



Statistics Sweden

Statistiska centralbyrån

# How are the environmental accounts used in Sweden? - In a national and international perspective

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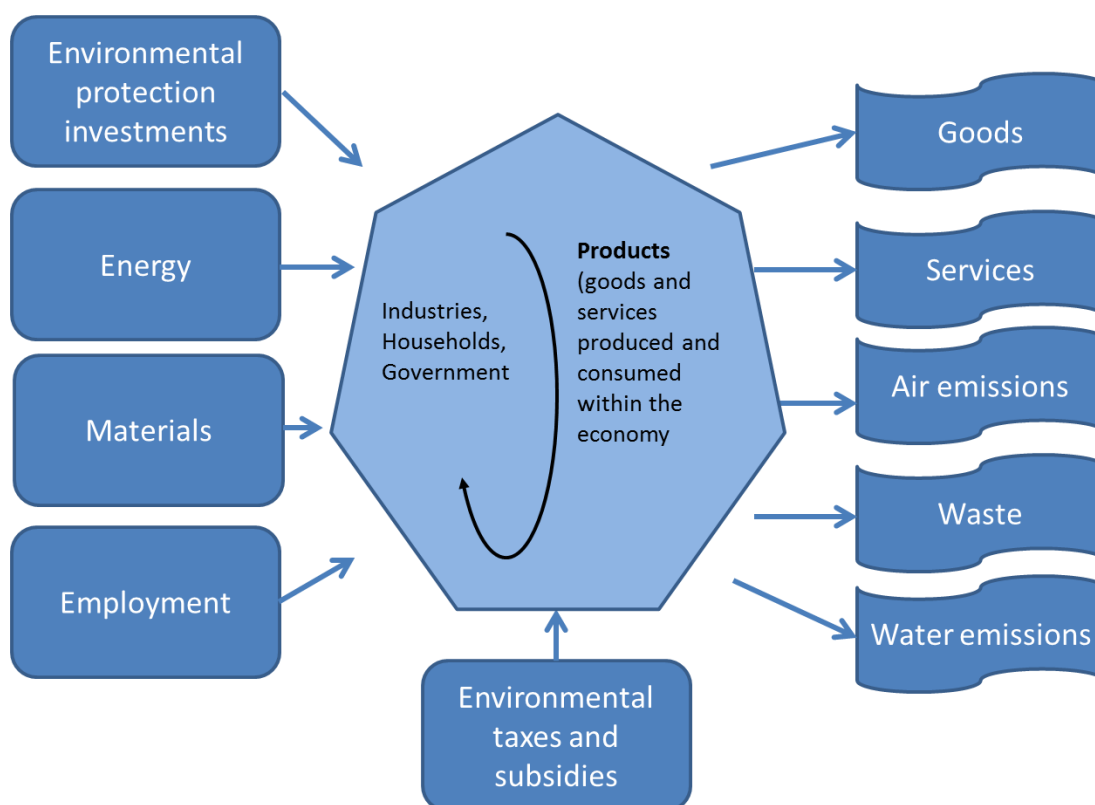


## System of Environmental and Economic accounts

The purpose of this report is to give an introduction to the system of environmental and economic accounts and describe how Sweden's environmental and economic accounts system stands internationally. It also describes how the system can be used to measure the "green economy". The report includes a discussion about the existing development areas and explains which government agencies use the information.

### Background

The components of the Environmental Economic Accounts are described in the System of Environmental Economic Accounting Central Framework (SEEA CF 2012). SEEA began development in the beginning of the 1990s. The purpose of the system is to show how the economy and the environment interact, by integrating environmental and economic accounts data. By doing so, we describe the environmental contribution to the economy (for instance, the use of raw materials, water, energy and land) and the impact of the economy on the environment (for instance, emissions to air, land and water). Please see the figure below. The environmental accounts also distinguish activities relevant to the environment in the economy (environmental goods and services sector) and economic transactions in the national accounts (environmentally related instruments and expenditure for environmental protection).



*The environmental economic accounts system is a statistical system with the aim to describe the contributions of the environment to the economy and the impact of the economy on the environment.*

## History

In 1993, Statistics Sweden, The National Institute of Economic Research and the Swedish Environmental Protection Agency were assigned to create a system to describe the relationship between the economy, the environment and natural resources, in terms of monetary and physical flows, as well as the state of the environment. This assignment was a result of the government investigation Räkna med miljön från 1991 (SOU 1991:37–38). (“Count on the environment” from 1991). While the National Institute of Economic Research was assigned to develop a "green GDP" on the macro level (an assignment which they were later released from) and to build an environmental economic model, the Swedish Environmental Protection Agency was assigned to follow the state of the environment and Statistics Sweden was to manage a statistical system for the environmental economic accounts. At the National Institute of Economic Research, the EMEC (Environmental Medium term EConomic model) was created. This was an equilibrium model that was, among other things, based on information from Statistics Sweden's environmental accounts and is still in use.

In 1997 requirements were introduced to report environmental protection costs for industry in the EU's statistics legislation. This was a part of the Structural Business Statistics (SBS) and was also introduced in the Swedish legislation from 2001. Environmental protection expenditure statistics present the costs of industry for treating and preventing emissions. These statistics are part of the environmental economic accounts.

During 2011 an EU regulation for environmental accounts was enacted and three modules were included: environmental taxes, material flows and air emissions. In 2014 this regulation was expanded to also include energy accounts, environmental goods and services sector and environmental protection expenditure accounts. The requirement implies that countries are to report annual statistics with time series from 2008<sup>1</sup>.

## Environmental Economic Accounts at Statistics Sweden today

At statistics Sweden (SCB), a team corresponding to about six persons work full-time with the different parts of the Environmental Economic Accounts. The following statistics are produced annually at Statistics Sweden on commission from the government:

### Annual statistics production

- The scope of the environmental sector (official statistics)
- Environmentally related subsidies (official statistics)
- Environmental taxes (official statistics)
- Environmental protection expenditure (official statistics)
- Air emissions by industry (official statistics)
- Energy fuel use by industry
- Material flows (official statistics)
- Chemicals indicators

### Via assignments:

- Consumption-based greenhouse emissions
- Water accounts

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<sup>1</sup>See the EU regulation 691/2011 consolidated version: <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1416221752426&uri=CELEX:02011R0691-20140616>

- Ecosystem accounts
- Environmental technology
- Forest accounts
- Land accounts

## International work

The environmental economic accounts exist by and large in all countries in the EU as well as several other countries outside the EU such as Canada, the US, Norway, Brazil, New Zealand, Japan and India (Eurostat, 2007). An evaluation was done by the UN during 2014 on the countries who work with the environmental accounts today: *Global Assessment of Environmental-Economic Accounting and Supporting Statistics 2014*. You can read it here: [http://unstats.un.org/unsd/envaccounting/ceea/meetings/tenth\\_meeting/BK9e.pdf](http://unstats.un.org/unsd/envaccounting/ceea/meetings/tenth_meeting/BK9e.pdf)

In the EU, work on environmental economic accounts is handled from Eurostat and there is a comprehensive strategy that extends from 2014 to 2018<sup>2</sup>.

Sweden's environmental economic accounts stand out internationally by including the use of chemicals in the system and through the analysis of emissions for consumption in other countries. In addition, Sweden is in the forefront, along with the Netherlands, in terms of environmental goods and services sector and environmental subsidies. Sweden belongs to task force groups at Eurostat that work for internationally harmonised statistics.

Further, Sweden is a member in the London group<sup>3</sup> a UN based "city group" with experts in the field of environmental accounts. The purpose of the London Group is to:

- Harmonise environmental economic accounts and related statistics
- Raise the SEEA to an international statistical standard
- To speed up the implementation of SEEA in more countries

In addition, Statistics Sweden is a member of the UN committee for experts in environmental accounts (United Nations Committee of Experts on Environmental-Economic Accounts). This committee meets once a year and its purpose is to help with the strategic work for implementing the environmental accounts needed by the UN.

Statistics Sweden takes part through their work with the International Consulting Office to build up different statistical areas in developing countries. This work is financed by Sida and environmental statistics is a priority area.

## Development areas in the Environmental Economic Accounts

Many areas are desirable to develop within the area of Environmental Economic Accounts in Sweden. We have chosen to divide them into three different categories: areas that are planned for and financed within the frame of our existing assignment, areas that are frequently requested nationally as well as internationally but have no financing, and areas that are current with regard to the new sustainability goals within the UN.

<sup>2</sup> <http://ec.europa.eu/eurostat/documents/1798247/6079569/ESSC-2014-21-EN-24-EuropeanStrategy-env.pdf>

<sup>3</sup> <http://unstats.un.org/unsd/envaccounting/londongroup/>

Planned development within the frame:

- Quarterly statistics for air emissions by industry (based on quarterly energy calculations)
- Regional data on air emissions by industry
- Develop environmentally related subsidies (more specifically, potentially environmentally hazardous subsidies and statistics broken down by industry)
- National energy accounts

In demand but not financed:

- Environmental impact of consumption
- Use of land and biodiversity
- Ecosystem services and Marine and water related environmental economy

Related to the UN goals for sustainable development

- Include social issues in the environmental accounts system to obtain a complete accounting system for sustainable development.

There are several examples of how to include the social aspects in the environmental accounts system. These have also been discussed in the London Group, for example at the meeting in Copenhagen in 2004, as well as in the UN communication strategy for environmental accounts and in the coming report (2015) to the Nordic Council of Ministers that Statistics Sweden is leading. There are three approaches to do this:

1. Socio-economic aspects. Analyse in more detail the parts that are in general included: employees, household types, education, sex, income etc.
2. Socio-environmental aspects. Integrate closely related social issues with the economy and the environment: poor health caused by emissions, working environment, traffic accidents, access to nature, exposure to radon, passive smoking etc.
3. Other social aspects. Social issues, crucial for sustainable development, generally for society known as social capital. These can include data with a looser connection to the economy, such as poverty, health, threats of violence, unemployment, political influence. If the external effects of consumption are included, obesity and drug abuse could also be taken up.

So far the environmental economic accounts system has been used mainly by government organisations such as ministries, by The Swedish Environmental Protection Agency, the National Institute of Economic Research and Eurostat. It is also an important data source for researchers for example when it comes to air emissions and in connection to our economy. If the environmental economic accounts system is to be used in a broader context, for example to illustrate social development or marine issues, new cooperation projects need to be initiated. This is fully possible but requires financing during a longer period. This financing is not available at Statistics Sweden today.

The group for the environmental economic accounts sees a tremendous driving force for the demand in the international management. Driving forces for increased information needs exist e.g. in the EU strategy for a resource-efficient Europe. These needs include information on material flows and for ecosystems as well as for land use linked to economic actors and economic instruments.

After the UN's acceptance of the new goals for sustainable development we can now see that the environmental accounts are frequently requested as a basis for the proposed indicators for

sustainable development. We have also experienced a strong driving force for analyses of the environmental impact of consumption nationally. In no other country do we find such great interest about this issue as we find in Sweden. From OECD and from researchers the demand for this type of analyses has also been evident for a long time. Eurostat has noted the interest for analysis on the environmental impact of consumption and has done so for many years. Now that the EU's strategy for environmental economic accounts require yearly reporting of air emissions by industry, the quality of the analyses will increase, as the environmental data availability for many important trading partners will then be available .

## Clients

The group for the environmental accounts receives enquiries for assignments annually. About a third of the time that the group has available can be reserved to make additional analyses and answer statistical enquiries.

Approximately 18 assignments on average per year are handled by the environmental accounts group; their clients are national as well as international organisations. The main assignments are from the public sector in Sweden and international organisations. Assignments from private enterprises are not common.

During 2014 the largest national clients were the Swedish Environmental Protection Agency, the Swedish Energy Agency, the Swedish National Board of Housing, Building and Planning and the Government Offices (Ministry of Enterprise and Innovation, and Ministry of the Environment and Energy).

The Swedish Environmental Protection Agency gave an assignment to the environmental accounts at Statistics Sweden in 2014 to deliver data and analyses in the area for climate impact of consumption<sup>4</sup>. It has also given statistics Sweden the main responsibility for the research assignment called Policy Relevant Indicators for Consumption and Environment (PRINCE). PRINCE is a three year assignment that started in 2014 and is done in cooperation with the Royal Institute of Technology (KTH), the Stockholm Environment Institute, Chalmers University of Technology, the Norwegian University of Science and Technology and TNO/CML of the Netherlands. In previous years the environmental economic accounts have contributed to the follow-up of the environmental goals in areas like chemicals and environmental – economic instruments.

The Swedish National board of Housing, Building And Planning together with KTH has assigned the environmental accounts to develop environmentally relevant indicators for buildings and factory premises. This resulted in several publications at the Swedish National Board of Housing, Building and Planning in 2014: *Miljöpåverkan från bygg- och fastighetsbranschen 2014*<sup>5</sup> (Environmental impact from the construction and real estate industry 2014)

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<sup>4</sup> Results are published (in Swedish): <http://www.naturvardsverket.se/Sa-mar-miljon/Statistik-A-O/Vaxthusgaser-utslapp-per-konsumtionsomrade-Sverige/> and <http://www.naturvardsverket.se/Sa-mar-miljon/Statistik-A-O/Vaxthusgaser--utslapp-av-svensk-konsumtion/>

<sup>5</sup> <http://www.boverket.se/globalassets/publikationer/dokument/2014/miljopaverkan--bygg-och-fastighetsbranschen-2014.pdf>

The Government Offices have had two areas of interest during 2014: Ministry of Enterprise and Innovation with environmental technology and Ministry of the Environment and Energy within ecosystem services.

In both cases the environmental accounts tested and produced new statistical methods to produce new statistics and new analyses within these areas. Both assignments resulted in publications that are available on statistics Sweden's website: MIR 2015:6 Creating statistics about environmental technology (clean tech) and MIR 2015:02 Land accounts for biodiversity – a methodological study.

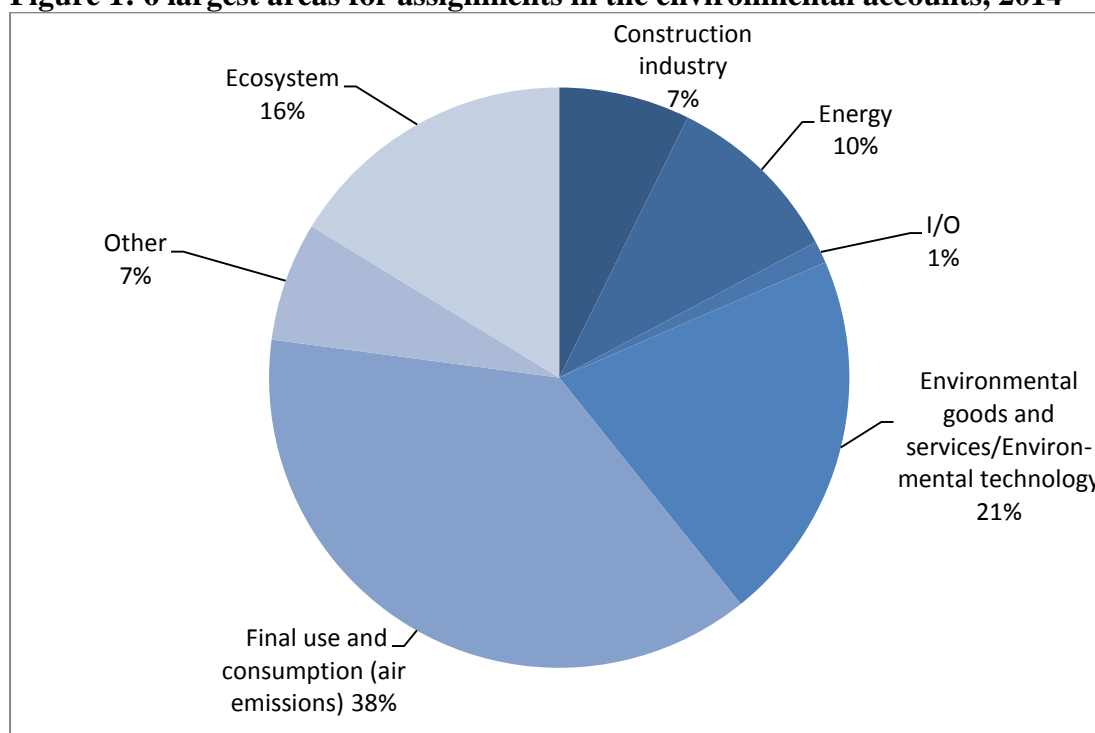
Among others, the international clients are the EU (both Eurostat and the rest of the Commission), the European environmental office, Nordic Council of Ministers and other private consultants in Europe.

Through research, Eurostat has been able to contribute to national development of statistics and also for environmental economic accounts. For several years statistics Sweden has been making national studies within various areas such as air and energy accounts and the development of environmental economic accounts on behalf of Eurostat. These studies are later used to help other countries to further develop the statistics and provide Eurostat with examples of possibilities for analysis.

The Nordic Council of Ministers assigned Statistics Sweden and the Ministry of the Environment and Energy in cooperation with their Nordic counterparts to develop indicators for supplementing welfare measures beginning with the environmental area. The result of the work of this ad hoc group will be made public during autumn of 2015 in Reykjavík during the meeting of the Nordic Council of Ministers.

Other private consultants that the environmental accounts have worked together with are: Sogeti (Luxembourg), ICEDD (Belgium), IEEP (UK) and SERI (Austria), Wuppertal Institute and University of Twente (Netherlands). In these cases, the work has mostly focused on assignments to Eurostat, DG Environment, DG Clima and the EEA. Areas for further development have been water-air energy and material flow accounts, as well as new development of statistics for climate adaptation costs at the EU level and the development of presentation techniques of the climate impact of consumption via the web.

**Figure 1: 6 largest areas for assignments in the environmental accounts, 2014**



Note: I/O stands for input-output related assignments regarding employment and value added

During 2015 the great interest for the environmental impact of consumption has continued. The Swedish Energy Agency has shown interest to expand analyses abroad for Sweden's environmental impact of consumption related to energy. In addition, Statistics Sweden will work together with UNEP to develop indicators within the frame for the UN's sustainability goals, a sub-area for sustainable patterns of consumption and production, with indicators taken from the environmental economic accounts.



## **Publications of the environmental accounts**

### **Links to our published statistics**

The statistics are published once a year at Statistics Sweden in the statistical database and as tables on the product side.

#### *Statistical database:*

<http://www.statistikdatabasen.scb.se/pxweb/en/>

#### *Environmental accounts product page:*

<http://www.scb.se/en/Finding-statistics/Statistics-by-subject-area/Environment/Environmental-accounts-and-sustainable-development/System-of-Environmental-and-Economic-Accounts/>

### **Links to publications**

The environmental accounts publications are presented below. You can find them on the Statistics Sweden website, <http://www.scb.se/en/> Some reports are linked to Eurostat.

#### **What are the environmental accounts?**

[MIR2002:3 Content, use and users \(In Swedish\)](#)

[Uses of Environmental Accounts in Sweden \(In English\)](#)

#### **Air and energy accounts**

[Carbon dioxide emissions from Swedish final consumption 1995-2009 \(In English\)](#)

[Methodology on emissions to air within environmental accounts in Sweden \(In Swedish with parts in English\)](#)

[Energy use and CO<sub>2</sub>-emissions for consumed products and services. IPP-indicators for private and public consumption based on environmental accounts \(In English\)](#)

[Documentation of fuel calculations of Environmental Accounts \(In Swedish\)](#)

[Regional areas of mobile emissions in the mileage database \(In Swedish\)](#)

[MIR2004:2 Valuing morbidity effects of air pollution in Sweden \(In Swedish\)](#)

[Breakdown of emissions from mobile sources by industry \(In Swedish\)](#)

[Structural decomposition of environmental accounts data - the Swedish case \(In English\)](#)

[Households in the environmental accounts \(In English\)](#)

[Economy, energy, environment - methods to analyse the connection \(In Swedish\)](#)

[MIR2002:2 Environmental Impact of Swedish Trade \(In Swedish with parts in English\)](#)

[MIR2002:1 Economic effects of restrictions on carbon dioxide emissions \(In Swedish\)](#)

[The environmental impact of different commodity groups \(In Swedish\)](#)

[MIR2000:5 The Environmental impact of Swedish trade -results from a pilot studie \(In Swedish\)](#)

[MIR1999:1 Reduced emissions of carbondioxide through changed use of materials - a pilot study \(In Swedish\)](#)

[The Environmental impact of Swedish Trade \(In English\)](#)

[Increasing the timeliness of environmental accounts carbon dioxide emissions data \(In English\)](#)

[Energy accounting and the NAMEA \(In English\)](#)

[Environmental accounts Households \(In English\)](#)

[Disaggregation and improvement of the Swedish NAMEA \(In English\)](#)

### **Water accounts**

[The economic structures and environmental pressure in the Swedish river basin districts 1995-2011 \(In Swedish with parts in English\)](#)

[MIR2007:1 The economic structures and environmental pressures in the Swedish river basins 1995-2005 \(In Swedish with parts in English\)](#)

[Supplementary statistics for reporting according to the frame directive for water \(In Swedish\)](#)

[Costs and income for production and distribution of water and treatment of sewage for municipalities and municipal companies - by water district \(In Swedish\)](#)

[Environmental and economic profiles and forecasts for water districts - economic analyses according to the frame directive for water \(In Swedish\)](#)

[Forecast of water extraction and water use 2015 - presented by water district \(In Swedish\)](#)

[MIR2003:2 Water accounts 2000 - with disaggregation to Sea basins \(In English\)](#)

### **Material flows**

[The Commodity Guide and its use in the work towards Non-toxic and Resource-saving cyclical systems \(In Swedish with parts in English\)](#)

[Accounting for Flows of Fruit and Vegetables in the Food chain - method development based on MFA \(In Swedish with parts in English\)](#)

[Material Flow Accounts - Statistics and Development \(In Swedish with parts in English\)](#)

[Pharmaceuticals, cosmetic and hygienic products in Sweden \(In Swedish\)](#)

[Combination of codes in the Combined Nomenclature for Swedish Material Flow Accounts - Method Development \(In English\)](#)

[Consumer goods and goods especially intended for children \(In Swedish with parts in English\)](#)

[Material Flows in Sweden 1998-2005 \(In English\)](#)

[Material Flow Accounts and Policy. Data for Sweden 2004 \(In English\)](#)

[MIR2000:4 Towards a national material flow statistics \(In Swedish\)](#)

[Direct Material Inputs \(DMI\) and Domestic Material Consumption \(DMC\) for Sweden 1987 - 1997 \(In English\)](#)

[Material flow study of sand and gravel in Sweden \(In English\)](#)

## **Chemicals**

[MIR2010:1 Domestic Inflow of Hazardous Substances \(In English\)](#)

[Chemicals in Statistics - Method Development \(In English\)](#)

[Chemical product indicators by industry - fossil fuels, cement and other chemical products classified as hazardous to health or environment, 1996-2001 \(In English\)](#)

[Chemical product and substance indicators in the SMEA - health and environment \(In English\)](#)

[The magnitude of chemical products use in different industries \(In English\)](#)

## **Waste**

[Summary of hazardous and non-hazardous wastes in environmental accounts, by industry \(In Swedish with parts in English\)](#)

[The recycling industry in Sweden 1995 \(In English\)](#)

## **Environment-related economic instruments**

[MIR2010:2 Environmentally related taxes, subsidies and emission permits \(In Swedish\)](#)

[MIR2008:1 Environmental economic indicators in the Swedish state budget 1995-2006 \(In English\)](#)

[MIR2000:3 Environmental taxes and environmentally damaging subsidies \(In English\)](#)

[MIR2007:2 Environmental economic indicators in the Swedish state budget 1995-2006 \(In Swedish with parts in English\)](#)

[MIR2005:21 Administrative policy tools - way to implement them in the environmental accounts \(In Swedish with parts in English\)](#)

[Analysis of the Introduction of Emission Allowance Trading Schemes in Sweden \(In English\)](#)

[MIR2003:4 Environmental subsidies - a review of subsidies in Sweden between 1993 and 2000 \(In English\)](#)

[MIR2003:1 Economic effects for Sweden of Limited Carbon Dioxide Emission Trade within EU \(In Swedish\)](#)

[Energy taxes in the Nordic countries \(In English\)](#)

[Environmental taxes and environmentally damaging subsidies \(In Swedish\)](#)

[Public environmental protection expenditures and subsidies in Sweden \(In English\)](#)

[Swedish Environmental Accounts Integration \(In English\)](#)

### **Climate adaptation expenditure**

[Climate change adaptation expenditure - A proposal for a methodology to compile, define and classify national and EU economic information as statistics \(In Swedish with parts in English\)](#)

### **Environmental protection expenditure**

[Environmental Protection Expenditure – new data collection and additional information \(In English\)](#)

[Environmental Protection Expenditure Accounts in Sweden – a pilot application and analysis \(In English\)](#)

[Public environmental protection expenditures and subsidies in Sweden \(In English\)](#)

[Refined Environmental protection expenditures in Sweden \(In English\)](#)

[MIR2000:2 Environmental protection expenditure in industry 1997 - results from a Swedish pilot study \(In English\)](#)

[Environmental protection expenditure in industry - What, why and how? \(In Swedish\)](#)

[Adaption of Swedish data on Environmental protection in the public sector to the SERIEE-system \(In English\)](#)

[Testing SERIEE's Environmental protection expenditure account in Sweden \(In English\)](#)

### **The environmental sector**

[MIR 2015:6 Creating statistics on environmental technology \(clean tech\) \(In Swedish\)](#)

[Environmental Goods and Services sector in Sweden - Suppliers \(In English\)](#)

[The size of environmental sector - methodology and sources \(In Swedish with parts in English\)](#)

[Environmental goods and services sector in Sweden 2002-2005 \(In English\)](#)

[MIR2005:2 The environment industry in Sweden 2003 \(In Swedish\)](#)

[The Environment industry in Sweden 1999 \(In English\)](#)

[MIR2000:8 The environment industry in Sweden 2000 \(In English\)](#)

[MIR2000:1 The environment industry in Sweden 1999 \(In English\)](#)

[MIR 1999:2 The Environment industry and employment in Sweden \(In Swedish\)](#)

[Producers of Environmental services \(In English\)](#)

### **Ecosystem accounts and biodiversity**

[Land accounts for biodiversity - a methodological study \(In Swedish with parts in English\)](#)

[Inventory of data source for quantification of ecosystem services \(In English\)](#)

[Inventory of data sources for quantification of ecosystem services \(In Swedish with parts in English\)](#)

[MIR2009:1 Biodiversity - Maps and statistics \(In Swedish with parts in English\)](#)

[Nordic Natural Resource and Environmental Accounting \(In English\)](#)

### **Land accounts**

[Land use by industry 2000 \(In English\)](#)

[Land accounting for Sweden \(In English\)](#)

### **Forest accounts**

[Environmental accounts for forest \(In English\)](#)

[MIR1999:3 Forest accounts - physical data \(In Swedish\)](#)

[Forest economic Environmental accounting: a pilot study of a first implementation \(In English\)](#)

### **Sustainable development**

[Environmental indicators for changeover and resourcefulness of the environmental objectives \(In Swedish with parts in English\)](#)

[Sustainable development indicators based on environmental accounts \(In English\)](#)

[Social namea with a coupling to Sustainable Development Indicators - including environmental industry \(In English\)](#)

[MIR2004:1 Social statistics by industry \(In English\)](#)

[MIR2003:3 Sustainable Development Indicators based on environmental economic and social statistics \(In Swedish with parts in English\)](#)

[Sustainable development indicators for Sweden \(In English\)](#)

[MIR2000:7 Method for Socio-economic analyses of environmental measures \(In Swedish\)](#)

### **Regional environmental accounts**

[Regional environmental accounts 1993-1997 \(In Swedish\)](#)

[Regional Environmental accounts for the greater Stockholm region-a first step \(In English\)](#)

### **Other publications**

[Web-tool part 2 \(In English\)](#)

[SEEA on Wikipedia \(In English\)](#)

[A European web tool for environmental accounts data – a pilot application \(In English\)](#)

[Environmental and economic key figures for industries within the manufacturing industry \(In Swedish\)](#)

[Environmental accounting 1993-1998 \(In Swedish with parts in English\)](#)

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