

SWEDEN

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CONCLUSIONS AND RECOMMENDATIONS*

In the 1970s and 1980s, environmental issues were at the forefront of Sweden's agenda despite the country's relatively low population density and the moderate economic growth of the period. In addition to the national dimension, environmental issues in Sweden have a strong international aspect. This is due to regional economic and environmental interdependencies (Nordic co-operation, transfrontier air pollution, North Sea and Baltic Sea pollution). Sweden took the initiative for the first UN Conference on the Environment in Stockholm in 1972 with the aims of identifying the most urgent environmental problems and obtaining agreement on actions to deal with them. In the latter part of the 1980s, Sweden also became strongly involved in global environmental issues (climate change, ozone layer, environmental aid).

More recently, an economic recession and entry into the European Union have provided the context for economic and environmental decision making in Sweden. The overall objectives of Sweden's environmental policy are to: protect human health, conserve biological diversity, manage natural resources so as to ensure their sustainable use, and protect natural and cultural landscapes. Environmental policies today focus on the following themes: climate change, ozone layer depletion, acidification and ground-level ozone, urban environmental quality, eutrophication, metals and persistent organic compounds, management of land and water resources, protection of nature, ecocycle and waste management, chemical safety and nuclear safety.

The challenge of implementation of these policies lies in:

- achieving, in the most cost-effective way, the ambitious targets Sweden has set for itself;
- strengthening the integration of environmental concerns in sectoral and economic decision making;
- continuing to foster effective international co-operation.

This OECD report sets out the baseline for assessing future environmental progress, and it examines the environmental performance of Sweden: the extent to which government domestic objectives and international commitments are being met. A number of recommendations are put forward that could contribute to further environmental progress in Sweden.

1. Implementing Environmental Policies

In the past 25 years, Sweden has developed effective and often very innovative environmental policies. Major achievements have included: developing appropriate legal and administrative instruments; introducing a wide range of economic instruments; broadening the scope of physical planning to include environmental protection and sustainable management of natural resources; extending to environmental matters the principles of Swedish democratic functioning, notably abundant and accessible information, separation of powers, extended role of NGOs and special roles for women and youth; decentralising the implementation of environmental policies; and basing policies on high-quality monitoring and environmental research and development. Sweden has developed strategies founded on precise quantified objectives and periodic follow-up on environmental performance. Its Parliament, the Riksdag, closely monitors the various measures taken and provides policy orientation.

Over the last ten years, economic instruments have been used to supplement the case-by-case regulatory approach to licensing of polluting installations. They have also been used to support the financing of environmental protection. Overall, pollution abatement and control expenditure in Sweden amounts to 1.1 per cent of GDP. So far the implementation of environmental policies has created no substantial problems for the Swedish economy at the macro level. Most of the costs of environmental protection are met by polluters and by users of environmental services. Sweden is implementing the polluter pays and user pays principles strictly. There is little subsidisation to enhance pollution prevention. Municipalities charge citizens the cost of the services they receive to protect the environment.

Nevertheless, there is a need in Sweden to further strengthen the cost-effectiveness of environmental policies while addressing a number of remaining problems, such as ensuring that environmental regulations stemming from the case-by-case approach are harmonised with EU laws based on quality or emission standards, harmonising the integrated pollution control system (applied to emissions into water and air) with industrial waste management,

* Conclusions and Recommendations approved by the Group on Environmental Performance at its May 1996 meeting.

and ensuring a complementary use of regulations, economic instruments and other instruments (voluntary agreements, physical planning, environmental impact assessment, environmental information).

Air

Prompted by serious acidification problems, Sweden has made strong efforts to reduce its own SO_x emissions, and has achieved significant results: an 80 per cent reduction between 1980 and 1993 and a level of SO_x emissions per unit of GDP that is among the lowest for OECD countries. NO_x and VOC emissions are also decreasing. Substantial progress has been made in reducing emissions of hazardous air pollutants, including ozone-depleting substances, heavy metals and organic substances. CO₂ emissions have decreased by 40 per cent since 1970 and are now among the lowest for OECD countries. Swedish cities do not experience very serious local pollution, though there are some significant problems in larger cities with NO₂ and particulates. Ground-level ozone concentrations exceed World Health Organisation levels in many places in southern Sweden.

A range of measures has contributed to these remarkable achievements. Regulations on fuel quality and a case-by-case licensing system for stationary sources have formed the basis of air pollution control; continual efforts have been made to strengthen licence conditions through monitoring of available technology. Vehicle emission standards that in practice require the use of three-way catalytic converters on cars have been in effect since 1989. Energy policy promoting a shift from oil to electricity and biofuels, as well as higher energy efficiency along with an expansion of the use of district heating, contributed to the decrease of atmospheric emissions. Several economic instruments were introduced recently; they include a CO₂ tax, a sulphur tax on fuel, a NO_x charge/refund system for larger power/heat plants, an emission charge on domestic aircraft and environmental classification of fuels and vehicles, with differentiated taxation.

Although national emissions have largely decreased, deposition of acidifying substances in Sweden has not lessened accordingly. It is estimated that a large reduction of SO_x, NO_x and volatile organic pollutants in Europe will be necessary to reduce deposition below critical loads in Sweden, in the context of wider air pollution concerns including pollution from VOCs and ground-level ozone. Additional domestic efforts are required to meet national targets for NO_x and VOC reductions; increasing vehicle traffic is cause for concern about future NO_x and CO₂ emissions. Sweden is using carbon taxes, as well as other, multiple-purpose policies and measures, to limit CO₂ emissions. Existing measures are not expected to fully stabilise CO₂ emissions at 1990 levels by 2000. Beyond 2000, CO₂ emissions are likely to increase, even if Sweden retains nuclear plants. In summary, Sweden needs to strengthen further its air quality management and its integration of environmental concerns in sectoral policies, especially transport and energy policies.

It is therefore recommended that consideration be given to the following proposals:

- promote work to control NO_x and VOC emissions from non-road equipment and ships;
- promote stricter requirements for NO_x, VOC and particulate emissions from vehicles;
- further promote energy efficiency improvements and the use of renewable energy sources;
- expand the use of economic instruments to include road pricing in urban areas and promote more environmentally sensitive fuel taxation; ensure that tax deductions for commuting by car continue to be in effect limited to rural areas, and eliminate incentives for private driving in the taxation of company cars;
- develop and implement a nationwide strategy to contain the increase in road traffic and strengthen vehicle traffic management and the use of public transport in urban areas.

Chemical products, waste and ecocycle policy

Since the 1980s, Sweden has followed key principles for the management of products and waste: the precautionary principle, the substitution principle, the waste hierarchy and producer responsibility. Sweden has been especially active in eliminating hazardous substances from products and waste, an area of growing significance as products have become a major source of hazardous pollution. Sweden stresses the role of producers in chemicals management and, more recently, in the ecocycle policy, an approach that gives producers general responsibility and broad flexibility in implementing measures.

Sweden has been a front runner among OECD countries in the field of chemical products management. The industry has considerable responsibility for assessing and classifying substances, and for removing harmful

substances when less harmful ones are available. Sweden has also established many substance-specific risk reduction programmes, some of which aim at complete phase-out. Within this framework, major changes in the market have reduced exposure to hazardous substances; most of the ambitious targets in these risk reduction programmes have been met or are expected to be met. Sweden has reached its target concerning agricultural pesticides (50 per cent reduction by 1990 from early 1980s levels, as measured by active ingredient) through a combination of regulations, information measures and voluntary measures supported by active participation of farmers; this reduction was achieved without net economic cost. Continued efforts should be made to ensure that policies to remove hazardous chemical substances from the market are the most cost-effective.

Waste management policy has focused on municipal waste rather than industrial waste. Recycling rates for some waste streams, such as paper/cardboard and aluminium cans, are very high in Sweden. Municipalities have implemented separate collection systems for household waste, including separation of hazardous waste, to promote recycling and ensure proper disposal. Energy from waste, in the form of landfill gas and heat from waste incineration, is highly utilised and constitutes a substantial part of the energy supply. Sweden has improved waste disposal practice since the 1980s; for example, air toxic emissions from incinerators have been reduced. Further effort is necessary, however, to improve smaller landfill sites and landfill practice. Legal frameworks for hazardous waste management and waste export and import have been improved. Sweden banned the export of hazardous waste to non-OECD countries in 1988. To progress further, Sweden should promote waste prevention, and strengthen proper management of industrial waste and of construction and demolition waste.

The 1993 ecocycle policy aims at establishing a broad framework for the management of products and waste, in order to minimise the use of natural resources and the resulting environmental impact. In practice, the policy focuses on promoting reuse and recycling, and reducing the amount and hazardousness of waste. The development of a policy framework is just beginning. Out of ten candidate product streams, ordinances have recently been implemented for packaging, paper and tyres. Ongoing work includes the preparation of regulations for other priority waste streams, the development of criteria for priority setting among various products and the surveillance of flows of material used in large quantities or containing hazardous substances.

As programmes related to products and waste have emerged separately in each policy area, their level of development varies from one area to another. Drawing from its experience so far, Sweden could proceed towards more comprehensive and balanced management of the whole spectrum of product streams. The framework of the ecocycle policy is a good basis for such work. Various policy instruments should be considered, including greater use of economic and information instruments.

It is therefore recommended that consideration be given to the following proposals:

- develop a systematic procedure for priority setting in risk reduction;
- evaluate the procedures for reporting to the product register to maintain its usefulness for overview and enforcement;
- improve landfill management with, inter alia, leachate treatment and prevention of hazardous waste contamination, especially at smaller sites;
- develop a strategy including a legislative framework and the provision of basic statistics, to improve industrial and construction/demolition waste management;
- initiate producer responsibility for other prioritised waste streams;
- for the management of products, identify priority areas and formulate medium- to long-term strategies with clear targets, based on current work on priority setting and survey of material flows;
- in the long term, continue efforts to co-ordinate policies related to products and waste in developing and implementing a cost-effective framework in line with the ecocycle principle; integrate chemicals policies further into the ecocycle principle as a means of detoxifying ecocycles.

Water

Its dense network of rivers, lakes and wetlands makes Sweden rich in water resources from both ecological and economic points of view. The quality of most inland waters is suitable for most uses. Sweden's performance in terms of municipal sewage treatment is among the best in the OECD: close to all urban households are provided with both biological and chemical waste water treatment, achieving removal rates of 90 to 95 per cent for biochemical oxygen demand, suspended matter and phosphorus, and 20 to 50 per cent for nitrogen. In response to the EU directive on urban waste water, all North Sea and Baltic Sea coastal communities with more than 10 000 inhabitants

are expected to be equipped for denitrification by 1998. Industry has significantly reduced its pollutant discharges (e.g. AOX), but remains the major source of oxygen-demanding substances. Emissions of some heavy metals to water (e.g. arsenic, chromium) have been strongly reduced. Water polluters and users pay for the treatment services, though no resource charges have been instituted for withdrawing water or discharging pollutants into natural waters.

However, mercury levels in pike still exceed international health standards in more than 40 per cent of Sweden's lakes. National emission objectives for cadmium remain to be met and elevated concentrations of toxic substances from industry, agriculture, contaminated sediments and mine tailings are still found in fish, birds and mammals. Acidification, mainly from transfrontier air pollution, remains a concern; liming programmes cannot provide a permanent solution. Nitrogen leaching from agricultural land has not yet been reduced sufficiently. The appropriate use and disposal of sewage sludge poses problems. The case-by-case approach to licensing discharges should be complemented by a greater emphasis on receiving water quality objectives. EU membership and the changing emphasis in Sweden's water problems may be reason to rethink some current approaches, and to move towards a river basin perspective and provide greater transparency as to the outcomes of water management activities.

It is therefore recommended that consideration be given to the following proposals:

- formulate a strategy for dealing with the environmental effects of intensive agriculture; expand the range of measures to reduce nitrogen leaching from agricultural land in the most cost-effective manner;
- give further attention to the appropriate use and disposal of sewage sludge;
- set risk-based priorities for cleaning up old mine tailings and other contaminated sites and draw up a long-term plan for the financing of remediation measures;
- step up efforts to reduce discharges of cadmium in order to meet North and Baltic Sea objectives;
- place greater emphasis on receiving water and ecosystem conditions (in relation to relevant EU water directives) and move towards a river basin perspective in water management;
- improve the transparency of water management enforcement activities through clear reporting of enforcement procedures and management outcomes.

Nature conservation

Sweden has an integrated body of laws promoting the conservation of nature, and the Riksdag has adopted a series of explicit policy objectives. A good knowledge base concerning biodiversity is continually updated through a joint effort of government, voluntary organisations and individuals. Protected areas receive a relatively high level of protection; elsewhere, policy instruments such as land use planning have been widely used to include nature conservation considerations in decision making. The new forest policy places equal priority on production and conservation, and a shift towards more sustainable forestry practices is under way, in part also due to market pressures. NGOs play an active role in managing and funding species recovery plans and extending knowledge about nature conservation. On the whole, the hunting management system adequately regulates management of the country's main game species.

Nevertheless, the state of Sweden's nature is still highly vulnerable. Biological and landscape diversity and the distinctiveness of Swedish flora and fauna have diminished. Pressures from forestry and agriculture have been the main sources of threats to biodiversity; changing practices in both sectors have been introduced only recently and have yet to prove their effectiveness. The proportion of land area set aside for nature protection is smaller and less representative of the major biomes than in many OECD countries. While 6.6 per cent of Sweden's total territory is legally protected, only 0.5 per cent of productive forest outside the mountain region is protected and relatively little attention has been paid to the protection of freshwater and marine habitats. More could be done to meet the parliamentary goal of preserving native species. Considering the task ahead, overall spending on nature conservation appears low, especially since a large part of present funding goes for compensation payments.

It is therefore recommended that consideration be given to the following proposals:

- accord higher priority to nature conservation;
- set quantitative targets in goals for protected areas, in terms of total area, representativeness and minimum size of individual parks and reserves, and step up the effort to reach these goals;
- create marine protected areas in the Swedish part of the Baltic Sea;
- implement the biodiversity action plan and make protection of biodiversity a basic principle of the proposed Environmental Code;

- further integrate environmental concerns in forestry policies and ensure that forestry practices evolve further towards a sustainable and environmentally conscious approach, with appropriate goal setting and monitoring of performance.

2. Integrating Environmental Concerns and Economic Decisions

Despite much progress in decoupling the generation of some environmental pressures from GDP (e.g. SO_x, NO_x, VOC and CO₂ emissions, water abstraction and pesticide use), Sweden's national objectives and international commitments call for not only cost-effective environmental policy but also a significant strengthening of the integration of environmental concerns in economic and sectoral decision making. Such integration is seen as a key to improving environmental performance and moving towards sustainable development. This is because economic forces and changes in major economic sectors, such as transport, energy, manufacturing, forestry and agriculture, strongly influence environmental conditions and trends, and thus can enhance or counteract the benefits of environmental policies and technical progress.

Integration and sustainable development

Sweden is supportive of the concept of sustainable development and is developing strategies to integrate environmental policy and other policies. Sweden's official view is that "growth must take place without additional damage or depletion of the national environment". Long-term strategies for environment and physical planning, with quantified objectives, have been developed. The ecocycle concept has been introduced to facilitate holistic approaches concerning hazardous substances. Sectoral policies now take environmental objectives into account. Long-term strategies have been developed for forestry, biodiversity protection and transport. Steps have been taken to reduce city traffic.

Economic instruments are being used to modify the use of natural resources and to decrease pollution. Energy taxation has been changed to increase taxation on CO₂ emissions through a carbon tax with a rate that is among the highest in Member countries, while the overall level of energy taxes was essentially unchanged. A NO_x charge has been introduced to reduce NO_x emissions, and is redistributed among emitters so as to remain revenue neutral. A number of environmentally differentiated taxes have been introduced to reorient use of polluting substances and products. Domestic airlines must pay a pollution charge (soon to be replaced by a different environmental charge) and users of fertilisers and pesticides pay a special tax on these products. After a few years of experience, it has been found that these taxes have helped in achieving targets without undue administrative cost.

In spite of considerable progress in institutional integration and the use of economic instruments, some difficulties continue to arise. While very constructive "internal" dialogue exists between the Ministry of the Environment, its boards and the regional and municipal authorities, the "external" dialogue between the environmental agencies and those in other sectors is developing. As a result of economic difficulties in the first part of the 1990s, priority was given to considerations of economic competition and the restructuring of industrial and social policies. In the future, the integration of environmental consideration into sectoral policies should be strengthened. Attention should be paid to the role of environmental expenditure as a potential moving force in policies concerning economic development and employment. If outstanding efforts have been made to give a role to local governments in the implementation of Agenda 21, it remains to be seen how local proposals will be integrated at the national level. Strong measures will likely be needed to modify consumption patterns. More precise objectives and targets for sustainable development will be required and greater efforts will be needed to reach the goals announced in 1993.

Environmental considerations are taken into account in development strategies for the transport and energy sectors. Emissions of hazardous air pollutants and CO₂ have been significantly reduced. However, trends in energy consumption and transportation use do not yet appear to have been reversed. Further steps could be taken to reduce and eliminate subsidies that are detrimental to environmental protection, particularly those that encourage use of private vehicles, facilitate rapid depletion of natural resources (e.g. topsoil) or impede conservation of natural resources.

As the legal system relies to a large extent on government institutions at the central, regional and municipal levels to take care of environmental concerns, the rights of the public and NGOs in monitoring application of laws are

very limited. While the role of citizens is very active within hearing and consultation processes, it is almost impossible for them to use the courts to force full implementation of the law.

It is therefore recommended that consideration be given to the following proposals:

- continue working towards greater use of economic instruments in order to promote better environmental and cost-effective policies; consider the possibilities to increase the rates of certain taxes in order to promote better consumption patterns, and introduce new taxes and charges without raising the overall tax ratio; promote international co-ordination of energy/CO₂ taxes;
- integrate environmental issues into all preparatory and decision making processes of the Government, including use of environmental impact assessments in strategic planning, especially as concerns energy and transport policies, and use voluntary agreements as appropriate;
- in connection with the proposals expected from the commissions on energy, transport and taxation, set precise objectives in these areas and deadlines for implementation;
- develop the environmental expertise and strategic capacity of the county administrative boards;
- complete the codification of environmental law and use this opportunity to: widen the scope of application of EIAs, increase the alternatives considered, and better define what EIAs must contain and monitor their quality; consider the option of litigation for individuals and NGOs concerning licensing decisions or non-enforcement of laws and regulations; give greater importance to ambient quality standards; continue integrating EU law into Swedish law;
- orient research activity towards multidisciplinary programmes emphasising more sustainable development and better controlled consumption patterns.

Sectoral integration: agriculture

In the mid-1980s, Sweden introduced a wide array of policies to contain the detrimental effects of modern agriculture on the environment, human health and animal welfare, and to safeguard the agricultural landscape. Its environmental goals for agriculture are generally ambitious and, thanks to high environmental awareness among farmers, well supported by the sector. A 1992 goal for a 10 per cent reduction in the total use of commercial fertiliser has been met, and one relating to pesticides (75 per cent reduction from early 1980s levels) will likely be met in 1996. Progress has been made towards the target of converting 10 per cent of the arable area to organic farming; and the programme of preserving 600 000 hectares of farm land of significant habitat value appears to be on track to meet its 1998 objective, as 70 per cent of the area is already covered by management agreements. Since the mid-1980s, Sweden has made effective use of charges and taxes on agricultural inputs as part of a broad mix of policy instruments; in the early 1990s it significantly increased environmental expenditure in agriculture.

However, implementation of habitat and landscape conservation agreements is hampered by a lack of clarity about what is to be achieved, and participating farmers do not always fully appreciate what is expected of them. Better follow-up and enforcement of individual agreements need to be built into the programme. Progress towards the objective of halving nitrogen leaching from agricultural land is lagging, and implementation and enforcement have not been strong enough; serious local eutrophication problems, and many less serious ones, remain. There is no evidence that ammonia emissions have been reduced since the objective was set in 1990, while measures taken in July 1995 have yet to prove their effectiveness. Policy makers need to take care that a switch to new, more biologically active, low-volume pesticides does not introduce new risks. While policies have been comprehensive, not enough attention has been given to optimising the cost-effectiveness of implementation. Also, integration of the various policy goals and related measures is only now beginning to be pursued to the point of developing a genuine strategy for sustainable agriculture with objectives for 2005 and 2021.

It is therefore recommended that consideration be given to the following proposals:

- strengthen follow-up and enforcement of measures concerning nature conservation and landscape in agricultural policies and practices;
- strengthen implementation and enforcement of regulations on nitrogen leaching;
- continue efforts to reduce ammonia emissions;
- continue monitoring the effects of pesticide risk reduction policies;
- improve integration of policy goals;
- give greater attention to cost-effectiveness aspects in policy design;
- develop a national strategy for sustainable agriculture, together with local implementation criteria.

3. International Co-operation

Sweden has very effectively promoted international co-operation on environmental protection issues and has supported its international programme with significant levels of human and financial resources. It initiated the concept of effect-related reduction protocols within the framework of the Convention on Long-range Transboundary Air Pollution and has been a driving force in the EU work towards a strategy on acidification. It has proposed realistic commitments and achieved concrete results. It has been a strong promoter of new approaches to transfrontier pollution prevention and control and, with other like-minded countries, has built an effective pressure group at the international level. Swedish diplomats and environmentalists have played a strong role in international negotiations. The Riksdag has given much attention to international environmental issues and has ratified international agreements rapidly. Sweden has promoted the adoption of overall goals at international level, concerning, for instance, restoration of the Baltic Sea area, and related targets (e.g. reduction of emissions of certain heavy metals by as much as 70 per cent); this approach has been fruitful, as considerable progress has been achieved by Sweden and other countries in the Baltic region.

For its part, Sweden has met its commitments concerning emissions of SO₂ into air and those concerning discharges into water of a number of pollutants, such as phosphorus and lead. It has taken expensive measures to reduce inputs of nitrogen in coastal waters (e.g. from waste water treatment plants). It has banned the production and consumption of a number of ozone-depleting substances ahead of internationally agreed deadlines and has taken vigorous steps to reduce its CO₂ emissions. Concerning aid to developing countries, Sweden is a large donor country in relative terms. Its aid budget is well above the Rio target of 0.7 per cent of GDP. Environmental co-operation with central and eastern European countries is progressing effectively.

In spite of these overall achievements, Sweden suffers from acid precipitation, resulting largely from transfrontier air pollution, and transfrontier water pollution in the Baltic Sea. Although international co-operation has made great progress, transfrontier pollution affecting Sweden has not been reduced as much as was hoped. Concerning emissions of mercury, cadmium and nickel, international targets for 1985-95 will not be reached by Sweden in relation to the North Sea and the Baltic Sea. Sweden was not able to halve its nitrate discharges to water by 1995, but will probably achieve the target by the end of the century. Emissions of NO_x to air will not be decreased by 30 per cent by 1998. CO₂ emissions will not be stabilised by 2000 without further measures. Environmental aid is probably growing, but this growth is at the expense of other aid. Pollution of the Baltic Sea is not decreasing as fast as expected because much of the problem has its source in central and eastern European countries. In particular, heavy metal concentrations in the Baltic Sea are still growing.

It is therefore recommended that considerations be given to the following proposals:

- ratify those agreements that Sweden has recently signed (Annex III);
 - adopt measures to decrease transfrontier pollution of Swedish origin from farming, sewage treatment, transport, etc., and continue active work in international forums to reduce transfrontier air pollution, in particular the emission of acidifying pollutants, and to promote strict vehicle emission control measures;
 - promote action to decrease air emissions of pollutants from ships in the Baltic Sea;
 - strengthen co-operation in the framework of the Helsinki Convention in order to reduce pollution loading of the Baltic Sea;
 - contribute to strengthening the prevention of maritime accidents in the Baltic area;
 - promote measures to reduce CO₂ emissions from transport and manufacturing industries and review the effect of energy taxation; continue to seek the most cost-effective instruments to promote energy conservation and use of renewable energy sources;
 - within the aid budget, increase the share of environmental aid and seek to restore the overall aid budget to reach the national goal of 1 per cent of GDP;
- continue environmental aid and technology transfer to central and eastern European countries.

