in the 1990s, reflecting the closure of one refinery and improved effluent treatment at others. Acidity levels have improved in lakes and watercourses in southern Norway.

An abundance of water resources has resulted in water quality management being given relatively low priority on Norway's environmental agenda. Water quality is not satisfactory in a number of bays/fjords, particularly near Oslo and at industrial or aquaculture sites, and further investment in waste water treatment will be necessary. Eutrophication remains a challenge. Nutrient run-off from agriculture has not been effectively reduced. The North Sea Conference reduction target for nitrogen discharges was not achieved. Further efforts are needed to reduce discharges of oil and other substances from offshore oil and gas operations. Supply of drinking water is not fully satisfactory. Water pricing could provide more accurate signals concerning actual costs of water services (user-pays and polluter-pays principles).

It is recommended to:

- reduce eutrophication by decreasing nitrogen discharges, particularly from households, agriculture and aquaculture; in particular, strengthen efforts to achieve the North Sea Conference targets;
- continue efforts to reduce discharges of oil and other substances from offshore oil and gas operations;
- continue to invest in municipal waste water treatment;
- continue to reduce the share of the water supply which is of unsatisfactory quality;
- introduce pricing of water used in agriculture and industry; install metering for new consumers and progressively introduce it for other consumers.

## ***Waste***

There were important developments regarding waste legislation in Norway during the 1990s. A comprehensive framework now exists for environmentally sound and economically efficient waste minimisation and waste management. With reference to EU waste legislation, Norway has codified all the basic principles (e.g. the precautionary principle, the self-sufficiency principle, the polluter-pays principle and extended producer responsibility) of modern waste management approaches with respect to both infrastructure and practice. Implementation of legislation has occurred rapidly, and numerous collection/return schemes have been introduced for recoverable waste streams (e.g. oil, tyres, end-of-life vehicles, packaging, electrical and electronic scrap). Material and energy recovery of waste increased from around 20% in 1990 to some 48% in 1998; the target for 2010 is 75%. Due to intensified recovery activities, the annual percentage of waste going to landfill has been decreasing. However, the volume of waste generated has been increasing. Management of final disposal has improved: emissions from incineration were cut significantly during the 1990s, and methane recovery from landfills increased (with 18% of municipal landfills having installed gas recovery systems).

Waste generation has increased in proportion to GDP growth. This trend is projected to continue until 2010, although Norway has established a general target of "reducing the growth rate of waste generation considerably below the rate of economic growth". Decoupling waste generation from economic growth is Norway's main waste policy challenge. Methane emissions from landfills were 182 000 tonnes in 1990 and 190 000 tonnes in 1998, but increased waste generation (and consequent landfilling) is outstripping the positive effects of improved methane recovery. Further remediation is needed for closed landfills and other contaminated sites. Environmentally sound management of hazardous waste has been a national objective since the early 1990s. Nonetheless, around 20 000 tonnes was still disposed in an unknown way in 1998. A 7% increase in hazardous waste generation between 1996 and 2010 is projected. Meeting the hazardous waste management challenge will require infrastructure improvements.

It is recommended to:

- intensify efforts to decouple waste generation from economic growth;
- enhance implementation of extended producer responsibility schemes in various industrial sectors;
- conduct cost-benefit analysis of material recovery schemes and assess their environmental benefits compared to other forms of waste recovery and disposal;
- elaborate plans to ensure that treatment and disposal of hazardous waste are organised in an environmentally sound and economically efficient manner, and clearly identify infrastructure needs;
- continue efforts aimed at remediating closed landfills and other contaminated sites.

### *Nature and biodiversity*

In response to growing pressures on and concern about nature and biodiversity, Norway strengthened its institutional framework for biodiversity management in the 1990s through: legislation (1995, amended Nature Conservation Act; 1993, amended Wildlife Act; 1992, Act on Salmonids and Freshwater Fish; 1999, Fish Disease Act; 1999, Aquaculture Act; 2000, Water Resources Act), national plans and programmes establishing objectives and targets (e.g. protected areas and coniferous forest conservation), and the newly created Inspectorate for Nature Management. Policy integration of biodiversity conservation into sectors such as agriculture, forestry and fisheries has been pursued. For instance, forestry strategies reflecting environmental considerations have been adopted in a majority of counties. Certification of forest management practices now applies to some 70% of the timber traded in Norway. Greater involvement of local governments in managing protected areas should also lead to more effective nature conservation. Norway has ratified most relevant international agreements on nature conservation. It adopted the 1997 national biodiversity strategy and overhauled its biodiversity monitoring capacities. In 2001, a White Paper on Biodiversity, which is to serve as a national biodiversity action plan, was submitted to the Parliament.

However, protected areas cover only 7.6% of mainland Norway, far below the National Park Plan target of 13%, which has been postponed to 2010. Protected areas in the present system lack representativeness, with forest and marine ecosystems particularly under-represented. Habitats suffer from fragmentation due to construction of forest roads. Stocks of several important marine fish species in Norwegian waters (e.g. cod, haddock, Greenland halibut) are below sustainable levels. Norway was not able to stabilise or reverse the declining trend of wild Atlantic salmon stocks and their biodiversity in its national watercourses during the 1990s, despite measures such as the protection of some watercourses from hydroelectric development, or steps taken to preserve their genetic biodiversity. Protection measures have been strengthened for large predators (bears, wolves, wolverines and lynxes) by designating core protection areas, but the populations of these species are still in a precarious state and conflicts with livestock farming are more heated than ever.

It is recommended to:

- reinforce and accelerate efforts to extend the area and representativeness of protected areas in mainland Norway, meet adopted targets (e.g. doubling protected areas between 1994 and 2010, creating more nature reserves in forested areas), and link to the Natura 2000 network; complete and implement plans for marine protected areas;
- continue efforts to maintain or restore populations of threatened species (e.g. large predators); strengthen efforts to protect wild salmon stocks and their genetic biodiversity;

- continue efforts to integrate fisheries management policy with environmental policies, including managing fisheries on a sustainable and multi-species basis;
- increase support to local authorities to enable them to face their increased responsibilities in nature and biodiversity management.

## 2. Towards Sustainable Development

### *Integrating environmental concerns in economic and sectoral policies*

In the 1990s, Norway experienced high economic growth (+35%), benefiting in particular from increasing revenues from oil and gas operations. Strong decoupling has been experienced for SO<sub>x</sub> and lead emissions and the use of pesticides and ozone-depleting substances. The goal of sustainable management of non-renewable energy sources led to the establishment, in 1991, of a Petroleum Fund as a way to transmit wealth to future generations and buffer the Norwegian economy from excessive fluctuations in petroleum revenues. In the area of institutional integration, economic modelling and analysis have been applied to several environmental issues. Environmental concerns are addressed during the annual budget process, and sectoral environmental plans, targets and reporting mechanisms have been adopted. Concerning market-based integration, Norway has made early and broad use of economic instruments for environmental integration, and has explored in-depth the possibility of introducing a tradeable quota system to manage its greenhouse gas emissions. Environmental management and audit schemes are progressing in Norwegian industry.

Despite these quite advanced and sometimes exemplary policies, overall Norway has achieved only weak decoupling: a number of pollution trends (CO<sub>2</sub>, NO<sub>x</sub> and VOC emissions; nitrate in effluents; municipal waste generation) are still increasing in absolute terms, although more slowly than GDP. Sectoral subsidies (e.g. 69% of production value in the case of agriculture) and quota systems (e.g. fisheries) should be reviewed systematically for their environmental implications. The many exemptions from environmentally related taxes should be reassessed with respect to their economic, social and environmental rationale. The recent shift in taxation away from car use towards car ownership cannot be considered environmentally beneficial.

It is recommended to:

- take further action to more effectively decouple environmental pressures from economic growth;
- monitor progress in sectoral environmental integration and ensure that the targets set in sectoral environmental action plans (e.g. for energy, transport, agriculture, aquaculture, fisheries) are met;
- ensure long-term reliability of fiscal policy measures concerning sustainable management of renewable and non-renewable natural resources, as well as the transmission of wealth to future generations (e.g. through the Petroleum Fund, taxation);
- review and adjust sectoral subsidies with negative environmental implications, in order to achieve greater economic efficiency and environmental effectiveness;
- prepare a national sustainable development strategy.

### *Integrating social concerns into environmental policies*

The distributive effects of environmentally related policy measures are frequently analysed with respect to both intergenerational and interregional equity. This reflects concerns about management of oil and gas revenues and about population distribution over the national territory. The Petroleum Fund, which

has reached an amount equivalent to 30% of GDP, is an important means of transferring assets to future generations. There is extensive public right of access to nature (e.g. fishing, hunting, berry picking), and environmentally sensitive outdoor recreation is well supported. Children below the age of 16 have free fishing rights, even on private property. Norway's strong tradition of local and environmental democracy encourages co-operation, stakeholder participation and gender balance. Environmental NGOs, which co-operate on many projects, have standing and appeal rights in environmental court cases. Local Agenda 21 initiatives have recently gained momentum in many communities. Authorities provide high-quality and frequent environmental information, in-depth analysis and environmental indicators. Environment is a component of all types and levels of education; educational projects are linked to environmental fieldwork.

Despite this generally positive picture, some developments raise environmental and social concerns. Unsustainable use of renewable natural resources (e.g. fishing, reindeer grazing) threaten the integrity of important ecosystems, as well as the economic and social viability of certain areas and communities (fishing communities, indigenous populations, remote rural areas). Use of fiscal instruments for environmental management is being challenged as unfair, on the grounds that too much emphasis is put on their revenue-raising function and not enough on their incentive function. Mediation mechanisms are needed to solve local conflicts (e.g. concerning large predators, overgrazing by reindeer), whereas the prevailing approach is still to solve potential conflicts through sector protection and compensation, thus avoiding or postponing adjustments. A number of legal adjustments are needed to accompany ratification of the Aarhus Convention, particularly with respect to access to information and participation. NGO standing has recently been limited by reducing options for appealing court decisions.

It is recommended to:

- continue efforts to maintain and enlarge the national asset base, and to ensure fair and sustainable transmission of wealth to future generations;
- continue to give consideration to the distributive implications of using economic instruments (e.g. green taxes, allocation of permits);
- seek societal consensus on managing natural resources (e.g. in fishing, forestry, farming) and biodiversity (e.g. with respect to large predators, reindeer herding), giving attention to the concerns of indigenous populations and remote communities;
- ratify and implement the Aarhus Convention; introduce the necessary changes to Norwegian legislation concerning access to environmental information, access to courts and participation;
- continue to promote Local Agenda 21 initiatives and encourage environmentally related co-operation among local communities.

### ***Sectoral integration: energy***

Throughout the 1990s, oil and gas extraction was Norway's most important industry measured in terms of value added (10 to 15% of GDP every year since 1991) and export revenue (32 to 37% of total export value). Norway has made considerable efforts to limit the negative environmental impacts of energy production and use, applying cost-effectiveness as a primary criterion for evaluating policy options, and protecting some 20% of the country's hydroelectric capacity from development. Measures to reduce SO<sub>x</sub> emissions have been highly effective, reducing emissions from mobile sources by 58% and those from industrial combustion by 31% during the 1990s. Emissions of NO<sub>x</sub>, VOCs and CO from mobile sources have also declined significantly, reflecting the fleet's improved average emissions performance (largely due to successful vehicle scrapping programmes and tougher fuel and emissions standards). Norway was

one of the first OECD countries to apply a tax on CO<sub>2</sub>, helping limit growth in CO<sub>2</sub> emissions in some sectors. It has made relatively widespread use of economic instruments to integrate environmental objectives in the energy sector. Analysis and discussion of a national system of tradeable GHG emission permits are at an advanced stage. EIAs are consistently carried out for major energy developments. Energy labelling of a range of consumer products has been implemented.

Norway has not set clear medium- and long-term environmental objectives for the energy sector, particularly regarding energy efficiency and GHG emissions. There are no quantitative targets for improving energy efficiency. Efforts to promote energy conservation and the uptake of more energy-efficient technologies were limited and poorly co-ordinated in the 1990s, but may improve with the establishment of the new Energy Efficiency Agency (ENOVA) in 2001. CO<sub>2</sub> emissions from energy use and production, comprising about 75% of total CO<sub>2</sub> emissions, increased by nearly 19% in the 1990s. Mainly for this reason, Norway has failed to meet two preliminary national targets for CO<sub>2</sub> emission reductions. Over 90% of NO<sub>x</sub> emissions originate from energy extraction and use; the growth of these emissions in the 1990s contributed to Norway's failure to meet related international commitments. VOC emissions from oil and gas extraction increased by 54% between 1990 and 1998; efforts to control these emissions through a voluntary agreement with producers failed. Electricity consumption increased by 13% in the 1990s, with residential and commercial demand accounting for the bulk of the increase.

It is recommended to:

- set clear medium- and long-term environmental objectives for the energy sector and define mechanisms for their integration in energy planning;
- set quantitative objectives for the new Energy Efficiency Agency (ENOVA) and reinforce measures to encourage energy efficiency, especially in the residential sector, industry and transport;
- take measures to moderate demand for electricity (e.g. review electricity prices, ensure their transparency, etc.);
- implement firm and cost-effective measures to reduce NO<sub>x</sub>, VOC and GHG emissions, particularly from oil and gas extraction, road transport and ships;
- take account of ancillary benefits (e.g. reduced emissions of pollutants other than GHG) in assessing measures to help achieve the Kyoto target.

### 3. International Commitments

In the 1990s, Norway continued to give high priority to international environmental co-operation, implementing bilateral and regional activities with its neighbours (e.g. co-operation with Russia, the Action Plan to Eliminate Pollution of the Arctic) as well as with developing countries. Norway is still one of the world's most generous donors of official development aid (0.9% of GNP per year). It actively seeks to promote sustainable development by "mainstreaming" environmental aid into all development aid and by prioritising institutional strengthening. Norway has met all its international commitments to reduce SO<sub>x</sub> emissions. It was also one of the first countries to ratify the Aarhus Protocols concerning POPs and heavy metals, and played an important role in developing the UNEP Convention on POPs. Although data are still incomplete, early indications suggest that Norway has already made considerable progress in achieving its commitments to reduce emissions of certain POPs. Between 1985 and 1995, Norway reduced phosphorous inputs to sensitive North Sea ecosystems by 48%. It has taken early and effective measures to control and reduce the manufacture, trade and use of ozone-depleting substances. Norway has played an active role in international efforts to conserve biological diversity. It actively supported the establishment of the Cartagena Protocol on Biosafety, and was the first country to ratify it.

Despite these achievements, Norway's performance regarding international environmental co-operation has been insufficient in some respects. Concerning climate change, its GHG emissions are projected to increase by 22-26% from 1990 to 2010. Plans have been under development concerning how to meet Norway's Kyoto commitment, based on two White Papers presented to the Parliament (the latest in June 2001) and a 1999 report by a special commission on a national system of tradeable GHG emission quotas. Concerning air pollution, efforts to meet international commitments to reduce NO<sub>x</sub> and VOC emissions have stalled in the face of the rapid growth of energy production and use. With respect to the marine environment, the next decades will be very challenging, with the dismantling of aging offshore platforms as well as the scrapping of increasing numbers of vessels from Norway's very large fleet. Ship scrapping is associated with environmental and safety problems in the developing countries where it takes place. Frequency of inspection of foreign vessels in Norwegian ports decreased significantly in the 1990s, no longer meeting the requirements of the Paris Memorandum of Understanding on Port State Control. Like other members of the North Sea Conference, Norway did not achieve the agreed 50% reduction of nitrogen inputs to the North Sea between 1985 and 1995. For most pollutants, the emissions intensity of offshore operations increased in the 1990s (although Norwegian operations remain relatively clean compared to those of other OSPAR countries). Concerning fisheries, key North Sea stocks jointly managed by Norway are still in peril. Re-examination of the international quota-setting process is clearly indicated. Norway therefore faces major and increasing environmental challenges in the areas of climate change, traditional air pollution, the marine environment and marine resources, all relating for the most part to its energy and fisheries sectors.

It is recommended to:

- set national commitments for reducing greenhouse gas emissions, and develop and implement reduction measures accordingly, independent of the status of the Kyoto Protocol;
- elaborate, and implement with resolve, cost-effective measures to reduce national NO<sub>x</sub> and VOC emissions (e.g. from offshore platforms, ships, gas-fired power plants and private vehicles), and ratify the Gothenburg Protocol;
- take further measures to reduce fishing fleet capacity;
- work towards the establishment and implementation of an international system of fisheries management in the North and Barents Seas, which is based on an ecosystem approach and includes precautionary management strategies for specific stocks;
- ensure that dismantling of offshore platforms is carried out in conformity with relevant OSPAR regulations.