

Green Headline Indicators – Monitoring Progress towards Ecological Sustainability

This brochure presents the complete set of green headline indicators elaborated by the Swedish Environmental Advisory Council. The brochure is a summary of the Councils two Official Government Reports, SOU 1999:127 and SOU 1998:170. The twelve indicators provide the public and decision-makers with easily available and concise information about the progress being made in the transition to an ecologically sustainable society in Sweden. The aim is to monitor developments in strategic areas in order to highlight factors that are particularly important. The indicators can contribute to a livelier and more objective debate about sustainable development.

In the spring of 1999 the Swedish Government presented green headline indicators in the the Spring Finance Bill and Budget Bill. The Government intends to continue to report to Parliament about the development of the indicators.

Stockholm, December 1999

What is the purpose of green headline indicators?

Earth's ecosystems are threatened by pollution and overexploitation. Society must work towards sustainable development in ecological, economical and social terms in order not to jeopardize future generations' prospects of a good life.

A great deal of work and commitment will be needed for this process of adjustment to succeed. It is important that the public and decision-makers have access to easily available, concise and relevant information so that they can measure the progress made in these efforts. For this purpose, the Environmental Advisory Council has devised twelve green headline indicators in order to provide a readily comprehensible guide to whether progress is being made and, if so, if the rate of progress is satisfactory. The indicators thus represent a complement to the more detailed information that can be obtained elsewhere.

We have selected indicators that reflect changes in society in a broad ecological perspective, and our method is broadly similar to the models that have been developed internationally. It is important that green headline indicators designed to monitor the ecological transition to sustainability become a familiar concept, just like the generally accepted economic and social indicators such as measures of gross domestic product, unemployment etc.

International efforts in this area have so far concentrated on devising comprehensive systems for monitoring progress towards sustainability. Sweden and some other countries like Germany and United Kingdom are at the forefront of efforts to develop a small number of strategic indicators. Recently the EU started developing a small number of ecological indicators, which it calls Headline Indicators.

SUSTAINABLE DEVELOPMENT is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. We need a society that is ecologically sustainable, economically viable and attractive in social terms. Sustainable development must be based on an integrated approach and interaction between social, cultural, economic and ecological sustainability.

The term 'ecologically sustainable development' has been summarized by the Government in the following three objectives:

***Environmental protection:** emissions of pollutants must not harm human health or exceed nature's capacity for absorbing or breaking them down. Natural substances must be used in such a way as to ensure that natural cycles are maintained. The presence in the environment of man-made substances that are harmful to health and the environment should not be permitted in the long run. Biological diversity must be preserved and valuable cultural environments protected.*

***Sustainable supplies:** the long-term productive capacity of ecosystems must be assured. As far as possible, supply needs must be met by the sustainable use of renewable resources. This means that their use must not exceed the rate at which nature generates new resources and that materials must be recycled. We must, moreover, be economical with non-renewable resources and constantly seek renewable substitutes.*

***Efficient resource utilization:** energy and other natural resources can be used much more efficiently than they are today. Flows of energy and materials can be reduced to levels that are compatible with sustainable development. Community planning, technological development and investments should therefore concentrate on resource-efficient products and processes.*

What do green headline indicators tell us?

We have chosen to focus both on environmental problems and on important factors underlying these problems which make it necessary to implement the principles of ecological sustainability.

Pollutant emissions and environmental problems are largely caused by the enormous turnover of materials, chemicals and energy. It is therefore important to reduce material and energy turnover and switch to materials, chemicals and energy sources that make less impact on health and the environment. Three of the twelve indicators illustrate these underlying causes to environmental problems.

Five indicators are measures of emission levels or the state of the environment that relate to five serious environmental problems: the greenhouse effect, acidification, eutrophication, the quality of urban air and depletion of biological diversity.

If environmental problems are ever to be solved, many groups and sectors must begin to display greater environmental awareness. We must all take responsibility for reducing the impact on the environment. The remaining four indicators illustrate the pace at which various groups and sectors, such as consumers, enterprises, the public sector and schools, are moving towards an ecologically sustainable society.

All the green headline indicators are presented in this brochure. Each indicator is presented with a background description, the relevant objectives that have been set and, wherever possible at present, the development of the indicator.

Green headline indicators for monitoring adjustment to ecological sustainability

Measures of underlying causes (p. 5)

Measures of emission levels and the state of the environment (p. 10)

Measures of adjustment by important sector of society (p. 17)

- 1 - Use of energy
- 2 - Use of materials
- 3 - Use of chemicals

- 4 - Greenhouse effect
- 5 - Acidification
- 6 - Eutrophication
- 7 - Quality of urban air
- 8 - Biological diversity

- 9 - Environmentally sound means of transport
- 10 - Environmentally sound purchasing
- 11 - Recycling of nutrients
- 12 - Environmentally sound work practices

Measures of underlying causes

1. Use of energy

This indicator is measured in three ways:

- total energy consumption (TWh/year)
- energy efficiency, by relating energy use to GDP
- amount of electricity used to heat homes and other premises (TWh/year)

Background:

Society's use of energy exceeds the carrying capacity of the environment in several ways. The combustion of fossil fuels such as coal, oil and gas gives rise to emissions of acidifying substances and substances that aggravate the eutrophication of soil and water. Fine particles, hydrocarbons and heavy metals have an adverse impact on air and consequently on health and the environment. Furthermore, carbon dioxide, the main cause of the greenhouse effect, is formed in connection with combustion.

It is important to determine the consumption of energy in absolute terms in order to find out whether there is likely to be a reduction in the environmental impact. By linking energy use to GDP (the total value of all goods and services produced by the country) it is possible to compare changes in energy consumption in relation to the production of goods and services, and from this we can determine a value for the efficiency of energy use.

A large proportion of the electricity generated is used for heating. Since the 1970s, homes have become increasingly dependent on elec-

tricity for heating purposes. Today, almost one home out of four uses a direct electric heating system. If we did not need so much electricity to heat our homes during the winter it would be possible to reduce the production of electricity substantially, and this would in turn facilitate the phase-out of nuclear power that has just commenced.

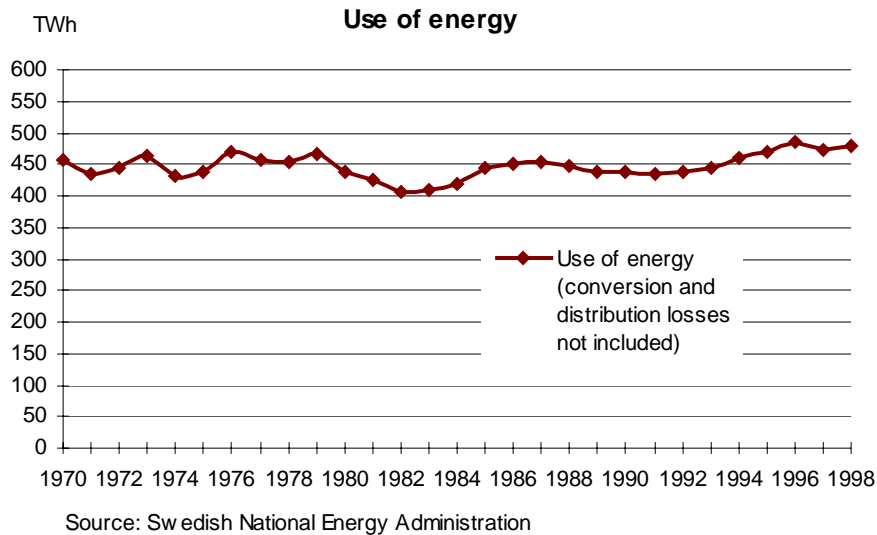
Objectives:

There is no quantitative objective adopted by the Government or the Parliament for this indicator, but the Government has declared that materials and energy should be used as efficiently as possible.

Development:

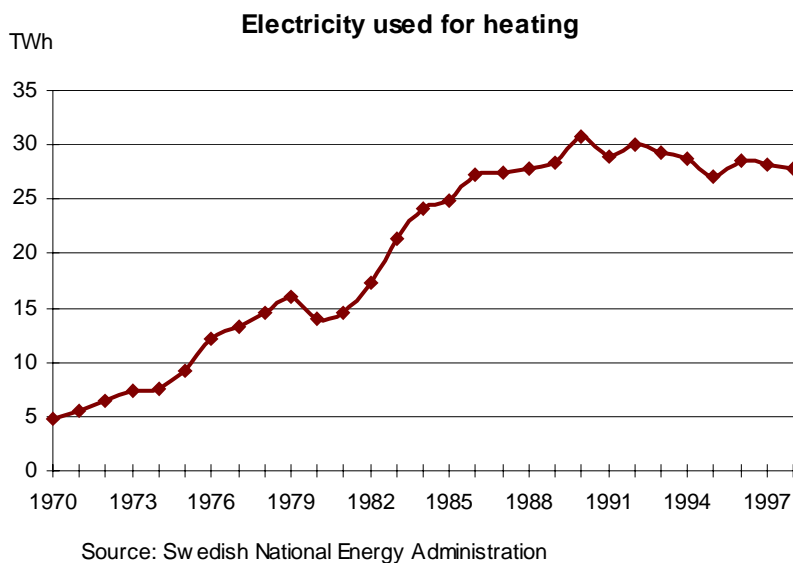
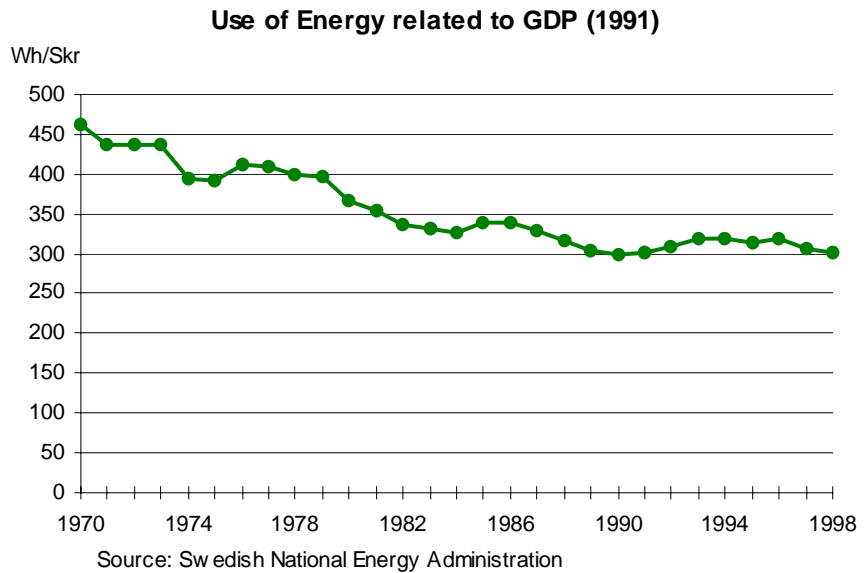
There appears to have been a gradual improvement in energy efficiency, but nonetheless total energy consumption has not diminished over the years. This is because we travel more, have more living space and use more electrical appliances. Energy consumption per square metre of living space has fallen by about one-third during the last 40 years. Nowadays it is possible to build a detached house with 100 sq. m. of living space that only consumes 6,000-8,000 kWh per year. This may be compared with the current average of 25,000 kWh per year. Another instructive example is that a refrigerator manufactured in the 1950s needed about 20 times as much energy as a modern refrigerator. However, increased consumption and increased affluence have cancelled out the gains made in energy efficiency.

The use of electricity to heat our homes and other premises has increased in recent decades, and have been almost constant on a high level during the 1990s.



The use of energy shows a slight increase in recent years

Energy use has become more efficient



Electricity used to heat homes and other premises has sharply increased

2. Use of materials

This indicator is measured in two ways:

- quantity of materials that come into circulation (tonnes per person per year)
- quantity of waste to landfill sites (tonnes per year)

Background:

The long-term productive capacity of ecosystems must be assured. For this reason we should use renewable resources, and the quantities of resources used should not exceed nature's capacity for breaking down residues and regenerating resources.

The turnover of materials affects the environment in several ways. We must be economical with finite resources such as metals, oil and gases, mainly because their use causes serious environmental problems. Some materials that are used in large quantities can have an affect on the balance even though they are not harmful in themselves. Examples of such materials are phosphorus and nitrogen which can cause eutrophication of lakes and seas, in particular due to nutrient leakage.

Material flows cause problems in connection with the extraction of raw materials, processing and production, during and after use and in connection with transportation at all these stages.

The main reason for reducing the influx of materials into society is the health and environmental risks that are associated with the materials themselves or with their handling. In the longer term, and in some cases in the short term too, it is prudent to use materials with caution also because they are scarce. The availability of land and water, for example, place constraints on the production of biomass. If the whole of the world's population were to consume the same quantities and types of food as the 20 per cent of the population that live in rich countries, this would both aggravate the environmental problems and lead to scarcity.

When a product is discarded after use and ends up in a landfill site, the constituent substances leak out into the environment sooner or later. We must therefore reduce the quantity of waste that is landfilled. Waste should preferably be minimized, then reused; where it cannot be reused, the materials should be recovered for recycling or the waste should be incinerated to recover the energy content. Only in the last resort should waste be landfilled.

Environmental activities are increasingly focusing on the problem of the enormous turnover and consumption of materials and products. The use of resources must become much more efficient, in the long run about ten times more efficient, if development is to be sustainable. This concept is often referred to as Factor 10.

Objectives:

The Government's objective is optimum efficiency in the use of resources. The Government states, in *Swedish Environmental Quality Objectives – An Environmental Policy for a Sustainable Sweden* ('the Environmental Bill'), that the Factor 10 concept can be used as a compass and to stimulate the necessary rethinking.

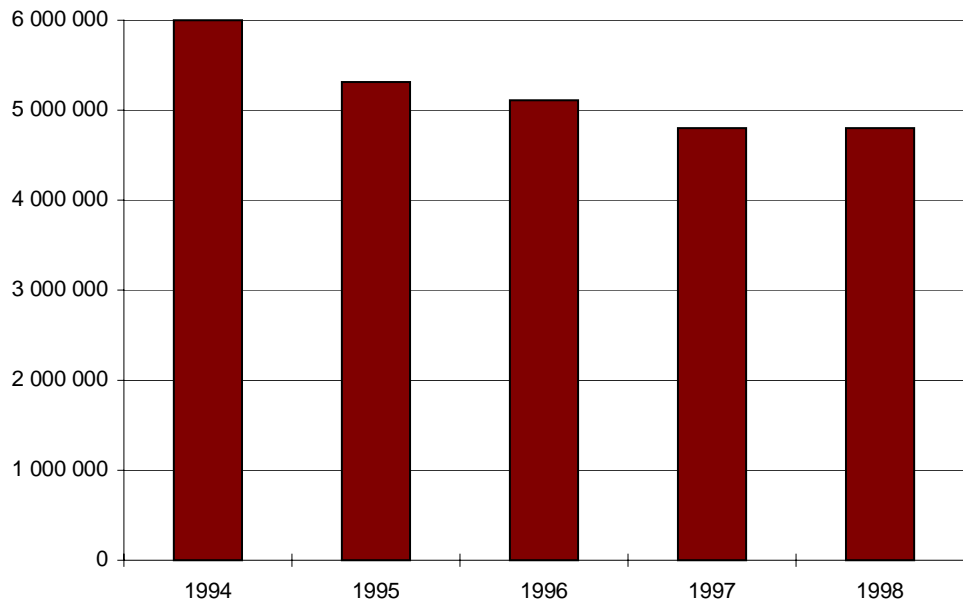
The Government has decided that a large proportion of the waste that is now landfilled must be reused or treated by recycling the materials or recovering the energy content. The landfilling of discarded combustible waste will be prohibited from the year 2002 and the landfilling of organic waste from the year 2005. The Government has also introduced a tax on waste that is landfilled.

Development:

Statistics on material turnover should be available by the spring of 2000 for a series of years. The quantity of waste that is deposited in landfill sites fell from 6.0 million tonnes in 1994 to 4.8 million tonnes in 1998. One reason for this is that we recycle a larger proportion of waste today.

tonnes of waste

Quantity of waste to landfill sites



The amount of waste that we put in landfill sites is decreasing

Source: Swedish Association of Waste Management

3. Use of chemicals

This indicator is measured in terms of:
– the volume of chemical products classified as harmful to health or the environment that are manufactured in or imported into Sweden (tonnes per person per year), excluding petroleum-based fuels.

Background:

One of the threats to ecologically sustainable development is the diffuse and large circulation of hazardous chemical substances at all stages of handling. If we are to achieve a sustainable society, we will have to phase out the use of the most hazardous substances.

An important measure in order to deal with the risks involved in handling chemicals, is the classification and labelling of chemical products on the basis of their hazardous characteristics. Carcinogenic or allergenic characteristics, or toxicity to humans or other living organisms, are examples of characteristics on which the classification is based.

The reason why petroleum-based fuels although classified as hazardous have been excluded is that the volume of this product group is so large and dominant that it would be difficult to detect significant changes in other groups if it was included. The extensive use of petroleum-based fuels is reflected, however, in the indicators Use of energy and Greenhouse effect.

Objectives:

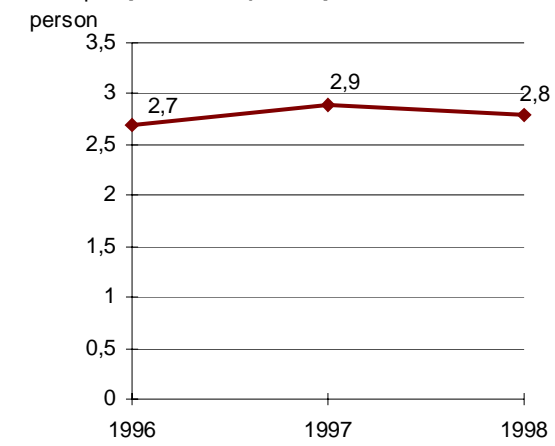
The Government and Parliament (and in some cases the National Chemicals Inspectorate) have prohibited or restricted the use of particularly hazardous substances such as ozone depleting substances, DDT, PCBs, mercury, lead and cadmium. According to the chemical guidelines issued by the Government, the use of substances that have serious or chronic adverse effects should be discontinued. Persistent substances that accumulate in living organisms should no longer be used in products that are released to the market.

Development:

In 1998 about 25 million tonnes of chemical products, classified as harmful to health or the environment (not including the large quantities of petroleum-based fuels), came into circulation in Sweden. This is the equivalent of about 2.8 tonnes per person. There was a slight increase between 1996 and 1998, which may be attributed to the economic boom during the period.

The number of classified hazardous substances increased during the period 1996-98 from 2,375 to 3,213. To make it possible to determine to what extent an increase in volume is due to an increase in the number of classified substances, the volume will in future be calculated on the basis of the number of classified substances in 1999 and the number for the year in question.

Quantity of hazardous chemical products (excl. petroleum-based fuels)



Source: National Chemical Inspectorate

The amount of hazardous chemicals is high, and shows a slight increase

Measures of emission levels and the state of the environment

4. Greenhouse effect

This indicator is measured as:
– emissions of carbon dioxide (tonnes per year) into air

Background:

Ever since the dawn of industrialization, the atmosphere's content of many gases that contribute to the greenhouse effect or global warming has increased as a result of human activities. Carbon dioxide is the most important greenhouse gas by volume that is produced as a result of human activities.

A natural greenhouse effect is essential for life on earth, but an abnormal increase in carbon dioxide levels raises the earth's temperature too. This may in turn lead to a rise in sea level, as a result of which large coastal areas would probably be submerged or flooded. From a global point of view, the levels of greenhouse gases in the atmosphere must be stabilized at levels that ensure that human activities do not disrupt the climate system.

Carbon dioxide is emitted mainly as a result of the combustion of fossil fuels (oil and gas in particular) in the transport and energy sectors and in manufacturing.

To reduce these emissions it is necessary both to use energy more efficiently and to switch from fossil fuels to alternative sources of energy.

About one-third of carbon dioxide emissions are due to the activities of individuals, including emissions from boilers in houses, cars, motorboats and mobile machinery. Enterprises too must take responsibility by designing products that are more energy-efficient and can be run on fuels other than fossil fuels.

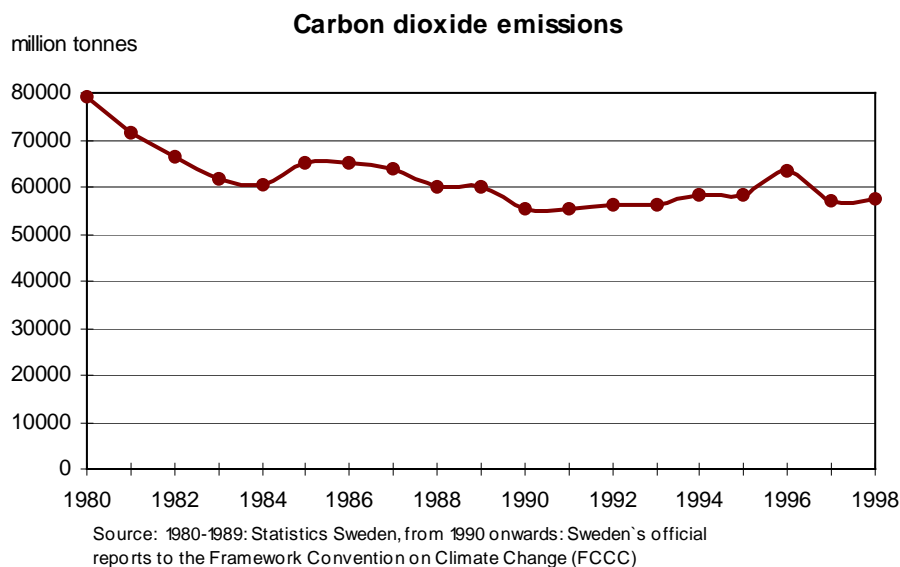
Objectives:

Parliament has decided that emissions of fossil fuels in 2000 should not exceed 1990 levels and should decrease after 2000. The EU has undertaken to reduce emissions of greenhouse gases by 8 per cent by 2012 compared with 1990 levels.

In 1997 the industrialized countries agreed, pursuant to the UN Framework Convention on Climate Change, to reduce their emissions of greenhouse gases by 5.2 per cent compared with 1990 levels during the period 2008-2012.

Development:

Emissions of carbon dioxide have almost halved since 1970, thanks mainly to more efficient use of energy, structural adjustment in industry and the development of nuclear power. Sweden's emissions of carbon dioxide per capita or in relation to GDP are among the lowest of all the OECD countries. However, these emissions have increased in the 1990s. This is due mainly to the increased use of fossil fuels for the purposes of electricity and heat production and to the increase in transport volumes.



The emissions of carbon dioxide has decreased during the 1980s

5. Acidification

This indicator is measured in two ways:

- emissions of sulphur dioxide into air (tonnes per year)
- emissions of nitrogen oxides into air (tonnes per year)

Background:

Acidifying emissions have a variety of adverse effects, in particular on forest land, lakes, streams and groundwater. Many species have disappeared from acidified lakes. Together with other pollutants, acidifying substances also affect human health. These emissions have also had a damaging effect on cultural monuments and buildings, and a large number of ancient rock-carvings will be completely obliterated in 20 years if the stone continues to crumble at the present rate.

Acid depositions are stored in the soil and it takes a long time to repair the damage. Even if the depositions cease, it will take at least 50-100 years for the soil to recover completely. Swedish soils are susceptible to acidification, and a large proportion of the forest land in the south of Sweden is now acidified to a depth of several metres. In order to reduce the damage caused by acidification, about 7,500 lakes and 700 streams are limed every year in Sweden, but despite these measures about 17,000 lakes are acidified.

Acidification is caused by emissions of sulphur dioxide and nitrogen oxides, which are transformed in the air into acid substances and

are often deposited in areas far away from the emission source. These emissions come mainly from energy production sources such as coal- and oil-fired power plants, industrial plants of various kinds, mobile machinery, shipping and road and air traffic. 20-30 percent of the acid rain in Sweden is of domestic origin,

while the rest is imported from other countries, including Germany, the UK, Poland and Denmark. By the same token, emissions from Sweden are exported to other countries.

It will only be possible to reduce acidification in Sweden if our European neighbours drastically reduce their overall emissions of acidifying substances. Emissions of sulphur dioxide from international shipping in the North Sea and the Baltic Sea will have also to be reduced substantially.

Objectives:

The Governments target for Sweden's emissions of sulphur dioxide with a reduction of 80 per cent during the period 1980-2000 has been achieved. A new target that has been adopted is a 25 per cent reduction in Sweden's emissions of sulphur dioxide into air by 2010 compared with 1995 levels.

The Government has proposed setting a target of a 40 per cent reduction in emissions of nitrogen dioxides from the transport sector by

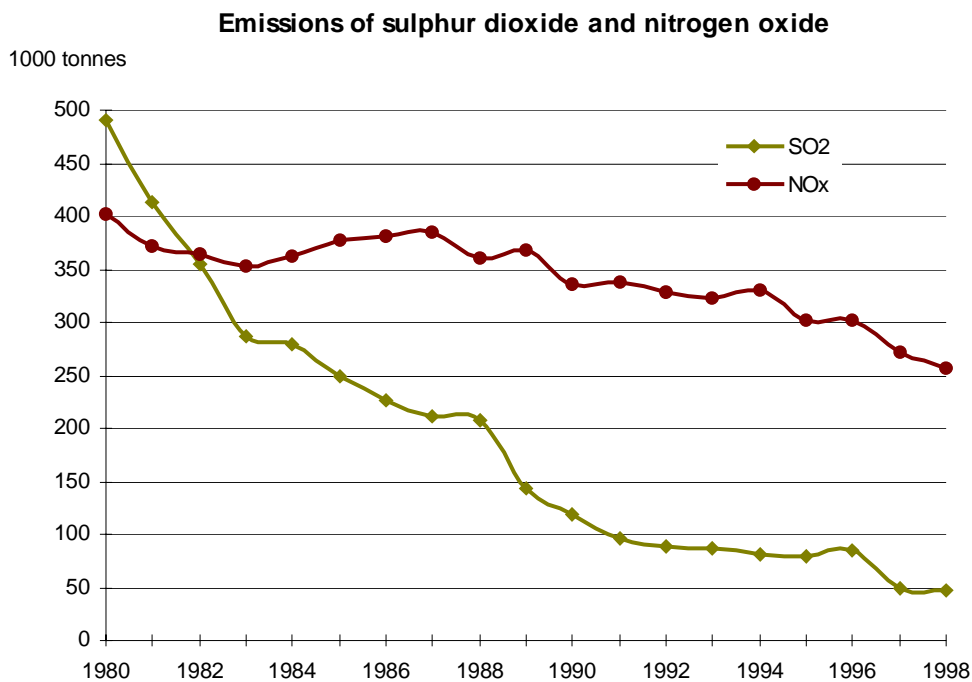
2005 compared with 1995 levels. The previous target was a 30 per cent reduction by 1995 compared with 1980 levels.

Development:

Emissions of sulphur dioxide dropped by over 80 per cent and emissions of nitrogen oxides by 15-25 per cent between 1985 and 1995. These reductions were mainly the result of improved emission control technologies, a

reduction in the sulphur content of oil and a changeover from oil to electricity. A number of old industrial plants have also been closed. The previous target of a reduction in emissions of nitrogen oxides by 30 percent was not met until 1997, mainly due to the increase in travel. In addition, emissions of nitrogen dioxides from offroad mobile machinery and shipping turned out to be more significant than was originally estimated.

Emissions of acidifying substances has decreased, but further reductions are needed to reach target levels.



Source: Statistics Sweden and Swedish EPA

6. Eutrophication

This indicator is measured in two ways:

- the phosphorus load entering the surrounding seas (tonnes per year)
- the nitrogen load entering the surrounding seas (tonnes per year)

Background:

All plants and animals need nourishment, including nitrogen and phosphorus. But too much nitrogen and phosphorus can cause imbalances.

During this century there has been a marked increase in nutrient salts in our lakes and seas as a result of human activities. This has caused eutrophication of lakes and seas, which has in turn affected biological diversity. From the coast of Norway in the west to the Sea of Åland in the east, the sea is severely eutrophied in places. There is also an excess of nutrients in about one lake out of six. It takes a long time for a reduction in emissions to take effect in the environment and to restore acceptable nutrient levels. If we wish to achieve ecological sustainability in the Baltic Sea within a century, then we will have to take measures to reduce the leakage of nutrients today.

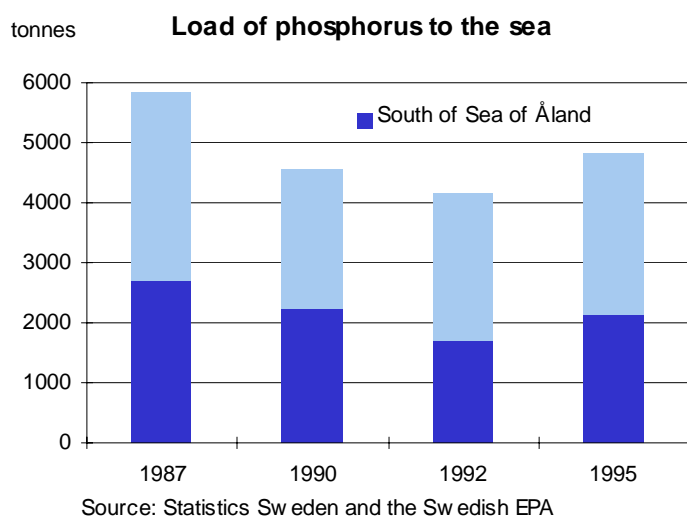
Eutrophication is the result of phosphorus leaking into streams and lakes and of nitrogen emissions into air and water. The main sources of these emissions are traffic, agriculture and wastewater. Eutrophication causes oxygen depletion, particularly in bays and archipelagoes. As a result, fish and mussels disappear and lobsters and other bottom-dwelling (benthic) animals are eliminated. The data on the load of nitrogen and phosphorus in the diagram below relate to inputs into the sea from sewage treatment plants, industry and agriculture.

Objectives:

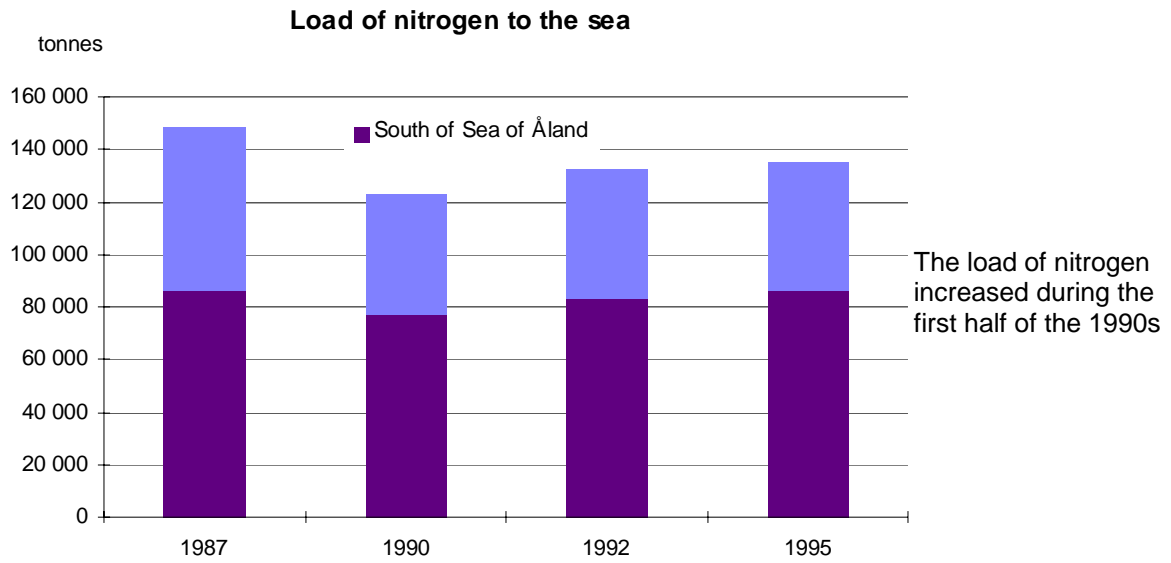
The Government's objective is a reduction of 40 per cent waterborne discharges of nitrogen from human activities into the sea south of the Sea of Åland compared with the levels in 1995. The declared objective of the contracting parties to the Helsinki Commission, the OSPAR Convention and the North Sea Conference is a 50 per cent reduction in the nutrient salt load in the Baltic Sea.

Development:

The load of phosphorus into the sea diminished at the end of the 1980s and early 1990s, but it has increased again in recent years. The nitrogen load increased during the period 1991-95. The targets set previously were not met. Data for 1998 will be available at the start of 2000.



The load of phosphorus to the sea is increasing again



Source: Statistics Sweden and the Swedish EPA

7. Quality of urban air

This indicator is measured in terms of:

– benzene levels in urban air (microgram per cubic metre of air as a mean level for the colder half of the year)

Background:

The quality of air in urban areas affects people's health. In a sustainable society the air must be so clean that it does not damage human health, animals, plants or cultural monuments. Generally speaking, air quality has improved considerably in the last decade or two, but a number of problems remain to be solved.

Benzene levels indicates the general quality of the air in urban areas. Benzene is a carcinogenic substance that is formed in connection with combustion, and the main source of emissions is motor traffic. Locally, wood-fired

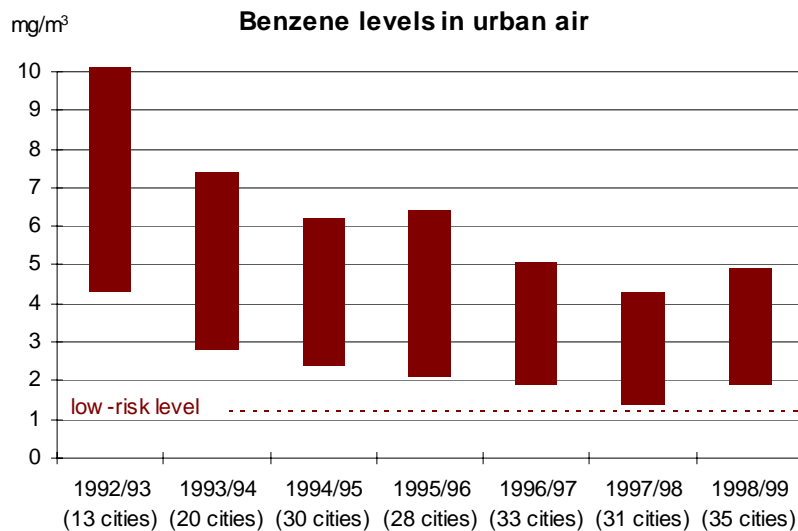
heating can be a problem too. Currently, benzene emissions account for about 30 cancers a year in Sweden. The low-risk level for benzene established by the National Institute of Environmental Medicine as a long-term mean level is $1.3 \mu\text{g}/\text{m}^3$ (a level equivalent to a lifetime cancer risk of 1 in 100,000). This value is based on guidelines issued by the World Health Organization (WHO).

Objectives:

Parliament has decided that emissions of carcinogenic substances, including benzene, must be halved by 2005 compared with 1995 levels.

Development:

Benzene levels in urban air declined in the 1990s, due mostly to the lower content of benzene in petrol and the use of catalytic converters in petrol-driven cars. But winter benzene levels are still above the low-risk level in most urban areas.



Source: Statistics Sw eden

Benzene levels in urban areas have decreased but are still above the low-risk level.

8. Biological diversity

This indicator is measured in two ways:

- an index based on certain conditions prevailing in four important habitats (forests, lakes, farmland, seas)
- protected forests as an annual percentage of productive forest land

Background:

There are about 50,000 plant and animal species in Sweden. In the case of certain groups of species, such as mosses and lichens, Sweden has as many species as tropical rainforests, and several species in these groups account for a significant proportion of the European population. The immediate reason why species fail to survive in an established locality is that their habitats are altered or destroyed. This indicator reflects conditions that are important for the preservation of biological diversity in Sweden in each of the habitats *Forests*, *Lakes*, *Farmland* and *Seas*. Changes in these conditions have a positive or negative effect on diversity.

In the case of forests, we have also selected a measure that reflects society's efforts to preserve biological diversity by protecting forests. Protected forests are defined in the Swedish Environmental Code as forests in national parks, nature reserves and habitat protection areas. Protected forests in Crown reserves also fall within this definition.

Forest land of high biological value must be protected in order to preserve the large number of plant and animal species there. Logging and coniferous monocultures

greatly affect the number of plant and animal species in forests. When the number of standing and downed dead trees in a forest diminishes, the number of plants and animals diminishes too. In a managed forest there will normally only be a small percentage of dead wood, while in virgin forests dead wood is likely to account for about 25 per cent of the total.

Objectives:

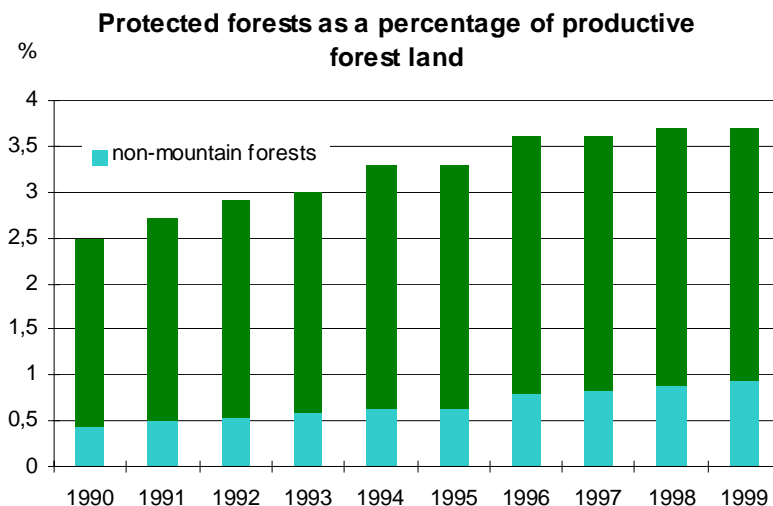
The need to preserve and protect biological diversity is mentioned in several of the environmental quality objectives adopted by Parliament.

The Government's objective is to establish 250,000 ha of protected forests in nature reserves etc. and about 25,000 ha in habitat protection areas. If this objective is achieved, the percentage of protected forests will increase to almost 5 per cent. Further resources were allocated for purchases of land in the 1999 Spring Finance Bill.

Development:

Statistics for conditions in the Forest and to some extent for the Farmland habitat should be available in 2000. The remaining statistics for all conditions should be available by autumn 2000.

The percentage of protected forests increased between 1990 and 1996, from 2.5 to 3.6 per cent. About 80 per cent of the forests that are protected today are submontane forests. In future, priority should be given to non-mountain forests.



Source: National Board of Forestry and the Swedish EPA

The percentage of protected forests is slowly increasing

9. Environmentally sound means of transport

This indicator is measured in two ways:
– percentage of journeys to and from work and school made on foot, by bicycle or by public transport (per cent per year)
– number of kilometres travelled by car (km per person per year)

Background:

Road traffic is the main source of air pollution and noise, especially in urban areas. Motoring is therefore an extremely important factor in adjustment to an ecologically sustainable society. Emissions from cars and the use of the motor car itself must be reduced.

Catalytic converters for petrol-driven cars have led to great improvements. Cars that meet the 1989 emission standards release about 80 per cent less hydrocarbons and 70 per cent less nitrogen oxides than those produced only a few years earlier. However, catalytic converters make no difference to emissions of carbon dioxide.

Continuing technological development, can help to reduce pollutant emissions. Environmentally sound fuels must also be developed. Nonetheless, if the overall volume of motor traffic continues to increase, the reduction of emissions will not be sufficient. Traffic planning programmes and an increase in the use of public transport are therefore essential if we are to succeed in reducing pollutant emissions to acceptable levels.

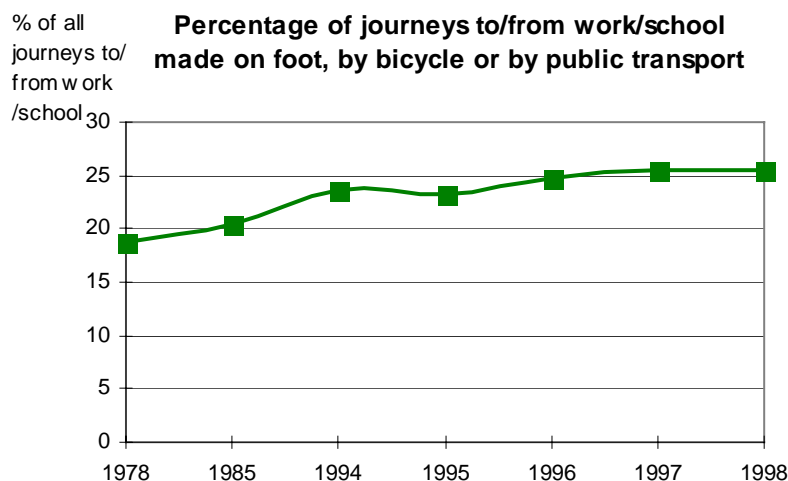
Individuals can play a part in reducing the pressure on the environment by their choice of means of travel. In urban areas, in particular, it is often possible to avoid travelling to and from work by car.

Objectives:

There is no specific objective from the Government or Parliament for this indicator.

Development:

The changes in this indicator show that the percentage of environmentally sound travel to and from work has increased from 20 to 25 per cent between 1978 and 1998 and that car travel has increased and is at a high level.

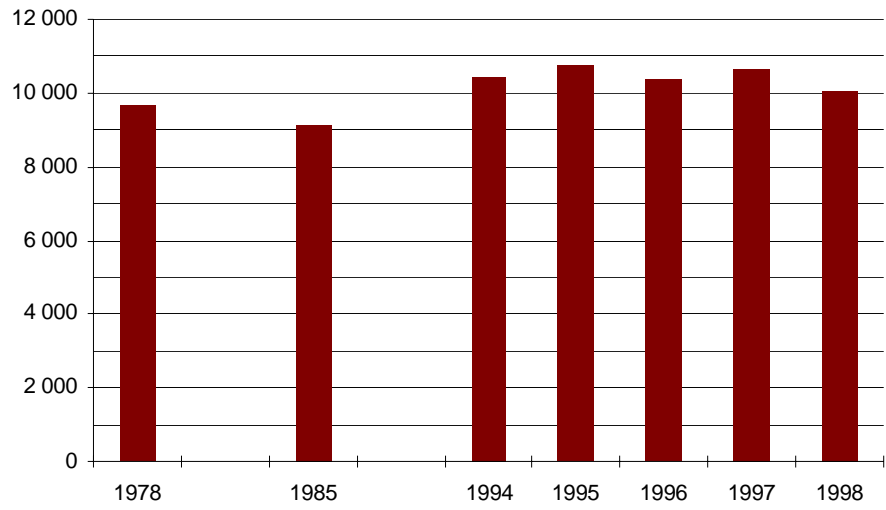


Source: National Travel pattern Survey (8000 respondents)

The use of environmentally sound means of transport is increasing

km/person

No. of km travelled by car per person



Source: National Travel Pattern Survey (8000 respondents)

10. Environmentally sound purchasing

This indicator is measured in two ways:
– the value of purchases of ecolabelled products and services (SEK per person per year)
– the value of green public procurement (SEK per year)

Background:

Environmentally sound behaviour and the choices of products and services made by consumers, enterprises and the public sector are a significant factor to achieve ecological sustainability.

Ecolabelled products and services make less impact on the environment compared with other products on the market. Ecolabelling systems are continuously being developed with a view to reducing environmental impacts still further. This indicator monitors consumers' contribution to a sustainable society by their purchasing behaviour. The indicator is based on statistics from ecolabel organizations (e.g. the Nordic Swan ecolabel, the EU flower logo, and the Swedish Society for Nature Conservation)

The indicator also monitors the reorientation of public procurement towards ecologically sustainable goods and services.

Objectives:

One objective of the Government's consumer policy is to develop consumption and production patterns that reduce the pressure on the environment and contribute to sustainable development.

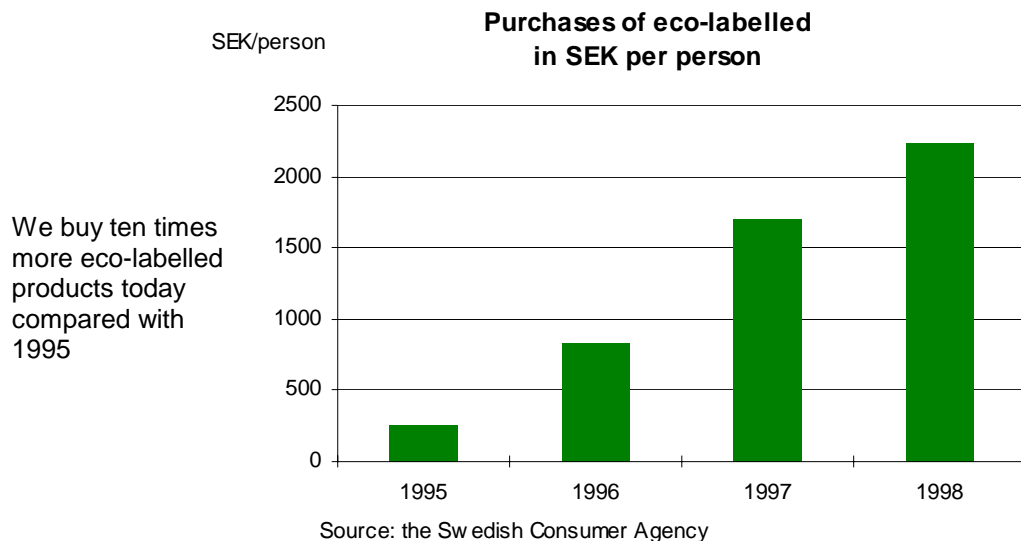
The Government has emphasized the importance of changes in consumer behaviour and increased environmental awareness and knowledge as elements of a consumer policy for ecological sustainability.

Neither the Government nor Parliament has set any specific objectives relating to green public procurement. The Government has declared that the procurement operations of central and local government, involving as they do large volumes and long-term supplies, can promote environmentally sound technological development by enterprises. A commission has been given the task of presenting proposals in this area to the Government in 2000.

Development:

The changes in this indicator show that there has been a sharp increase in purchases of ecolabelled products. In 1998 Sweden's consumers bought ecolabelled products for SEK 2,240 per person, which is almost ten times as much as in 1995, when the figure was SEK 250. Sales of ecolabelled products in 1998 totalled about SEK 19 billion. Between 1995 and 1998 the number of ecolabelled products on the market increased from 1,852 to 4,039.

Data on public procurements in which environmental requirements are specified are expected to be available in 2000.



11. Recycling of nutrients

This indicator is measured as:

– the quantity of phosphorus from sludge annually recycled to cultivated land as fertilizer (tonnes per year)

Background:

Phosphorus is of vital importance to humans, plants and animals. But the use of phosphorus in such a way as to cause leakage from agricultural land into lakes, streams and seas is liable to lead to eutrophication, algal blooms and oxygen depletion. It is therefore important to use phosphorus efficiently and to achieve a functioning phosphorus cycle.

Artificial fertilizer is sometimes used in order to replace the phosphorus that leaks into seas and lakes. Most of the phosphorus in such fertilizer is extracted from non-renewable sources. Phosphorus is also an ingredient of the sludge produced by sewage treatment plants, and some of this is recycled to arable land. However, this sludge sometimes contains high levels of heavy metals and organic toxins, and for this reason only sludge that meets the existing guideline values is recycled. Together with the Federation of Swedish Farmers and the Swedish Water & Wastewater Association, the Swedish Environmental Protection Agency has issued relevant guideline values.

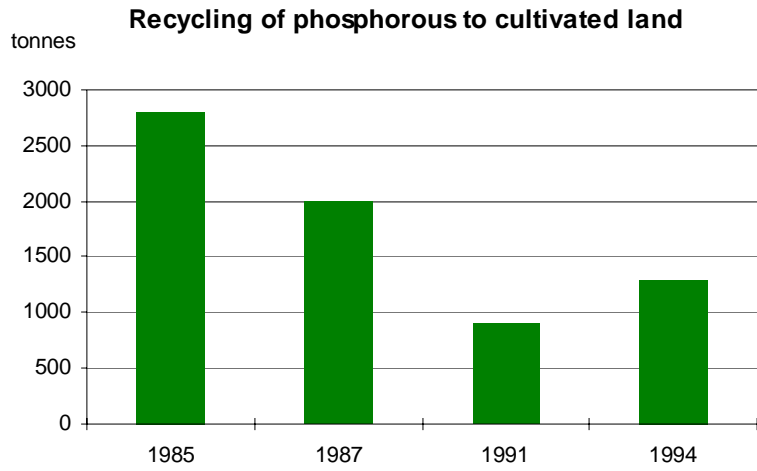
The indicator shows the quantity of phosphorus in sludge that is recycled to cultivated land. Improving the phosphorus cycle and reducing phosphorus losses by this method has the added advantage of also recycling substances such as nitrogen, potassium and organic matter to arable land. The quantity of phosphorus recycled in this way can therefore be used as an indicator of the management of these substances too. In the future new technologies may make it possible to recycle phosphorus by other methods, and in that case this can also be monitored.

Objectives:

The Government has proposed that closed cycles for nutrients, especially phosphorus, and organic matter should be created between urban and rural areas.

Development:

The changes in this indicator show that the recycling of phosphorus from sludge diminished between 1985 and 1991, but that it has increased since then. In 1995 about one-third of all the sludge produced was recycled, and the rest was deposited on landfill sites. New data will be available by the spring of 2000.



Source: Statistics Sweden and the Swedish EPA

The recycling of phosphorous is increasing again

12. Environmentally sound work practices

This indicator is measured in two ways:
– enterprises with environmental management systems (number of enterprises per year)
– schools that have received the Green School Award (number of schools per year)

Background:

It is important to develop tools for integrating environmental concerns into the activities of various stakeholders. The development of environmentally sound products by enterprises and teaching about ecological matters are crucial to the achievement of ecological sustainability.

Enterprises must make a major contribution if the adjustment process is to be successful. Their products impact the environment throughout their lives, from extraction of the raw materials to manufacturing and use and in connection with transportation at all these stages. Service providers can also improve overall environmental performance by making sound choices in connection with purchasing, transport arrangements etc. Many enterprises are already taking action to protect the environment beyond the statutory requirements.

Annual surveys of the number of enterprises that are awarded EMAS or ISO 14001 certificates for their environmental management systems provide a measure of industry's integration of environmental performance into its operations.

The purpose of voluntary environmental management systems is to give private enterprise and public services a tool that will help them to conduct preventive and cost-effective environmental programmes. These systems are based on the application of transparent guidelines and objectives, a well-defined division of responsibilities and procedures for monitoring environmental performance and accounting for results. A fundamental requirement is that the operations must constantly be improved. Environmental management systems are therefore a

significant instrument for improving the environment.

The European Union's environmental management system is called the Eco-Management and Audit Scheme (EMAS) and the international standardization body ISO's system is ISO14001. Both these systems are designed to establish work practices that promote positive environmental action. EMAS, for example, requires enterprises to present audited and approved environmental accounts every year.

When it comes to schools, pupils must be taught about ecology at an early stage. Education provides knowledge that is crucial to the promotion of sustainable development and enhancement of our capacity for solving environmental and development problems.

Monitoring the number of schools that receive the Green School Award in accordance with the criteria laid down by the National Agency for Education will make it possible to measure the degree of schools' success in integrating environmental concerns into their activities. The purpose of the award is to stimulate broad-based implementation of good environmental education. According to the Agency's criteria, environmental concerns are to be an integral part of school education and a pro-environment philosophy should also characterize school activities in general. The Green School Award will also be given for environmental activities undertaken on a continuous basis and constantly improved.

The indicator relates to the important work of adjusting to ecological sustainability that is being done in pre-schools, compulsory schools, upper secondary schools and adult education colleges. It is important that education about ecological basics are integrated into higher education as soon as possible.

Objectives:

There is no specific objective from the Government or Parliament for this indicator. The Government has, however, presented an action programme for ecologically sustainable

development in education, which includes that an ecolabelling system should be introduced for schools.

Development:

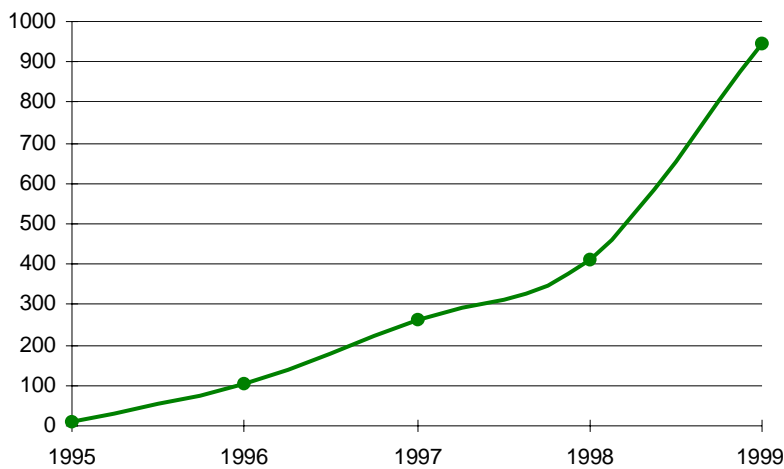
The number of enterprises that have introduced environmental management

systems is constantly growing, although they still only represent a fraction of all enterprises.

Data on the number of green schools will be available in a year or so at the earliest. The first Green School Award will probably be made in 2000.

total no. of EMAS / ISO 14001 certified enterprises

Number of enterprises with environmental management systems



Source: Statistics Sweden

The number enterprises with EMAS or ISO 14001 certificates has sharply increased in the past

The Environmental Advisory Council – adviser to the Government on environmental matters

The Swedish Environmental Advisory Council, which was set up in 1968, advises the Government on environmental matters. The Council's task is to develop proposals on measures that are conducive to a sustainable society.

The Council is currently working on the following three tasks:

- Ecologically sustainable trade and industry
- Sustainable development in Sweden's archipelagoes
- Green Headline Indicators

Members of the Environmental Advisory Council

Chair: Jan Bergqvist
Member of Parliament and chair of the Parliamentary Standing Committee on Finance

Åsa Domeij
agronomist, Swedish University of Agricultural Sciences

Stefan Edman
biologist, writer and Political Adviser at the Ministry of the Environment

Karin Jonsson
Managing Director, Stockholm Vatten AB

Kerstin Lövgren
research coordinator, MISTRA

Maria Norrfalk
Director-General, National Board of Forestry

Thomas Rosswall
Vice-Chancellor, Swedish University of Agricultural Sciences

Marja Widell
environmental auditor, Asea Brown Boveri

The following members of the Environmental Advisory Council's secretariat were involved in the production of this brochure: Maria Delvin and Nils Höglund, experts, and Siv Näslund, Administrative Director.

This brochure presents the complete set of Green Headline Indicators elaborated by the Swedish Environmental Advisory Council, as requested by the Government. The twelve green headline indicators provide the public and decision-makers with readily available and concise information about the progress being made in the transition to an ecologically sustainable society in Sweden. The indicators monitor developments in areas that are particularly important for the achievement of an ecologically sustainable society.

The brochure is available on the following websites:

www.environmental.council.gov.se

www.mvb.gov.se

The above websites also contain the summary of the report "Green Headline Indicators – Monitoring Progress towards Ecological Sustainability" (SOU 1999:127).