

The Environmental Advisory Council proposes green headline indicators for the following twelve areas

<p>Measures of underlying causes</p>	<p>Use of energy</p> <ul style="list-style-type: none"> - Total energy use - Energy efficiency - Electricity for heating purposes <p>Use of materials</p> <ul style="list-style-type: none"> - Total material requirement - Quantity of waste to landfill sites <p>Use of chemicals</p> <ul style="list-style-type: none"> - Total volume of chemicals that are harmful to health or the environment
<p>Measures of emission levels and the state of the environment</p>	<p>Greenhouse effect</p> <ul style="list-style-type: none"> - Emissions of carbon dioxide <p>Acidification</p> <ul style="list-style-type: none"> - Emissions of sulphur dioxides into air - Emissions of nitrogen oxides into air <p>Eutrophication</p> <ul style="list-style-type: none"> - Load of phosphorus into the sea - Load of nitrogen into the sea <p>Quality of urban air</p> <ul style="list-style-type: none"> - Benzene level in urban air <p>Biological diversity</p> <ul style="list-style-type: none"> - Habitats for biological diversity - Percentage of protected forests

Measures of adjustment by important sectors of society	Environmentally sound means of transport
	<ul style="list-style-type: none"> - Percentage of travel by public transport - Passenger transport by car
	Environmentally sound purchasing
	<ul style="list-style-type: none"> - Purchases of ecolabelled products - Ecologically sustainable public procurement
	Recycling of nutrient
	<ul style="list-style-type: none"> - Recovery of phosphorus to cultivated land
	Environmentally sound work practices
	<ul style="list-style-type: none"> - Enterprises with environmental management systems - Schools that receive the Green School Award

Green headline indicators previously described in 1998 in the report **Green key indicators for ecologically sustainable development** (SOU 1998:170) were the following:

- Use of energy and energy efficiency
- Electricity for heating purposes
- Emissions of carbon dioxide
- Benzene level in urban air
- Emissions of acidifying substances (sulphur dioxides and nitrogen oxides)
- Environmentally sound means of transport
- Enterprises with environmental management systems (EMAS and ISO 14001)
- Waste to landfill sites
- Load of phosphorus and nitrogen into the sea
- Recovery of phosphorus to cultivated land
- Percentage of protected forests

In the spring of 1999 the Government presented these green headline indicators in the budget statement annexed to the Spring Finance Bill. The Environmental Advisory Council proposes that the Government continue to describe the progress made on green headline indicators to Parliament every year in the Spring Finance Bill or the Budget Bill.

In the development of this report, we have decided to change the structure of the indicators compared with our previous report in order to make it quite clear what is being monitored. All the indicators presented in 1998 are included in the new structure but it has in this report been necessary to change the names of the previous indicators. For example the percentage of protected forests is now presented as one way of measuring the indicator Biological diversity. This has resulted in a complete set of twelve green headline indicators.

The five areas for which we propose green headline indicators in this report are:

Biological diversity

- Habitat variety

Use of chemicals

- Hazardous chemicals

Use of materials

- Total material requirement

Environmentally sound purchasing

- Purchases of ecolabelled products
- Green public procurement

Environmentally sound work practices

- Green School Award

Selection criteria for indicators

- The indicators must reflect conditions that are strategically relevant for the transition towards an ecologically sustainable society.

Green headline indicators are formulated with reference to the three objectives, **Protection of the environment, Efficient use of resources and Sustainable supplies of natural resources**, which summarize the concept of ecologically sustainable development set out in [Swedish Environmental Quality Objectives – An Environmental Policy for a Sustainable Sweden](#) (Gov. Bill 1997/98:145, summary in English available here, pdf format). We have chosen to focus on both environmental problems and on strategic factors underlying the problems which are necessary to adjust to reach ecological sustainability.

- The indicators must be limited in number

The Environmental Advisory Council seeks to keep the number of indicators as small as possible in order to make the set of indicators manageable. We propose indicators for twelve areas. We do not think that it will be possible in the foreseeable future to reduce the number of green headline indicators without excluding areas that are essential to the transition process.

- The indicators must be simple and readily comprehensible

Different users have different information needs. The public and decision-makers need concise information to be able to understand the main substance quickly. Green headline indicators are aimed towards this group.

Experts can obtain more detailed information, for example through the Swedish Environmental Protection Agency's system with around 200 green indicators.

- The indicators must be measurable and possible to follow in time series

It is important to be able to observe the indicators in time series and they should also indicate changes within a reasonably short period. It must be possible to use the indicators to analyse progress towards ecological sustainability over time.

- The indicators must be based on available data, wherever possible

Our assignment was to propose indicators on the basis of existing statistics. However, for some of the indicators we have proposed there are as yet no statistics, although they are being developed and will be available in the near future. Scientific methods must be used for the collection of data.

International comparisons

International efforts in this area have so far concentrated on devising comprehensive systems for monitoring progress towards sustainability. Sweden and a few other countries like Germany and UK are at the forefront of efforts to develop a small number of strategic ecological indicators. Recently the EU also started developing a small number of indicators, which it calls "Headline Indicators". These are comparable with our green headline indicators.

Different selection criteria are used in various national and international efforts to identify indicators that relate to the ecological dimension of sustainable development. There is no simple and universal method for selecting either a large or a small number of indicators. Usually, there is a lack of data on which to base the ideal indicator. A compromise has to be worked out from the existing data. In the long run, the international trend in this field appears to be towards indicators that allow general conclusions about the relationship between environmental impacts and human activities, e.g. the use of resources. There is also a trend towards indicators that take the form of indices, for example for biological diversity.

We have selected indicators that reflect changes in society in a broad ecological perspective, and our method is broadly consistent with the models that have been developed in other countries. It is important that green headline indicators designed to monitor the ecological transition to sustainability are presented and established as a familiar concept. Economic and social indicators are already established as measures of factors such as gross domestic product and unemployment. There is no manageable set of indicators that relates to all the three dimensions that must be reconciled if we are to attain sustainable development.

The Council's opinion is that, it may be appropriate at a later stage to review the existing indicators with a view to defining a small set of indicators that simultaneously cover all three dimensions of the sustainability concept.

The twelve green headline indicators:

Measures of underlying causes

• Use of energy

The 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 commercial premises (TWh/year)

Society's use of energy exceeds the carrying capacity of the environment and should be made as efficient as possible.

There appears to have been a gradual improvement in energy efficiency, but nonetheless total energy use has not diminished over the years. This is because we travel more, have more living space and use more electrical appliances. Electricity consumption has increased in the last decade or two.

● **Use of materials**

The indicator is measured in two ways:

- quantities of materials required in society (tonnes per person per year)
- quantity of waste to landfill sites (tonnes per year).

Materials should be used as efficiently as possible. Statistics on total material requirement are expected to 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 1997. Parliament has decided that a large proportion of the waste that is now landfilled must be reused or used for material or energy recovery. The Government has decided to prohibit the landfilling of discarded combustible waste from the year 2002 and of organic waste from the year 2005.

● **Use of chemicals**

The indicator is measured as:

- total volume of chemical products classified as harmful to health or the environment that are manufactured in and imported into Sweden (tonnes per person per year). Petroleum-based fuels are excluded from the indicator.

In 1998 about 32 million tonnes of chemical products, classified as harmful to health or the environment (not including the large quantities of fuels), came into circulation in Sweden. This is the equivalent of about 2.8 tonnes per person. The figure for 1996 was 2.7 tonnes. There was thus an increase between 1996 and 1998, which may be attributed to the economic boom during the period.

According to the guidelines issued by the Government, substances that have serious or chronic adverse effects and persistent substances that accumulate in living organisms should no longer be used in products that are released to the market.

Measures of emission levels and the state of the environment

● **Greenhouse effect**

The indicator is measured as:

- emissions of carbon dioxide (tonnes per year)

Carbon dioxide is the most important greenhouse gas by volume that is produced as a result of human activities. Emissions of carbon dioxide have almost halved since 1970, which is due mostly to more efficient use of energy, structural adjustment in industry and the development of nuclear power. However, the trend has been reversed in recent years.

The EU has undertaken to reduce emissions by 8 per cent by 2012 compared with 1990 levels.

● **Acidification**

The indicator is measured in two ways:

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

Acidifying emissions have a variety of adverse effects, in particular on forest land, lakes, streams and groundwater. They also have a damaging effect on cultural monuments and buildings.

The changes in the indicator show that emissions of sulphur dioxides dropped by over 80 per cent and emissions of nitrogen oxides by 15-25 per cent between 1985 and 1995. The previous target of an 80 per cent reduction in emissions of sulphur dioxides that was adopted by Parliament for the period 1980-2000 has been met, thanks largely to improved emission control technologies, a reduction in the sulphur content of oil and a changeover from oil to electricity. A new target has now been set, i.e. a reduction of emissions of sulphur dioxides into air by a further 25 per cent by 2010 compared with 1995 levels.

The previous target of a reduction in emissions of nitrogen oxides by 30 per cent between 1980 and 1995 was not achieved, mainly due to the increase in travel. In addition, emissions of nitrogen dioxides from offroad mobile machinery and shipping were more significant than was originally estimated. A new target has now been set, i.e. a reduction of emissions of nitrogen oxides by 40 per cent by 2005 compared with 1995 levels.

● **Eutrophication**

The indicator is measured in two ways:

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

An excess of nitrogen and phosphorus causes eutrophication of lakes and seas, which in turn affects biological diversity. This situation is caused by emissions from traffic and nutrient leakage from agriculture and wastewater.

The changes in this indicator show that discharges of phosphorus into the sea diminished at the end of the 1980s, but they have increased again slightly in recent years. Nitrogen discharges increased during the period 1991-95. The target set by the Helsinki Commission is a 50 per cent reduction in discharges into the Baltic Sea. This target has not been met, nor has the Swedish Government's target of a 40 per cent reduction, compared with 1995 levels, in nitrogen discharges into the Baltic south of the Sea of Åland.

• **Quality of urban air**

The indicator is measured as:

- the benzene level in urban air (mg per cubic metre of air as a mean level for the colder half of the year)

The quality of air in urban areas affects people's health and is harmful to flora, fauna and cultural assets. Generally speaking, air quality has improved considerably in the last decade or two, but a number of problems remain to be solved. The benzene level is a measure of the quality of the air in urban areas. Benzene is a carcinogenic substance that is formed in connection with combustion, especially of petrol. Parliament has decided that emissions of carcinogenic substances must be halved by 2005 compared with 1995 levels.

The changes in this indicator show that the benzene level in urban air diminished in the 1990s, due mostly to the lower content of benzene in petrol and the use of catalytic converters in petrol-driven cars. But the benzene level is still above the low-risk level specified by the National Institute of Environmental Medicine as a long-term mean level.

• **Biological diversity**

The indicator is measured in two ways:

- an index based on habitat variety
- the percentage of protected forests

The need to preserve and protect biological diversity is mentioned in several of the environmental quality objectives adopted by Parliament. Statistics on conditions relating to the forest objective and to some extent the agricultural landscape objective are expected to be available at the beginning of 2000. Other statistics should be available by the autumn of that year.

Protected forests included in the indicator are defined in the Environmental Code as forests in national parks, nature reserves and habitat protection areas. Protected forests in Crown reserves are also included in the indicator.

The percentage of protected forests increased between 1990 and 1996, from 2.5 to 3.7 per cent. The Government's objective is 250,000 ha of forests protected 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. In the 1999 Spring Finance Bill further resources were allocated for purchases of land. About 80 per cent of the forests that are protected today are submontane forests.

Measures of adjustment by important sectors of society

• **Environmentally sound means of transport**

The indicator is measured in two ways:

- percentage of journeys to and from work and school conveyed on foot, by bicycle or by public transport (per cent per year)
- passenger transport by car (kilometres per person per year)

Road traffic is the largest source of air pollution and noise, particularly in urban areas.

The changes in this indicator show that the percentage of environmentally sound travel to and from work remained around 20 per cent throughout the period 1978-96 and that car travel has increased in the last decade or two.

● **Environmentally sound purchasing**

The indicator is measured in two ways:

- purchases of ecolabelled products
- green public procurement

Choice of ecolabelled products is very important when it comes to increasing the proportion of environmentally sound and resource-efficient products on the market.

The changes in this indicator show that there has been a sharp increase in purchases and in the range of ecolabelled products. In 1998 Sweden's consumers bought ecolabelled products for about SEK 2,300 per person, which is almost ten times as much as in 1995, when the figure was SEK 250. (1 euro is around 8,6 SEK) The indicator is based on statistics from the ecolabel organizations SIS-miljömärkning (the Nordic Swan ecolabel and the EU flower logo), the Swedish Society for the Conservation of Nature (Good Environmental Choice) and KRAV. Between 1995 and 1998 the number of ecolabelled products on the market increased from 1,850 to about 4,050.

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

● **Recycling of nutrient**

The indicator is measured as:

- recovery of phosphorus to cultivated land

Closed nutrient cycles should be created between urban and rural areas.

The changes in this indicator show that the recovery 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. The indicator shows the amount of sludge that complies with the limit values and is recycled on arable land. In the future it may be possible with the help of new technology to extract phosphorus in other ways, in which case it will be possible to measure that too.

● **Environmentally sound work practices**

The indicator is measured in two ways:

- schools with the Green School Award
- enterprises with environmental management systems

Products affect the environment throughout their lives. Studying the number of enterprises that are awarded EMAS or ISO 14001 certificates for their environmental management systems provides a measure of industry's integration of environmental performance into its operations.

The changes in this indicator show that the number of enterprises that have introduced environmental management systems is constantly growing, although they still only represent a fraction of all enterprises.

School pupils must be taught about ecology at an early stage. 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' integration of environmental concerns into their activities. The first schools are likely to receive the award during 2000.