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The Environment Industry in Sweden, 1999

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The views expressed in this document are the authors' and do not necessarily reflect the opinion of the European Commission

Preface

As part of work to develop environmental accounting and environmental statistics, Eurostat is currently looking at measuring environmental employment. The basic framework for the work was developed by Eurostat together with OECD's Directorate for Science, Technology and Industry and published as OECD/Eurostat 1999: The Environmental Goods and Services Industry – Manual for Data Collection and Analysis. Copies of this manual (in English or French) can be obtained from OECD sales points or from the OECD on-line book-shop at <http://www.oecd.org/bookshop/>.

This Working Paper presents the results of work on measuring the environment industry and environment-related employment by Statistics Sweden and is the third of a series of 4 Eurostat Working Papers released in 2000 presenting the outcomes of pilot exercises undertaken by Dutch, Portuguese, Swedish and French statistical agencies in 1999.

The pilot exercises benefited from financial support provided by the European Commission's Directorate General for the Environment.

The reports on the pilot exercises provide useful and recent information on environmental employment, thus directly responding to political demand for better information on employment opportunities generated by environmental protection.

The reports also describe the methods developed for estimating environmental employment based on existing statistics and other information and provide indications for improvement of the primary statistics needed for measuring environmental employment.

Whereas each of the pilot exercises used a specific approach, all pilot exercises taken together offer a very comprehensive and helpful exploration of statistical approaches towards measuring environmental employment. It is thus recommended to consult all pilot applications together with the OECD/Eurostat environment industry manual when designing systems to measure environmental employment based on existing information.

In this Working Paper the approach by Statistics Sweden is presented. The method used is based on setting up a very comprehensive database of enterprises and establishments involved in environment industry activities which is linked to the Business register, the VAT Register and a database on employees (including data on education level). Results include turnover, exports and employment of enterprises and establishments involved in environment industry activity. Employment is also presented by level of education and in a regional breakdown.

Eurostat distributes this report hoping that others wishing to undertake estimates of environmental employment can benefit from the Swedish experience.

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Preface

Statistics Sweden has developed physical environmental accounts since 1993. To begin with, the focus has been on developing the environmental accounts for energy and certain emissions. This is the second report of results of developmental work on incorporating descriptions of the environment industry into the Swedish environmental accounts.

The previous report included an estimation of the total environment industry in terms of employment and turnover mainly focusing on the core environment industry. The report also made first attempts to compile a list of environment enterprises outside the core environment industry.

This second report is based on the work described in the previous report. The continuation, however, is more emphasising on improving the Environment Industry database and identifying more enterprises and establishments outside the core environment industry. The result is a more close and correct Environment Industry database, with possibilities to analyse the environment industry according to environment classes under the definition.

The report is prepared on commission from EUROSTAT, who supports and co-ordinates development of environmental statistics in the EU member states. The European Commission (DG Environment) has contributed financially to the project. Lena Tängdén and Peter Svensson have contributed in preparing this report.

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1 Summary

The interest in the environment industry has grown over the last few years and the relationship between environment, industry and employment is often the focus of attention. There is however, partly a lack of information and this made it important to produce basic figures about the environment industry.

Statistics Sweden began examining the environment industry in Sweden in 1998 and the first work, done with financial assistance from the European Commission's Directorate General for Regional Policy, was published as a EUROSTAT Working Paper in early 1999. The present report was made with contribution from the European Commission's Directorate General for Environment and continues the previous work.

The work can be described in five steps:

1. Identifying names of enterprises/establishments with business activity under the OECD/EUROSTAT definition of the environment industry.

Sources in previous work: Internet searches, Telephone directory, The Swedish business register; key words and core industries¹, the Swedish EnviroNet, The EU-report², Manufacturing statistics and Energy statistics.

Sources added in this study: Databases (Business calendar, Företagsfakta, PAR/Bizbook), Business organisations (KRAV, Demeter, The Swedish Windpower Organisation, Solar Energy Association of Sweden, Eco-Tourism), enterprises participating on the Swedish fair for environment technology (Eco-Tec 99), Statistics Sweden's Survey of waste management, advertisements and articles in press and television.

2. Classifying the identified enterprises/establishments by environment industry classes and status (i.e. degree of specialisation in environmental activities).

3. Matching the list of identified enterprises/establishments with the Swedish Business Register in order to get the enterprise/establishment numbers.

4. The result is a database with two parts, one for enterprises and one for establishments.

The two parts of the database are basically compatible, but differ to some extent due to the fact that some of the enterprises have establishments dealing in different business activities. An important example are municipalities (they are treated in the same way as enterprises) that can have establishments involved in very different activities such as schools or nursing (not included under environment industry) as well as wastewater treatment which is included. In these cases the enterprises were not included so that the establishment part of the database is more comprehensive than the enterprise part.

¹ The core industries are considered to contain 100% environmental industry, mainly waste and wastewater treatment and recycling (NACE codes 25.12, 37, 51.57 and 90).

² Ecotec, BIPE and IFO (1996). The Swedish Eco-Industry: Country Summary

5. Linking the enterprise/establishment numbers with other registers – the Register for value added tax (VAT) in order to produce data about turnover and export- import figures and a database with data about education of the employees (LOUISE-database).

Besides linking register data in order to describe and analyse the different classes/environment activities, the Environment Industry database can also be used as a sample frame in future surveys.

The results in brief:

- 8 330 enterprises were identified and found in the Swedish Business Register. 6 727 of these were active enterprises (i.e. they do not have any closure date)
- In terms of status of specialisation over 60 per cent of the identified enterprises and establishments were classified as primary environmental industry. The other were classified as either secondary, producing multi-purpose products or not finally defined.
- 4 462 of the 6 727 enterprises were found in the VAT register. Total turnover, export and import were collected for the enterprises in the VAT register.
- Total turnover for the identified enterprises in the VAT Register was SEK 163 billion (1998). This was four per cent of the total turnover in the VAT Register.
- Total exports were nearly SEK 28 billion. SEK 14,4 billion were exports to the EU, and the remainder exports to countries outside the EU (1998).
- The import from EU countries to the identified enterprises was a bit over 7 billion SEK in 1998. The identified enterprises are thus net exporters.
- 10 571 establishments were identified and found in the Swedish Business Register. Data about number of employees, geographical spreading and level of education were produced on establishment level.
- Nearly 95 000 persons were employed by environment industry establishments.

2 Introduction and background

The interest in the Environment Industry has grown the last few years and the relationship between environment, industry and employment is often the focus of attention. Hopes are that the development of the environment industry will make it possible both to reduce environmental pressures and to increase employment and export at the same time.

In Sweden, implementation of the government policy of building a sustainable society has resulted in action plans involving all policy fields. There are also policies explicitly directed at the environment sector such as government grants for the creation of green jobs³, suggestions of supporting the internationalisation of the environment driven enterprises⁴ and rather newly established authorities such as, for instance, the Swedish Delegation for Sustainable Technology.

EUROSTAT and OECD have developed harmonised definitions and an analytical framework for the environment industry (see OECD/EUROSTAT 1999). Several countries are now working or have already completed pilot work in the area. Sweden is one of these countries, working with the OECD/EUROSTAT definition as basis.

The first pilot work "The Environment Industry in Sweden" was finished at the end of 1998 and was mainly concentrated on investigating the core industries⁵, but also made a first attempt to cover non-core industries. This report summarises the continuation of this line of work.

In the previous report, the theoretical framework on definitions and classifications done by OECD/EUROSTAT was examined. For more details, the previous report is recommended.

The general definition given by OECD/EUROSTAT is as follows:

*"The environmental goods and services industry consists of activities which produce goods and services to measure, prevent, limit, minimise or correct environmental damage to water, air, and soil as well as problems related to waste, noise and eco-systems. This includes cleaner technologies, products and services which reduce environmental risk and minimise pollution and resource use."*⁶

Like in the previous study, this study contains both enterprises and establishments. The reason for using both enterprises and establishments are the possibilities to produce data. Since establishment is a smaller and therefore more specific unit than enterprise, establishment is used where possible. Data about employees and geographical location can be described for establishments. Economical data, such as turnover, export and import are only available for enterprises.

This report is a continuation of the report published in early 1999⁷. Below follows a short summary of the previous report.

³ Ministry of the Environment (1998).

⁴ Ministry of Industry and Trade (1998).

⁵ The core industries are considered to contain 100 % environmental industry, mainly waste and wastewater treatment and recycling. The core industries are NACE code headings 25.12, 37, 51.57, and 90. Where possible we use an even more detailed level of these headings which is the Swedish SNI-code. The SNI-code is the same as NACE, but with a last digit added.

⁶ OECD/EUROSTAT (1999). The environmental goods & services industry, page 9.

⁷ EUROSTAT Working Paper 2/1999/B/3 (1999). The Environmental Industry in Sweden

In the previous report a first attempt was made to estimate the size of the environment industry, both inside and outside the core industries. The result was a list compiled from the core industries and a selection of enterprises in the Business Register with "environment" or "ecology" in the enterprise name, environmental headings in the telephone directory, searches on the Internet, list of environmental consultants⁸, enterprises in the EU report⁹, enterprises with product codes considered to be 100 per cent environmental¹⁰ and energy producers using more than 50 per cent renewable energy according to the energy statistics.

The work has now continued with this first list of enterprises/establishments as a basis.

2.1 Results from the previous report

The previous report estimated that employment in enterprises of the core industries was over 9 000 employees, but if all establishments in the core industries were included the number of employees was 13 500 (according to the Swedish Business Register). The number of employees in industries outside the core industries was nearly 30 000. The largest shares were found in Electricity, gas and water supply (NACE 40). Many of the employees were also found in enterprises producing environment consultancy services, environmental testing and analysis, industrial cleaning and equipment for wastewater treatment and waste treatment. The environmental industry engaged nearly 39 000 employees in total, or one per cent of the Swedish labour force, distributed over nearly 3 500 enterprises.

In the core industries, about 60 percent of the employees worked in the private sector and the level of education was rather low. The share of employees with a maximum of 9-year compulsory school was 43 percent in the core industries and only 5 percent had University (tertiary) education.

The turnover for the total environment industry (based on enterprises) was about 90 billion SEK in 1997 of which the turnover in the core industries was about 16 billion SEK.

Estimation of total environmental industry, core industries and other industries 1997

NACE	Enterprises in the Business register	Enterprises in the VAT register	Number of employees in the Business register 1996	Share of employees at environmental establishments, %	Total turnover from the VAT register, Million SEK
Core industries	1 910	1 494	9 228	100	16 203
Non core industries					
21	7	10	3 330	7	5 991
26	10	11	1 214	7	2 198
29	43	52	3 943	4	7 195
40	31	37	6 363	25	41 711
74	547	549	4 928	2	4 351
80	15	16	4 058	3	1 372
Other NACE	919	904	5 605	0-2	10 657
Total excl. core industries	1 572	1 579	29 441	1	73 476
Total incl. core industries	3 482	3 073	38 669	1	89 679

Source: EUROSTAT Working Paper 2/1999/B/3 (1999). The Environmental Industry in Sweden

⁸ The Swedish Environmental Protection Agency (1998).

⁹ Ecotec, BIPE and IFO (1996). The Swedish Eco-Industry: Country Summary

¹⁰ EUROSTAT Working Paper 2/1999/B/3 (1999). The Environmental Industry in Sweden

2.2 Objectives

The objective of this report is to continue and improve the work described above and make a database of enterprises and establishments that falls under the OECD/EUROSTAT definition of the environment industry. This means identifying more environment producers; enterprises and establishments in order to better cover the environment industry. The enterprises are also classified according to environment industry classes (according to the OECD/EUROSTAT manual¹¹).

The previous report was a good basis for this report whose purpose is to produce a more regular data production system on the environment industry where all the identified enterprises are classified according to NACE, environment industry classes and status of specialisation.

The Environment Industry Database opens up many possibilities. The main objective of this study is to produce data and describe the environment industry according to number of enterprises and establishments, turnover, export and import and employees, all classified by NACE code and by environment industry class. The objective is also to make first attempts of data production about the level and kind of education for the whole environment industry, including establishments outside the core industries.

¹¹ OECD/EUROSTAT (1999). The environmental goods & services industry.

3 Method and sources

In this chapter the method and sources used in this report are described in detail. The procedure is summarised below:

1. Identifying names of enterprises/establishments with business activity under the OECD/EUROSTAT definition of the environment industry.

Sources in former work: Internet searches, Telephone directory, The Swedish business register; key words and core industries, the Swedish EnviroNet, The EU-report, Manufacturing statistics and energy statistics.

Sources added in this study: Databases (Business calendar, Företagsfakta, PAR/Bizbook), Business organisations (KRAV, Demeter, The Swedish Windpower Organization, Solar Energy Association of Sweden, ECO-Tourism), enterprises participating on the Swedish fair for environment technology (Eco-Tec 99), Statistics Sweden's Survey of waste management, advertisements and articles in press and television.

2. Classifying the identified enterprises/establishments by environment industry classes and status (i.e. degree of specialisation in environmental activities).

3. Matching the list of identified enterprises/establishments with the Swedish Business Register in order to get the enterprise/establishment numbers.

4. The result is a database with two parts, one for enterprises and one for establishments.

The two parts of the database are basically compatible, but differ to some extent due to the fact that some of the enterprises have establishments dealing in different business activities. An important example are municipalities (they are treated in the same way as enterprises) that can have establishments involved in very different activities such as schools or nursing (not included under environment industry) as well as wastewater treatment which is included. In these cases the enterprises were not included so that the establishment part of the database is more comprehensive than the enterprise part.

5. Linking the enterprise/establishment numbers with other registers – the Register for value added tax (VAT) in order to produce data about turnover and export- import figures and a database with data about education of the employees (LOUISE-database).

Besides linking register data in order to describe and analyse the different classes/environment activities, the Environment Industry database can also be used as a sample frame in future surveys.

3.1 Results of identifying enterprises and establishments in the environment industry

Using the different sources described below, a list with a total of 8 330 enterprises or establishments was established. From these, 6 727 enterprises were found as active enterprises in the Swedish Business Register and 1 219 were found as establishments. The

degree of identification differed between the sources and many enterprises/establishments were found in more than one source.

Source	Initial list	Identified in Swedish Business Register	Identification degree between initial list and Swedish Business Register	Identified enterprises in per cent of total identified enterprises
Other sources (1910 from the last report and 82 new)	1992	1784	90	21
Telephone directory	950	768	81	9
Business Calendar	270	179	66	2
"FöretagsFakta"	2259	1445	64	17
PAR	2019	1356	67	16
Bizbook	1038	943	91	11
The Swedish EnviroNet	255	160	63	2
Eco-Tech exhibition 99	224	148	66	2
Survey of waste management (Statistics Sweden)	477	383	80	5
Ecotourism	10	6	60	0
SEAS	71	57	80	1
KRAV	2881	1045	36	13
DEMETER	131	43	33	1

3.2 Earlier work: "The Environment Industry in Sweden"

The work of collecting enterprises to create the database for environment industry was based on the previous report Statistics Sweden did in this area, namely The Environment Industry in Sweden¹². In that study, six different sources were used for identification and description of the core industry and other identified environmental enterprises.

The main sources were:

- The Statistics Sweden Business Register, through the key words "eco" and "environment"
- The Swedish EnviroNet
- The EU-report¹³
- Manufacturing statistics¹⁴
- The Telephone directory
- Energy statistics

A total of 1 910 enterprises in the core industries and 1 572 other environment enterprises were identified and listed in that study. This was the base which has been extended and improved in this project.

3.3 The Internet databases "Business calendar" and "Företagsfakta"

One way of identifying enterprises outside the core industries was by using these two databases available at the Internet. They have been used to identify enterprises by using keywords connected to the description of the activity of each enterprise given in the database. The description of the activity has also been used to classify the enterprises

¹² EUROSTAT Working Paper 2/1999/B/3 (1999). The Environmental Industry in Sweden

¹³ Ecotec, BIPE and IFO (1996). The Swedish Eco-Industry: Country Summary

¹⁴ EUROSTAT Working Paper 2/1999/B/3 (1999). The Environmental Industry in Sweden

according to status of specialisation and environmental industry class. This has been done not only for the enterprises identified in this study, but also for the enterprises which were identified in the previous study.

Both databases are maintained by companies dealing in selling addresses, mainly for commercial purpose. The databases include some basic data about the enterprise and, important for this line of work, a description of their business activity. Sometimes this description includes which labels and brands they deal with, more often it is a description of the services they can supply, all depending of what the enterprise itself has chosen to emphasise on.

The Business calendar contains about 30 000 enterprises and Företagsfakta contains about 180 000 enterprises. This can be compared with The Swedish Business Register, maintained by Statistics Sweden, which contains data about all registered enterprises in Sweden, over 800 000 enterprises. This register, however, does not include any description of activities apart from the NACE code. The NACE code is not specified enough to identify environment enterprises outside the core industries.

The key words used in this study were:

Aluminium	Low energy
Bio gas	Nature
Compost	Purification
Ecology	Rape
Electric cars	Recycling
Energy forest	Salix (sort of energy forest crop)
Environ	Second hand
Environment	Solar energy
Ethyl alcohol	Sun panel
Ethyl alcohol driven busses	Wind power
Green	

The keywords were selected because they are commonly used in describing the environment area. Some words were chosen because they focus on activities that were not very well covered in the previous study of the environment industry in Sweden.

The described activity of every single enterprise was judged according to the definition given by OECD/EUROSTAT. Some enterprises were found not to fit under the definition. These were left unattended. The enterprises that were found to fit under the definition were selected and their name and description was copied along with some other data such as address. This procedure was also used for the other Internet databases.

2 529 enterprises/establishments were identified from these sources, 2 259 in "Företagsfakta" and 270 in the Business Calendar. From this total, 1 445 from "Företagsfakta" and 179 from the Business calendar could be found in The Swedish Business Register. Only enterprises found in the Swedish Business register are included in the Environment Industry database. The reason is the need to get a proper identification that can be linked with other data sources.

3.4 The internet databases PAR/Bizbook

Another way of classifying enterprises from the former study, and to identify new enterprises in this study, was through other databases. Two were used for identification and classification, through the principal industry information for the enterprises, these were PAR and Bizbook, owned by the Bonnier-group. The information about principal industry in these databases is described not only by NACE code, but also by a more detailed code with an extra digit added to the NACE code.

The PAR database contains 680 000 enterprises and 1 300 000 decision-makers within these enterprises. It is working within three fields of activities:

1. Addresses
2. Campaign management
3. System information

Bizbook is a free service PAR has on the Internet. It is a digital catalogue that works as a guide to Swedish economic life. It contains information about 672 000 enterprises, their principal industry and 1 000 000 decision-makers in those enterprises. In these registers, 3 057 enterprises/establishments were identified (2 019 from PAR and 1 038 from Bizbook) and from these, 2 299 were found in the Swedish Business Register (1 356 from PAR and 943 from Bizbook).

3.5 The Swedish EnviroNet

The Swedish EnviroNet is located on the Internet. It is financed via the budget of the Swedish Environmental Protection Agency and it is governed by a board consisting of representatives of different important user groups.

On the Swedish EnviroNet, data and information on the Swedish environment and the environmental work in Swedish governmental agencies, companies and non-governmental organisations (NGOs) are collected. The Swedish EnviroNet is catalogued in groups. In the Environmental Catalogue it is possible to find links to web documents and members' sites. In the E-mail catalogue (English version pending) addresses of persons dealing with environmental issues are listed. The Swedish version contains one facility not available in the English version, namely the Internet version of "Who Does What in Environmental Sweden" - a complete directory of governmental agencies, organisations and consultants dealing with environmental issues.

The report "Who does what in Environmental Sweden?" was used to find NGOs and consultants dealing with environment and their field of activity. 255 enterprises were identified, but only 160 were found in the Swedish Business Register.

3.6 Eco-Tech exhibition and Ecology 99

The tenth "Eco-Tech 99", and at the same time Ecology conference, were held in September 7-10, 1999 at the Swedish Exhibition and Congress Centre in Gothenburg. It is the only trade fair in Scandinavia dedicated to the entire environmental sector and the Ecology conference is Scandinavia's largest environmental conference which attracts speakers who are leading in their fields.

At Eco-Tech 99, groups, companies, organisations, authorities, municipalities and public companies have the opportunity to display the work they are doing for the environment. The trade fair also offers companies the chance to meet customers and people interested in their work in a more direct and personal way.

About 250 exhibitors participated on the Eco-Tech 99 fair. Some of these exhibitors did not fit into the definition for environment industry, but 224 of them did. From these exhibitors 148 enterprises were found in the Swedish Business Register.

3.7 Survey of waste management (Statistics Sweden)

During 1999, Statistics Sweden has been working with a survey of solid waste management on commission for The Swedish Environmental Protection Agency. The purpose is to make an inventory of solid waste management in Sweden. The solid waste survey found 477 treatment establishments and/or enterprises which were categorised as establishments/enterprises dealing with solid waste management. 383 of these were found in the Swedish Business Register and integrated into the Environment industry database.

3.8 Ecotourism

In Sweden there is an organisation called The Swedish Ecotourism Association. It was established in 1996 to support ecotourism in Sweden internationally and to support an increased environmental travel thinking. The Swedish Ecotourism Association has provided information on the individual members which could fit into the Ecotourism Society in USAs definition for ecotourism¹⁵. The last study on environment industry identified ecotourism enterprises found in the telephone directory. In this study a combination between the telephone directory and the Swedish Ecotourism Associations members were made and ten enterprises did fit under the definition. Of these ten, six were found in the Swedish Business Register.

3.9 The Swedish Windpower Organisation

Today most of Sweden's energy production comes from hydroelectric and nuclear power. However, energy resources like wind energy are growing.

Sweden is rather well suited for wind power utilisation with its sparsely populated, windy coasts and mountain regions. In April 1999 there were 434 wind power units in Sweden. However, the development of wind power stations is marginal. Only 0,2 per cent of Sweden's electricity came from wind energy in 1998. However, The Swedish Commission for Windpower has, in SOU 1999:75, made an estimation that Sweden need an extension of wind power stations for energy production. The wind power investigation suggests an enlargement of wind power energy production to 10 TWh per year, from today's 0,4 TWh per year, an increase of 2400 per cent.¹⁶

¹⁵ The Swedish Ecotourism Association (1998), page 19.

¹⁶http://www.regeringen.se/galactica/service=irnews/owner=sys/action=obj_show?c_obj_id=29754

The Swedish Windpower Organisation (SVIF) is a non-profit and politically non-committed organisation and a member of the Swedish Energy-organisation's National Association, SERO.

SVIF aims to spread general information about windpower, work actively locally, initiating or co-operating in projects and look after wind power plant owner's interests, locally as well as on the national level.

From SVIF, 33 enterprises and organisations were identified, 20 of these were found in the Swedish Business Register. Five of these enterprises are producers of energy and the other 15 are producers of power plants, or parts of power plants.

3.10 Solar Energy Association of Sweden - SEAS

Radiation from the sun produces 15 000-20 000 times more energy than the earth population globally consumes, energy that, to some extent, can be utilised. There are two ways of utilising solar energy, transformation through sun-cells to produce electricity or through sun-catchers for heating.

The Solar Energy Association of Sweden represents the Swedish solar industry, as well as Swedish research institutes working with solar energy and member of the European Solar Industry Federation (ESIF). The organisation has produced a member matrix for 1999. From this matrix 40 enterprises, from a total of 71, were found in the Swedish Business Register. Ten of the enterprises are dealing with energy production. The others are producers of sun-cells, sun catchers or other products for this type of industry.

3.11 Newspaper articles, Internet and Television

While working with the report a continuous search after enterprises in newspapers, on television and Internet were made and this also resulted in identification of some enterprises that could be found in the Swedish business Register and included in the Environment Industry database.

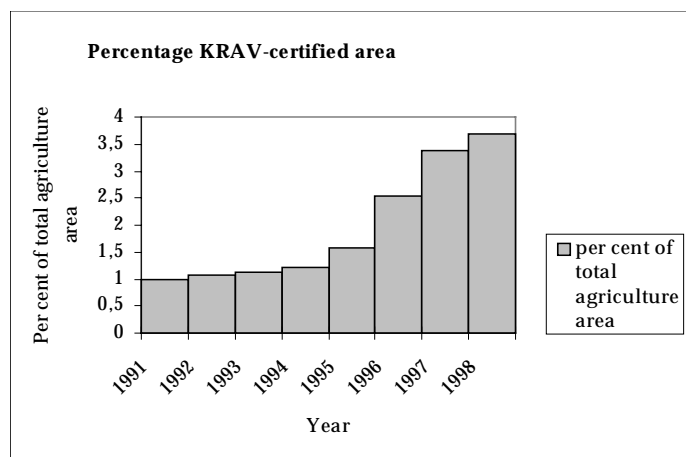
3.12 Sustainable agriculture and forestry

Agriculture

In order to sell products as ecological, the production must be approved and controlled by an authorised organisation. In Sweden this is done by KRAV and DEMETER.

The KRAV logo is an eco-labelling system handled by KRAV, an active member of The International Federation of Organic Agriculture Movements (IFOAM). IFOAM is an umbrella organisation which gathers organisations for farmers, scientists, educationalists and certifiers from almost every country in the world who meet the IFOAM Basic Standards and also the EEC regulation for organic production. KRAV is a key player in the organic market in Sweden, organised as an incorporated association with three tasks; to set standards for organic agriculture, certify according to the standards and inform about the production and the KRAV-label. The KRAV-certified area has increased rapidly during the last years.¹⁷

¹⁷ <http://www.krav.se/pl/sprak/english.htm>



Source: <http://www.krav.se>

The other eco-label is DEMETER, which is handled by the Swedish Demeter-association. The association was established in 1957 and has (at the moment) the most rigorous rules for organic production. It has been an inspiration source for the development of and co-operation with KRAV.

Both KRAV and DEMETER are authorised by The Swedish National Board of Agriculture and The Swedish National Food Administration, to carry out inspection of organic production in Sweden.

The latest information for certified agriculture in Sweden is from 1998. In 1998, 102 554 hectares, or 3,7 per cent of the total agricultural area was KRAV-certified in Sweden. The area was divided between 2 571 approved farmers. In the efforts to include the latest information, contact was taken with KRAV and DEMETER, and in July 1999 a total of 2 935 enterprises were KRAV or DEMETER certified (2 804 KRAV, 54 DEMETER and 77 with both certifications).

The 2 935 KRAV and/or DEMETER certified enterprises were linked with the Swedish Business Register. Only 1 059 were found, 1 016 were KRAV-certified, 14 DEMETER and 29 both.

This means that only about 36 per cent of the certified enterprises could be included in the Environment Industry database. One reason for this is that many farms are run as estates of deceased persons and not under the name of the person who actually runs the farm (normally the heirs or heiresses). KRAV and/or DEMETER certification on the other hand, is often done under the heirs' or heiresses' names.

Acreage-support for ecological agriculture

Since 1995 there is also a yearly acreage-support for ecological agriculture within the EU's environment program. This support is administrated by The Swedish National Board of Agriculture and the County Administrative Boards. The support is only given for ecological cultivated area and not for pasture. The principal is formulated as a payment for a certain environment service and not as production of ecologically grown products.

In 1998, 8,6 per cent of the total area under cultivation was given acreage-support for ecological agriculture. This also includes some of the area that was KRAV and/or DEMETER certified. The enterprises given acreage-support are not included in this study since they were not considered to fall under the OECD/EUROSTAT definition of environment industry.

Forestry

The forestry industry in Sweden is in charge of 22 621 000 hectares productive woodland (i.e. where timber production is at least 1 m³ per hectare and year)¹⁸. This is about half of the country area.

There are two kinds of forestry-certifications in Sweden, the Swedish FSC-certification (managed by Skogssällskapet¹⁹) and the Swedish PEFC-certification (managed by the Swedish Forest owner-movement²⁰).

The reason why there are two different kinds of certification-systems is that the Swedish Forest owner-movement thought that the FSC is more adjusted for larger industrial forestry (who have about 40 per cent of the total timber production) and not for non-industrial private ownership. Therefore the Swedish Forest owner-movement started the Swedish PEFC-certification system, which is built on the European PEFC-system.

In total, there are 9 602 463 hectares certified forest in Sweden today (1999). Either with FSC-certification (95,7 per cent of the certified forest) or the Swedish PEFC-system (4,3 per cent). This means that almost 43 per cent of the total forest area (22 621 000 hectare) is certified. Of this certified area 9 large enterprises own 9 023 300 hectares, i.e. 94 per cent. The rest is owned by 3 449 non-industrial owners.

The Forest Stewardship Council (FSC)

The Forest Stewardship Council²¹ is an international non-profit organisation founded in 1993 to support environmentally appropriate, socially beneficial and economically viable management of the world's forests. FSC also supports the development of national and local standards that implement the international Principles and Criteria of Forest Stewardship at the local level. These standards are developed by national and regional working groups which work to achieve consensus amongst the wide range of people and organisations involved in forest management and conservation in each part of the world.

The FSC accreditation system is based upon the relevant ISO-guides and covers the environmental goals for forestry within the frame for environmental managing systems and is therefore fully compatible with ISO and EMAS.

The FSC-certificate for forestry is voluntary, but under a tremendous development. In December 1998, 5 651 300 hectares of productive forest was certified in Sweden. In June 1999 it was 9 194 300 hectares, an increase of 62,7 per cent during 6 months. All the land owners are listed and available on FSC-Sweden's web site.

The Pan European Forest Certification (PEFC)²²

Since July 1998, forest owners and forest industry organisations in a number of European countries (Austria, Belgium, Denmark, Finland, France, Germany, Italy, Latvia, Luxembourg, Norway, Portugal, Spain, Sweden, Switzerland and Great Britain) have been preparing a Pan-European certification framework. In these countries the forest area under non-industrial private ownership covers approximately 100 million hectares (or approximately 75 per cent of the total) and a total annual cutting amount of about 270 million m³.

¹⁸ <http://www.svo.se/>

¹⁹ <http://www.skogssallsskapet.se/>

²⁰ <http://www.skogsagarna.se/>

²¹ <http://www.fsc-sweden.org>

²² http://www.faf.de/paneuro_e.htm

In October 1998, the PEFC Scheme was presented. By developing a European certification standard, the European forestry industry groups hope to create an international alternative to the already established FSC.

PEFC offers a framework for the establishment of comparable national certification systems and their mutual recognition. It contributes to the promotion of economically viable, environmentally appropriate and socially beneficial management of forests. A major target is to establish an internationally credible forest certification scheme for forest certification initiatives under progress in different countries and for their mutual recognition.

Problems with incorporation of forestry enterprises

Certification of wooded area is rather new in Sweden and therefore it is a bit difficult to incorporate forestry enterprises in the environmental industry database. When it comes to the nine industrial forestry enterprises, they have almost 100 per cent certified forests. When it comes to the 3 449 non-industrial owners it is more difficult to estimate the certified part of these enterprises total forested area. One reason is the group-certifications these enterprises can join. Therefore none of the forestry enterprises are incorporated in the Environment industry database at this time.

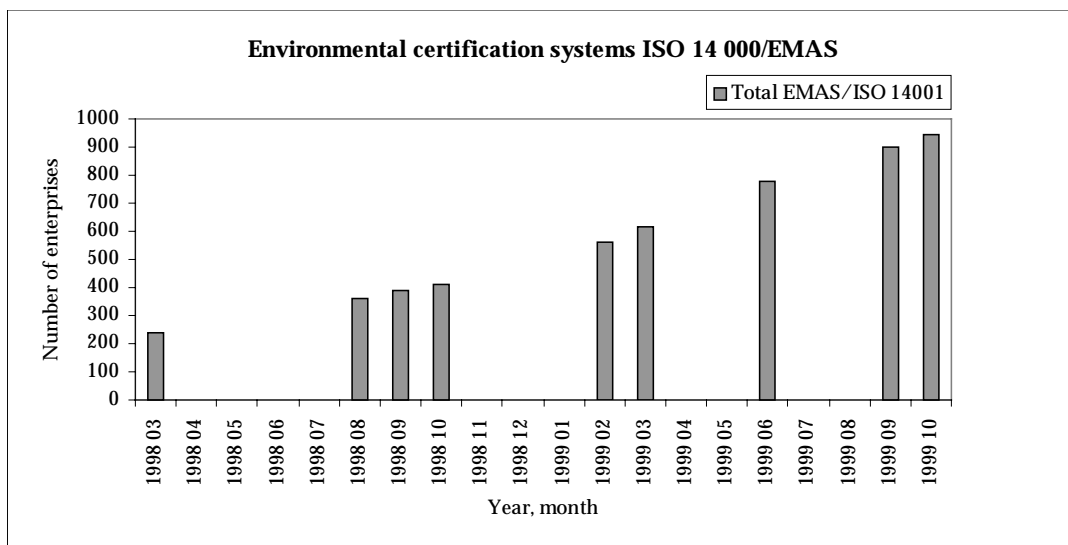
3.13 Environmental certification systems

Today, there are two different kinds of environmental certification systems for enterprises in Sweden:

- EMAS
- ISO 14 001

There are also special certification systems for forestry; FSC-Sweden and PEFC-Sweden and agriculture; KRAV and DEMETER.

As mentioned in the previous report, the amount of environment certified enterprises have increased rapidly during the last few years. During the period from March 1998 to October 1999, 709 ISO 14 001 and/or EMAS certified enterprises have been registered. This is an increase of almost 400 per cent during a period of twenty month.



Source: <http://www.sis.se>

Organisations responsible for these environment certificates have been contacted in this project and information on individual enterprises are available in the publication "Environment certified enterprises in Sweden 1999"²³. Although the certified enterprises are not automatically a part of the definition of environmental industry enterprises given by the OECD/EUROSTAT working group, it might be interesting to use these enterprises in future work, for instance to build up a database that includes the different environment industry as well as "environment driven" enterprises.

3.14 Environmental Investment Funds

The enterprises included in the environmental funds have not been incorporated in the Environment industry database. Most of these enterprises do not fit under the OECD/EUROSTAT definition, others are located outside Sweden. However it is of interest for this line of work to note the growing interest in environment investments among fund commissioners.

There are 10 funds in Sweden today that can be classified as environmental funds. They differ a lot when it comes to regulations and rules on which companies the funds are allowed to contain. This makes it difficult to compare them. Roughly there are four different kinds of environmental funds:

- 1 Funds that invest in traditional enterprises which make an environment analyse/revision.
- 2 Funds that do not have any, or a few, restrictions when it comes to investments in stock. Instead they give part of the fund capital stock to different environment organisations or scholarships.
- 3 Funds that invest only in companies involved in the environment sector, but the companies belonging to this group differ a lot between the different funds.
- 4 Funds that are called ethic-funds, i.e. funds that do not invest in companies that are involved in the weapon or car-industry, etc.

The market of environmental funds will probably increase in the near future, as awareness of the environment issues among the Swedish population increases. Another area where environment awareness has increased is among insurance companies.

3.15 Recycling insurance "Återvinningsförsäkring"

The insurance company "Länsförsäkringar" has recently introduced a new kind of insurance "Återvinningsförsäkring"²⁴. The main idea of the insurance is to reduce producers' risks when it comes to costs for their responsibility for what they produce and also to encourage the development of products that are more adapted to the environment. It is hard to estimate the recycling-cost for products with a long life cycle and the insurance eliminates this uncertainty. The producer pays a fee for every product, the amount depends on the product, to Länsförsäkringar who takes over the responsibility for recycling the product in the future. The recycle insurance has not been included in the Environment industry database.

²³ Challengium Information (1999).

²⁴ <http://www.lansforsakringar.se/miljo/atervinningsforsakring/atervinning.htm>

4 Classifying enterprises and establishments

4.1 Classifying the environment enterprises and establishments by environment industry classes

The classes (or segments) of the environment industry are described in the previous report. The same schedule is reproduced below. This work builds on the former report and efforts have now been made to allocate the identified enterprises and establishments to environment industry classes.

Classes of the environment industry

Code	Environmental activities	Products, services and construction linked to for example:
A	Pollution Management	
A1	Air pollution control	Treatment and/or removal of exhaust gases
A2	Wastewater management	Emissions to water. Collection, treatment and transport of wastewater. Wastewater reuse systems
A3	Waste management	Collection, treatment, management, storage and recovery of waste. Excludes manufacture of new products from recovered material
A4	Soil and groundwater	Emissions to soil and groundwater. Soil sanitation.
A5	Noise and vibration	Reduction of (mainly outdoor) noise
A6	Monitoring, control, etc. including:	
A6a	Environmental R&D	R&D linked to development of cleaner products, processes and technologies as well as general research on the environment
A6b	Education, training, information	Environmental education, training and information by specialised institutions or as workplace activities. Activities of the general education system are not included
A6c	Analytical services, data collection and assessment	Environmental engineering, analytical services and the like
B	Cleaner Technologies and Products	
B1	Cleaner/resource-efficient technologies	Reduced impact from production, e.g.: decrease material inputs, reduce energy consumption, recover valuable by-products, reduce emissions, minimise waste disposal problems.
B2	Cleaner/resource-efficient products	Reduced impact from use of products, e.g.: decrease material inputs, improve product quality, reduce energy consumption, reduce emissions, minimise waste disposal problems.
C	Resource Management	
C1	Indoor air pollution control	Treatment and renewal of indoor air to remove pollutants. Does not include air-conditioning
C2	Water supply	Collection, purification and distribution of potable water
C3	Recycled materials	Manufacturing new materials or products from recovered waste or scrap
C4	Renewable energy plant	Generation, collection and transmission of energy from renewable sources, including biomass, solar, wind, tidal or geothermal energy.
C5	Heat/energy saving and management	Reducing heat and energy use or minimising loss
C6	Sustainable agriculture and fisheries	Reducing environmental impact of agriculture and fishery.
C7	Sustainable forestry	Programmes and projects for reforestation and forest management on a long-term sustainable basis
C8	Natural risk management	Preventing or reducing the impact of natural disasters
C9	Eco-tourism	Tourism that involves protection of natural and cultural heritage, etc.
C10	Other	Including nature conservation, habitats and biodiversity

The division was initially made from the description of the business activity, where this was available. Identified enterprises from sources lacking this description have been divided according to the NACE code or the name. This is the first attempt to make this division and the method is by no means fully developed. However this is an example of what can be done using only register data. In future work it is necessary to make surveys in order to improve the Environment Industry database and the classification into classes of the environment industry. The division into classes has been linked to the database containing the identified enterprises. This means that other variables such as employment and turnover can be described for each class.

Enterprises and establishments by environment industry classes

Code	Environmental activities	Number of enterprises	Number of establishments
A	Pollution Management (Total)	2997	4925
A1	Air pollution control	20	59
A2	Wastewater management	164	740
A3	Solid waste management	1967	2713
A4	Remediation and clean-up of soil, surface water and ground water	58	84
A5	Noise and vibration abatement	14	20
A6	Environmental monitoring, analysis and assessment;		
A6a	Environmental R&D	20	22
A6b	Education, training and information	118	254
A6c	Analytical services, data collection and assessment	636	1033
B	Cleaner Technologies and Products (Total)	191	416
B1	Cleaner/resource-efficient technologies and processes	123	215
B2	Cleaner/resource-efficient products	68	201
C	Resource Management (Total)	2820	4430
C1	Indoor air pollution control	893	1451
C2	Water supply	99	671
C3	Recycled materials	169	206
C4	Renewable energy plant	195	457
C5	Heat/energy saving and management	382	499
C6	Sustainable agriculture and fisheries	1038	1093
C7	Sustainable forestry	10	10
C9	Eco-tourism	17	17
C10	Other	17	26
X	No classification of Environmental activity (Total)	719	800
Grand total		6727	10571

The largest classes according to number of enterprises and establishments were "Solid waste management", "Sustainable agriculture and fishery" and "Indoor air pollution control".

4.2 Status of specialisation of the identified enterprises and establishments

In the previous work, the ambition was that all identified enterprises within the environment industry should have more than 50 per cent of their turnover from an activity under the definition of environment industry. There were problems however, and still are, to be certain that the identified enterprises are correct. In order to describe these uncertainties the enterprises have now been divided into five groups.

Status groups

Status

Primary enterprises/establishments, more than 50 % is within the definition
 Enterprises/establishments where not all establishments are within the definition
 Secondary, enterprises/establishments where the environment part is substantial
 Enterprises/establishments producing multi-purpose products
 Enterprises/establishments lacking necessary data to allow certain definition

In this report these groups are presented together if nothing else is specified. However, "Primary environment industry" is the largest group with almost 62 per cent of the identified active enterprises. The other enterprises have been classified in other status groups, or have not been classified at all.

Enterprises and establishments by status

Status	Number of enterprises	Number of establishments
Primary enterprises/establishments, more than 50 % is within the definition	4131	6360
Enterprises/establishments where not all establishments are within the definition	11	30
Secondary, enterprises/establishments where the environment part is substantial	560	1332
Enterprises/establishments producing multi-purpose products	914	1326
Enterprises/establishments lacking necessary data to allow certain definition	791	1133
No status classification	320	390
Total	6727	10571

The enterprises and establishments in the 'core industries' are all considered as "Primary enterprises/establishments". When describing the core industries, the NACE code for enterprises and the NACE codes for establishments are held apart.

4.3 Linking the identified enterprises and establishments to the Swedish Business Register –classification by NACE groups

The Swedish Business Register includes all legal units or individuals who run an activity, large or small. The enterprises and establishments each have a unique identification code which is used in all registers and surveys dealing with enterprise statistics. They are also given an activity code which is divided into 60 two-digit NACE-groups and in these 60 groups also into more detailed five-digit groups. This means that information on the core industries of the environment industry is already available.

The following variables from the Swedish Business register were of interest to include in the Environment Industry database. Enterprises with NACE codes, number of employees, establishments, address (for geographical analysis), identification code, status in the VAT register and starting year.

In the work of identifying enterprises, most of the names were found as enterprises (8 330) and some as establishments (1 219). About 3 000 names were not found at all in the Swedish Business Register. There are different reasons why some names were not found. The enterprise can have one name registered and use another name or a different spelling when advertising. Many farmers were hard to locate in the business register because of delayed distribution of estate for tax reasons.

When a name was identified and classified according to status and environmental activity, all establishments sorting under the identified enterprise were given the same classification. In the cases where establishments were identified, the establishment was given the classification. The core industries were an exception to this rule, as they were not classified according to any source outside the Swedish Business Register. The core industries enterprises and establishments were chosen from their first NACE code. This means that the enterprises and establishments in the core industries are partly, but not always the same. Enterprises and establishments differ, especially when it comes to municipal activities.

From the 8 330 enterprises that were identified, 6 727 are active according to the Swedish Business Register. They do not have a closure date and therefore still exist as active enterprises. This means that 1 603 are inactive enterprises or do not exist any longer. For the active enterprises information about enterprise identity number, number of establishments, starting year, NACE code, number of employees and status in the VAT register have been collected from the Swedish Business Register. The two largest NACE-groups according to number of enterprises are NACE 74 "Other business activities" and 45 "Construction", the largest NACE groups in terms of numbers of establishments were "Sewage and refuse disposal" and 74 "Other business activities".

Enterprises and establishments divided after NACE code

NACE		Number of enterprises	Number of establishments
25120	Retreading	124	130
37	Recycling of metal waste and scrap	143	155
51570	Wholesale of waste and scrap	871	986
90	Sewage and refuse disposal, sanitation and similar activities	741	1611
Sum for Core industries		1879	2882
01	Agriculture, hunting and related service activities	678	698
02	Forestry, logging and related service activities	60	67
05	Fishing, operation of fish hatcheries and fish farms	1	6
10	Mining of coal and lignite; extraction of peat	5	6
14	Other mining and quarrying	5	37
15	Manufacture of food products and beverages	13	19
17	Manufacture of textiles	8	12
19	Tanning and dressing of leather	1	1
20	Manufacture of wood and of products of wood and cork, except furniture	33	42
21	Manufacture of pulp, paper and paper products	13	31
22	Publishing, printing and reproduction of recorded media	30	38
23	Manufacture of coke, refined petroleum products and nuclear fuel	3	4
24	Manufacture of chemicals and chemical products	24	31
25excl. 25.120	Manufacture of rubber and plastic products	31	34
26	Manufacture of other non-metallic mineral products	17	67
27	Manufacture of basic metals	2	3
28	Manufacture of fabricated metal products, except machinery and equipment	109	122
29	Manufacture of machinery and equipment n.e.c.	149	223
30	Manufacture of office machinery and computers	1	1
31	Manufacture of electrical machinery and apparatus n.e.c.	15	19
32	Manufacture of radio, television and communication equipment and apparatus	1	1
33	Manufacture of medical, precision and optical instruments, watches and clocks	14	25
34	Manufacture of motor vehicles, trailers and semi-trailers	8	9
35	Manufacture of other transport equipment	1	1
36	Manufacture of furniture; manufacturing n.e.c.	9	11
40	Electricity, gas, steam and hot water supply	53	439
41	Collection, purification and distribution of water	79	640
45	Construction	908	1299
50	Sale, maintenance and repair of motor vehicles and motorcycles	35	252
51excl. 51.570	Wholesale trade and commission trade, except of motor vehicles and motorcycles	581	832
52	Retail trade, except of motor vehicles and motorcycles	163	192
55	Hotels and restaurants	20	24
60	Land transport; transport via pipelines	88	98
61	Water transport	3	4
62	Air transport	1	3
63	Supporting auxiliary transport activities; activities of travel agencies	43	53
64	Post and telecommunications	1	1
65	Financial intermediation, except insurance and pension funding	3	4
67	Activities auxiliary to financial intermediation	4	4
70	Real estate activities	76	130
71	Renting of machinery and equipment without operator and of personal and household goods	7	9
72	Computer and related activities	37	53
73	Research and development	39	53
74	Other business activities	1043	1473
75	Public administration and defence; compulsory social security	8	61
80	Education	55	185
85	Health and social work	18	18
91	Activities of membership organizations n.e.c.	34	35
92	Recreational, cultural and sporting activities	31	31
93	Other service activities	17	17
.	No classification in NACE	270	271
Total excl. core industries		4848	7689
Total incl. core industries		6727	10571

A total of 6 727 active enterprises and 10 571 establishments were identified in the Swedish Business Register, but it is important to emphasise that not all establishments are connected to the enterprises in the Environmental Industry database. Some establishments are classified as environmental industry, and therefore integrated in the Environment Industry database, but the enterprises or organisations these establishments are affiliated to are not classified as environment industry, and therefore not integrated in the Environment Industry database.

5 Estimation of the Environment Industry

The Environment industry database consists of two parts. The first part is a list of enterprises and data connected with each enterprise. The second part is a list of establishments and data connected with each establishment. In the enterprise part, it is possible to see all establishments affiliated to each enterprise. These establishments are the basis of the establishment part, but this part also contains establishments affiliated to enterprises which are not relevant for the environment industry. An important example of the latter are local government establishments. For example wastewater treatment plants or environment offices often belong to local government. These establishments have been singled out and are included in the Environment Industry database, because it would be misleading to include the whole local government which is equal to an enterprise in the register.

5.1 Enterprises

All enterprises in the report are classified according to NACE, environment industry class and status of specialisation. The combination possibilities for these three classifications makes it possible to see the main line of business of the environmental industry enterprises mainly exists. The NACE code itself does not provide this possibility.

Number of enterprises

Code	Environmental activities	Primary enterprises	Other catagories	No class.	Total
A	Pollution Management (Total)	2293	704	0	2997
A1	Air pollution control	16	4	0	20
A2	Wastewater management	112	52	0	164
A3	Solid waste management	1861	106	0	1967
A4	Remediation and clean-up of soil, surface- and ground water	11	47	0	58
A5	Noise and vibration abatement	3	11	0	14
A6	Environmental monitoring, analysis and assessment:				
A6a	Environmental R&D	7	13	0	20
A6b	Education, training and information	56	62	0	118
A6c	Analytical services, data collection and assessment	227	409	0	636
B	Cleaner Technologies and Products (Total)	82	109	0	191
B1	Cleaner/resource-efficient technologies and processes	53	70	0	123
B2	Cleaner/resource-efficient products	29	39	0	68
C	Resource Management (Total)	1756	1064	0	2820
C1	Indoor air pollution control	17	876	0	893
C2	Water supply	89	10	0	99
C3	Recycled materials	140	29	0	169
C4	Renewable energy plant	127	68	0	195
C5	Heat/energy saving and management	355	27	0	382
C6	Sustainable agriculture and fisheries	1014	24	0	1038
C7	Sustainable forestry	0	10	0	10
C9	Eco-tourism	8	9	0	17
C10	Other	6	11	0	17
X	No classification for Environmental activity (Total)	0	399	320	719
Grand total		4131	2276	320	6727

By dividing the enterprises both by NACE code and environment industry class, the description can be more specified. For example, there are many enterprises in the NACE code "Construction" combined with the environment activity "Indoor air pollution control".

Number of enterprises, NACE/environment activity

NACE/Environmental activities	Air pollution control	Wastewater management	Waste management	Soil and groundwater	Noise and vibration	Environmental R&D	Education, training	Information	Analytical services, data collection and assessment	Cleaner/resource-efficient technologies	Cleaner/resource-efficient products	Indoor air pollution control	Water supply	Recycled materials	Renewable energy plant	Heat/energy saving and management	Sustainable saving and agriculture	Sustainable fisheries	Sustainable forestry	Eco-tourism	Other	Total
25120	0	0	0	0	0	0	0	0	0	0	0	0	0	124	0	0	0	0	0	0	0	124
37	0	0	143	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	143
51570	0	0	871	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	871
90	0	38	703	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	741
Total Core industries	0	38	1717	0	0	0	0	0	0	0	0	0	0	124	0	0	0	0	0	0	0	1879
01	0	3	2	0	0	0	2	6	3	0	1	1	0	6	1	624	1	1	0	27	678	
02	0	0	0	0	0	0	0	4	0	1	1	0	0	6	1	35	9	0	1	2	60	
05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
10	0	0	1	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	1	5	
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	4	0	5	
15	0	0	2	1	0	0	0	0	1	1	0	0	0	0	0	6	0	0	0	2	13	
17	0	0	0	0	0	0	0	0	1	1	3	0	0	0	0	1	0	0	0	2	8	
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
20	0	0	2	0	0	0	1	0	3	1	1	0	1	10	0	3	0	0	0	11	33	
21	0	0	0	0	0	0	0	1	2	0	1	0	8	0	0	0	0	0	0	1	13	
22	0	0	0	0	0	0	8	2	0	6	0	0	2	0	0	2	0	0	0	10	30	
23	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3	
24	0	2	1	1	0	0	0	2	10	2	0	0	2	1	0	0	0	0	0	3	24	
25excl.25.120	1	0	9	0	1	0	0	0	4	0	2	0	4	1	2	0	0	0	0	7	31	
26	0	0	4	0	1	0	0	0	2	1	0	0	3	0	0	1	0	0	2	3	17	
27	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	2	
28	1	4	4	2	1	0	0	4	1	0	72	0	5	6	1	2	0	0	0	6	109	
29	5	14	18	1	0	0	0	7	3	1	41	7	0	11	23	0	0	0	0	18	149	
30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
31	0	0	2	0	0	0	0	2	0	0	5	0	0	3	0	1	0	0	0	2	15	
32	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
33	1	2	0	0	0	0	0	4	0	1	1	0	0	0	0	1	0	0	0	4	14	
34	0	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4	8	
35	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
36	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	2	0	0	0	4	9	
40	0	0	6	0	0	0	0	2	0	11	0	2	0	28	4	0	0	0	0	0	53	
41	0	0	0	0	0	0	0	0	0	0	0	79	0	0	0	0	0	0	0	0	79	
45	4	11	23	7	8	0	0	11	6	9	521	4	1	14	211	30	0	0	1	47	908	
50	1	0	8	1	0	0	0	0	7	1	2	0	2	1	0	7	0	0	0	5	35	
51excl. 51.570	3	48	53	6	2	0	2	28	38	12	107	4	7	48	67	21	0	0	0	135	581	
52	0	1	0	0	0	0	3	5	17	1	7	1	7	12	35	21	0	0	0	53	163	
55	0	0	2	0	0	0	1	0	1	0	1	0	0	1	0	6	0	2	0	6	20	
60	0	2	39	4	0	0	0	0	0	0	1	0	1	3	0	27	0	0	1	10	88	
61	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	3	
62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
63	0	0	10	3	0	0	0	2	1	0	0	0	0	0	0	5	0	9	1	12	43	
64	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	
67	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	4	
70	0	1	6	1	0	0	0	3	0	1	10	0	0	1	4	27	0	0	1	21	76	
71	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	4	7	
72	0	0	1	1	0	0	1	10	1	0	2	0	1	1	0	9	0	0	0	10	37	
73	1	1	1	0	0	14	2	8	0	0	1	0	0	3	0	1	0	0	1	6	39	
74	2	32	43	29	1	5	42	503	14	17	102	1	1	22	23	33	0	0	4	169	1043	
75	0	0	1	0	0	1	0	5	0	0	0	0	0	0	1	0	0	0	0	0	8	
80	0	0	0	0	0	0	34	9	0	0	0	0	0	0	0	1	0	2	0	9	55	
85	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	8	0	1	0	7	18	
91	0	0	1	0	0	0	14	5	0	0	2	0	0	0	0	2	0	1	0	9	34	
92	0	0	0	0	0	0	4	0	0	0	0	0	0	1	16	0	0	0	0	10	31	
93	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	7	0	0	0	8	17	
.	0	5	4	1	0	0	3	10	3	1	3	0	0	11	8	137	0	0	0	84	270	
Total excl. core industries	20	126	250	58	14	20	118	636	123	68	893	99	45	195	382	1038	10	17	17	719	4848	
Total incl. core industries	20	164	1967	58	14	20	118	636	123	68	893	99	169	195	382	1038	10	17	17	719	6727	

5.2 Turnover, export and import

The register for value added tax (VAT register) includes all enterprises liable for VAT at the Swedish National Tax Board, with a turnover over 1 000 000 SEK.

Of the variables provided by the VAT register, the turnover, export and import of goods and services are of interest in this study.

There are differences between the Swedish Business Register and the VAT register, as can be seen in the table below. This depends on the fact that in the Register for VAT, only enterprises liable to tax with a turnover over 1 million SEK, are included, whereas in the Business Register all legal units or individuals who run an activity are included.

Environment industry enterprises in the Swedish Business register and the VAT register.

NACE		<i>Number of enterprises in the Business Register</i>	<i>Number of enterprises in the VAT Register</i>	<i>Enterprises not found in VAT, in per cent</i>
25120	Retreading	124	116	6
37	Recycling of metal waste and scrap	143	117	18
51570	Wholesale of waste and scrap	871	580	33
90	Sewage and refuse disposal, sanitation	741	577	22
Total Core industries		1879	1390	26
01	Agriculture and hunting	678	219	68
02	Forestry and logging	60	14	77
05	Fishing and fish farms	1	1	0
10	Mining of coal and lignite	5	4	20
14	Other mining and quarrying	5	4	20
15	Food products and beverages	13	9	31
17	Textiles	8	6	25
19	Tanning and dressing of leather	1	-	100
20	Wood and of products of wood and cork	33	21	36
21	Pulp, paper and paper products	13	11	15
22	Publishing and printing	30	23	23
23	Coke, refined petroleum products and nuclear fuel	3	3	0
24	Chemicals and chemical products	24	17	29
25 excl.25.120	Rubber and plastic products	31	26	16
26	Other non-metallic mineral products	17	14	18
27	Basic metals	2	2	0
28	Fabricated metal products	109	99	9
29	Machinery and equipment n.e.c.	149	136	9
30	Office machinery and computers	1	-	100
31	Electrical machinery and apparatus n.e.c.	15	13	13
32	Radio, television and communication equipment	1	-	100
33	Medical, precision and optical instruments	14	11	21
34	Motor vehicles, trailers and semi-trailers	8	6	25
35	Other transport equipment	1	1	0
36	Furniture; manufacturing n.e.c.	9	7	22
40	Electricity, gas, steam and hot water supply	53	50	6
41	Collection, purification and distribution of water	79	36	54
45	Construction	908	763	16
50	Sale, maintenance and repair of motor vehicles	35	17	51
51 excl. 51.570	Wholesale trade and commission trade	581	436	25
52	Retail trade, except of motor vehicles	163	85	48
55	Hotels and restaurants	20	12	40
60	Land transport; transport via pipelines	88	67	24
61	Water transport	3	2	33
62	Air transport	1	1	0
63	Supporting auxiliary transport activities	43	28	35
64	Post and telecommunications	1	1	0
65	Financial intermediation	3	3	0
67	Activities auxiliary to financial intermediation	4	2	50
70	Real estate activities	76	46	39
71	Renting of machinery and equipment	7	5	29
72	Computer and related activities	37	20	46
73	Research and development	39	34	13
74	Other business activities	1043	668	36
75	Public administration and defence	8	8	0
80	Education	55	43	22
85	Health and social work	18	10	44
91	Activities of membership organizations n.e.c.	34	31	9
92	Recreational, cultural and sporting activities	31	10	68
93	Other service activities	17	6	65
.	No classification in NACE	270	41	85
Total		6727	4462	34

The tables below are based on data from the 4 462 environment industry enterprises that were found in the VAT register.

The turnover for the enterprises in the environment industry was about 163 billion SEK or almost 4 per cent of total turnover from the VAT register in 1998. 2265 enterprises are not included in the VAT register because their turnover is below 1 million SEK. This leads to a small underestimation - even if each of the excluded enterprises had a turnover of 1 million SEK, the underestimation would only be 2.3 billion SEK (or 1.4% of total environment industry turnover). Another source of underestimation are the establishments that do not have an affiliated enterprise or organisation in the enterprise part of the environment industry database. This problem mainly affects economic data about public activities. For example waste management can be maintained by private enterprises on commission from the local government/the taxpayers. The turnover from this activity is included in this study. If the same activity is done by an establishment belonging to local government, the turnover and other economic data are not included in this study. The reason is that it would be misleading to include the whole local government and there are no economic data available at establishment level. All economic data in this study refer to enterprises.

According to the consultant report "Data Collection on Eco-Industries in the EU"²⁵ the turnover for the Swedish environment industry was estimated at 20 billion SEK in 1994. This report was part of an exercise to estimate the approximate size of the environment industry EU-wide for the European Commission (for overall results see EUROSTAT Working Paper 2/1997/B/1: An estimate of Eco-Industries in the European Union 1994).

The turnover resulting from this study is eight times higher than the estimated amount in the consultants' report. There are various methodological reasons for this difference:

- The consultants' report focused on the environment industry in a narrow sense using the OECD/EUROSTAT interim (more restricted) definition of the environmental industry. The consultants' report thus covers mainly pollution management – group A and some part of group B of the classification - whereas this study includes also groups B and C.
- The method used by the consultants was a demand-side method – using available environmental expenditure data to estimate the production of environmental goods and services. It should be mentioned that the existing data on environmental expenditure are far from comprehensive. A large part of the expenditure refers to municipalities. Economical data on municipalities are not included in the present study.
- The present study uses a supply-side approach which presents total turnover of the enterprises engaged in environment industry activities – therefore the data also include non-environmental turnover (see above – status of specialisation). The consultant report measures only the value of the environment activity.
- The results refer to different years. For Sweden there is probably a substantial growth in the environment industry between 1994 and 1998.

The effects of these methodological differences cannot be estimated in a reliable way. However, it can be assumed that the consultants' report underestimates the Swedish environment industry (narrow definition). The underestimation, however is probably less than eight times. The environment industry database on the other hand does not fully cover all classes of the environment industry in Sweden. Especially "Cleaner Technologies and Products" are poorly covered in the present study, mainly due to difficulties in judging different activities according to the definition. A more detailed comparison of demand-side and supply-side results would be useful in future.

²⁵ Ecotec, BIPE and IFO (1996). The Swedish Eco-Industry: Country Summary.

Now it is possible to group the information from the VAT register (turnover, export and import) according to the NACE code, status and environment industry class, which gives different dimensions when studying the environment industry.

Turnover, export and import for enterprises in the environment industry.

NACE-code		Total turnover from the VAT Register, SEK million	Total exports	Non-EU-Exports	EU-exports	EU-imports
25120	Retreading	885	56	50	6	87
37	Recycling of metal waste and scrap	2627	297	113	184	36
51570	Wholesale of waste and scrap	5828	976	468	509	158
90	Sewage and refuse disposal, sanitation	7616	164	102	62	60
Sum for Core industries		16955	1493	733	761	340
01	Agriculture and hunting	450	4	2	1	4
02	Forestry and logging	918	20	18	2	0
05	Fishing and fish farms	0	0	0	0	0
10	Mining of coal and lignite	39	5	3	2	6
14	Other mining and quarrying	80	0	0	0	0
15	Food products and beverages	3166	310	229	81	178
17	Textiles	327	95	40	54	40
20	Wood and of products of wood and cork	1140	174	51	123	63
21	Pulp, paper and paper products	6167	3668	672	2996	377
22	Publishing and printing	2651	127	58	69	122
23	Coke, refined petroleum products and nuclear fuel	66	0	0	0	32
24	Chemicals and chemical products	4269	1923	1093	830	781
25 excl.25.120	Rubber and plastic products	596	98	51	47	78
26	Other non-metallic mineral products	3544	955	336	619	439
27	Basic metals	65	1	0	1	0
28	Fabricated metal products	1936	568	183	385	80
29	Machinery and equipment n.e.c.	12995	8729	4175	4553	1392
31	Electrical machinery and apparatus n.e.c.	257	4	2	2	16
33	Medical, precision and optical instruments	4403	2811	1584	1227	539
34	Motor vehicles, trailers and semi-trailers	405	157	27	130	23
35	Other transport equipment	2	0	0	0	0
36	Furniture; manufacturing n.e.c.	6	1	0	0	0
40	Electricity, gas, steam and hot water supply	52499	3009	1604	1405	288
41	Collection, purification and distribution of water	1648	0	0	0	2
45	Construction	11641	240	214	26	108
50	Sale, maintenance and repair of motor vehicles	5932	6	4	2	7
51 excl.51.570	Wholesale trade and commission trade	10922	1707	903	804	2107
52	Retail trade, except of motor vehicles	1597	13	11	2	7
55	Hotels and restaurants	8	0	0	0	0
60	Land transport; transport via pipelines	1214	4	4	0	6
61	Water transport	7	0	0	0	0
62	Air transport	105	45	44	1	4
63	Supporting auxiliary transport activities	1825	105	105	0	0
64	Post and telecommunications	0	0	0	0	0
65	Financial intermediation	0	0	0	0	0
67	Activities auxiliary to financial intermediation	1	0	0	0	0
70	Real estate activities	818	17	2	14	10
71	Renting of machinery and equipment	87	0	0	0	0
72	Computer and related activities	325	3	3	0	0
73	Research and development	1542	505	374	131	128
74	Other business activities	10037	1021	888	133	149
75	Public administration and defence	159	0	0	0	0
80	Education	2065	6	6	0	1
85	Health and social work	10	3	1	2	0
91	Activities of membership organizations n.e.c.	46	0	0	0	0
92	Recreational, cultural and sporting activities	30	1	1	0	0
93	Other service activities	15	0	0	0	1
.	No classification in NACE	67	0	0	0	0
Total turnover incl.core industries		163041	27827	13420	14407	7331
% of total turnover from the VAT Register, SEK million		4	3	2	4	2
Total turnover from the VAT Register, SEK million		4320810	969249	581349	387900	392732

The largest turnover was found in NACE code 40, "Electricity, gas, steam and hot water supply". This is explained by the fact that about one third of the Swedish gross supply of energy comes from renewable energy sources. The most important renewable energy sources are hydro-electric power, 247,8 PJ and wood fuels 161,4 PJ²⁶.

The market for environmental goods and services to foreign countries are mainly in the NACE codes "Manufacture of machinery and equipment" (29), "Manufacture of pulp, paper and paper products" (21) and within "Electricity, gas, steam and hot water supply" (40).

Status according to turnover, exports and imports.

Status	Turnover, in SEK million
Primary enterprises, more than 50 % is within the definition	78559
Enterprises where not all establishments are within the definition	454
Secondary, enterprises where the environment part is substantial	42564
Enterprises producing multi-purpose products	19366
Enterprises lacking necessary data to make a certain definition	13580
No Status classification	8519
Total	163041

The table above shows that nearly half of the identified turnover is within the group "Primary enterprises, more than 50 per cent is within the definition".

Environment activities according to turnover, export and import.

Code	Environmental activities	Total turnover according to the VAT Register, SEK million				
		Total	EU Exports	EU Exports	EU Exports	EU Imports
A	Pollution Management	53548	10161	6095	4065	2174
A1	Air pollution control	1865	1098	647	452	217
A2	Wastewater management	6189	2881	1729	1152	742
A3	Solid waste management	28412	2652	1482	1170	461
A4	Remediation and clean-up of soil, surface water and groundwater	997	5	4	1	7
A5	Noise and vibration abatement	547	258	91	167	131
A6	Environmental monitoring, analysis and assessment;					
A6a	Environmental R&D	76	11	11	0	0
A6b	Education, training and information	2456	52	49	4	5
A6c	Analytical services, data collection, analysis and assessment	13006	3203	2083	1120	610
B	Cleaner Technologies and Products	8814	2149	929	1221	1030
B1	Cleaner/resource-efficient technologies and processes	6370	1740	756	984	792
B2	Cleaner/resource-efficient products	2443	409	173	236	238
C	Resource Management	89558	11491	4635	6856	2983
C1	Indoor air pollution control	18051	3045	1280	1765	1057
C2	Water supply	2560	153	100	53	181
C3	Recycled materials	8568	3848	788	3060	588
C4	Renewable energy plant	49976	3214	1691	1523	514
C5	Heat/energy saving and management	5170	403	172	231	289
C6	Sustainable agriculture and fisheries	4346	767	549	218	298
C7	Sustainable forestry	11	0	0	0	0
C9	Eco-tourism	6	0	0	0	0
C10	Other	870	60	54	6	56
X	No classification for Environmental activity	11121	4027	1761	2266	1145
Grand total		163041	27827	13420	14407	7331

²⁶ EUROSTAT 2/1999/B/3 (1999). The Environmental Industry in Sweden

Looking at environment activities, the largest turnover was in code C4, "Renewable energy plants". The largest environment activity according to export is code C3, "Recycled materials". The "materials" are often pulp or paper produced from recycled paper found in the NACE code "Manufacture of pulp, paper and paper products". In this way the different divisions are of help when describing what the environment industry consists of.

When it comes to the EU-export share of total export it is interesting to see that the environment industry (without core industries, which has a low export degree) lies above the average when it comes to EU-export. More interesting are the EU-import figures, which shows that the environment industry in Sweden is a net exporter. The enterprises in the VAT as a whole are net importers. It should be noted here that the imports by the environment industry enterprises are not necessarily environmental goods and services.

Turnover, export and import, environment industry enterprises/all enterprises.

	Total turnover, SEK million	Total export, SEK million	EU exports, SEK million	EU imports, SEK million
Environment industry (without core ind)	146086	26334	13647	6991
All enterprises in the VAT register	4320810	969249	387900	392732
Percent Environment industry	3,38	2,72	3,52	1,78

More than half of the export (51.8%) from environment industry enterprises goes to other EU-countries. The rest of the export goes to countries outside the EU. Among all enterprises within the VAT register, 40 per cent of the export goes to other EU countries and 60 percent goes to countries outside the EU.

5.3 Establishments

The establishments within the environment industry consist of all establishments sorting under the identified enterprises and a number of establishments which were identified separately where the enterprise is not within the Environment Industry database/definition.

The result of this work is that the part of the Environment Industry database containing enterprises and the part containing establishments are mainly, but not exactly the same. Since establishment is a smaller and therefore more specific unit than enterprise, establishment is used where possible. Data about employees and geographical location is possible to describe for establishments.

There are 10 571 establishments in the Environment Industry database, 2 882 of these are within the core industries. Outside the core industries there are only two NACE codes containing more than 1 000 establishments within the environment industry, "Construction" and "Other business activities" According to environmental business activity, the largest groups are "Waste management", "Sustainable agriculture" and "Indoor air pollution control".

More than 60 per cent of the establishments are identified as primary environment industry. The other establishments are classified as secondary, producing multi-purpose products or not finally defined.

Status of establishments divided after classes

Code	Environmental activities	Primary establishments	Other categories	No class.	Total
A	Pollution Management	3525	1400	0	4925
A1	Air pollution control	55	4	0	59
A2	Wastewater management	676	64	0	740
A3	Solid waste management	2371	342	0	2713
A4	Remediation and clean-up of soil, surface water and ground water	12	72	0	84
A5	Noise and vibration abatement	3	17	0	20
A6	Environmental monitoring, analysis and assessment:				
A6a	Environmental R&D	6	16	0	22
A6b	Education, training and information	58	196	0	254
A6c	Analytical services, data collection, analysis and assessment	344	689	0	1033
B	Cleaner Technologies and Products	233	183	0	416
B1	Cleaner/resource-efficient technologies and processes	92	123	0	215
B2	Cleaner/resource-efficient products	141	60	0	201
C	Resource Management	2602	1828	0	4430
C1	Indoor air pollution control	19	1432	0	1451
C2	Water supply	659	12	0	671
C3	Recycled materials	150	56	0	206
C4	Renewable energy plant	262	195	0	457
C5	Heat/energy saving and management	429	70	0	499
C6	Sustainable agriculture and fisheries	1069	24	0	1093
C7	Sustainable forestry	0	10	0	10
C9	Eco-tourism	8	9	0	17
C10	Other	6	20	0	26
X	No classification for Environmental activity	0	410	390	800
Grand total		6360	3821	390	10571

5.4 Employees

The employees are shown for establishments since establishment is the most specified unit in this study. The total number of employees in 1998 in establishments in the Environment Industry database was 94 907. The largest NACE code according to employees were "Other business activities" (74) with nearly 16 000 employees. A lot of the establishments listed under this NACE code are environmental consultants. The second largest group was "Construction" (45) with over 13 500 employees, which is more than the core industries all together. Other large groups were "Manufacture of machinery" (29) with over 7 000 employees and "Electricity, gas and hot water supply" (40) with nearly 7 000 employees.

Number of employees by NACE code 1998

NACE		Number of employees
25120	Retreading	718
37	Recycling of metal waste and scrap	754
51570	Wholesale of waste and scrap	2469
90	Sewage and refuse disposal, sanitation and similar activities	9107
Total Core branches		13048
01	Agriculture, hunting and related service activities	570
02	Forestry, logging and related service activities	415
05	Fishing, operation of fish hatcheries and fish farms	34
10	Mining of coal and lignite; extraction of peat	11
14	Other mining and quarrying	121
15	Manufacture of food products and beverages	1052
17	Manufacture of textiles	530
19	Tanning and dressing of leather	0
20	Manufacture of wood and of products of wood and cork	648
21	Manufacture of pulp, paper and paper products	3140
22	Publishing, printing and reproduction of recorded media	1476
23	Manufacture of coke, refined petroleum products and nuclear fuel	12
24	Manufacture of chemicals and chemical products	1453
25 excl 25.120	Manufacture of rubber and plastic products	639
26	Manufacture of other non-metallic mineral products	1825
27	Manufacture of basic metals	95
28	Manufacture of fabricated metal products	2498
29	Manufacture of machinery and equipment n.e.c.	7258
30	Manufacture of office machinery and computers	0
31	Manufacture of electrical machinery and apparatus n.e.c.	121
32	Manufacture of radio, television and communication equipment	0
33	Manufacture of medical, precision and optical instruments	1801
34	Manufacture of motor vehicles, trailers and semi-trailers	386
35	Manufacture of other transport equipment	1
36	Manufacture of furniture; manufacturing n.e.c.	237
40	Electricity, gas, steam and hot water supply	6937
41	Collection, purification and distribution of water	2171
45	Construction	13546
50	Sale, maintenance and repair of motor vehicles and motorcycles	2679
51 excl 51.570	Wholesale trade and commission trade	4533
52	Retail trade, except of motor vehicles and motorcycles	948
55	Hotels and restaurants	62
60	Land transport; transport via pipelines	997
61	Water transport	20
62	Air transport	37
63	Supporting auxiliary transport activities; activities of travel agencies	687
64	Post and telecommunications	45
65	Financial intermediation, except insurance and pension funding	52
67	Activities auxiliary to financial intermediation	12
70	Real estate activities	1157
71	Renting of machinery and equipment without operator	48
72	Computer and related activities	288
73	Research and development	1204
74	Other business activities	15822
75	Public administration and defence; compulsory social security	1261
80	Education	4533
85	Health and social work	191
91	Activities of membership organizations n.e.c.	160
92	Recreational, cultural and sporting activities	100
93	Other service activities	29
.	No classification in NACE	17
Total non-core branches		81859
Total (incl. core branches)		94907

Finally the employees were also divided into environment industry classes. The largest class according to number of employees was "Indoor air pollution control" with more than 17 500 employees. A lot of the establishments in this group has NACE code "Construction". By dividing the establishments both by NACE code and environment industry class, the description can be more specified.

The second largest class according to number of employees is "Solid waste management" with 17 300 employees. Over 12 100 employees were found in the class "Analytical services, data collection, analysis and assessment". Many of these establishments are also found under the NACE code "Other business activities" (74).

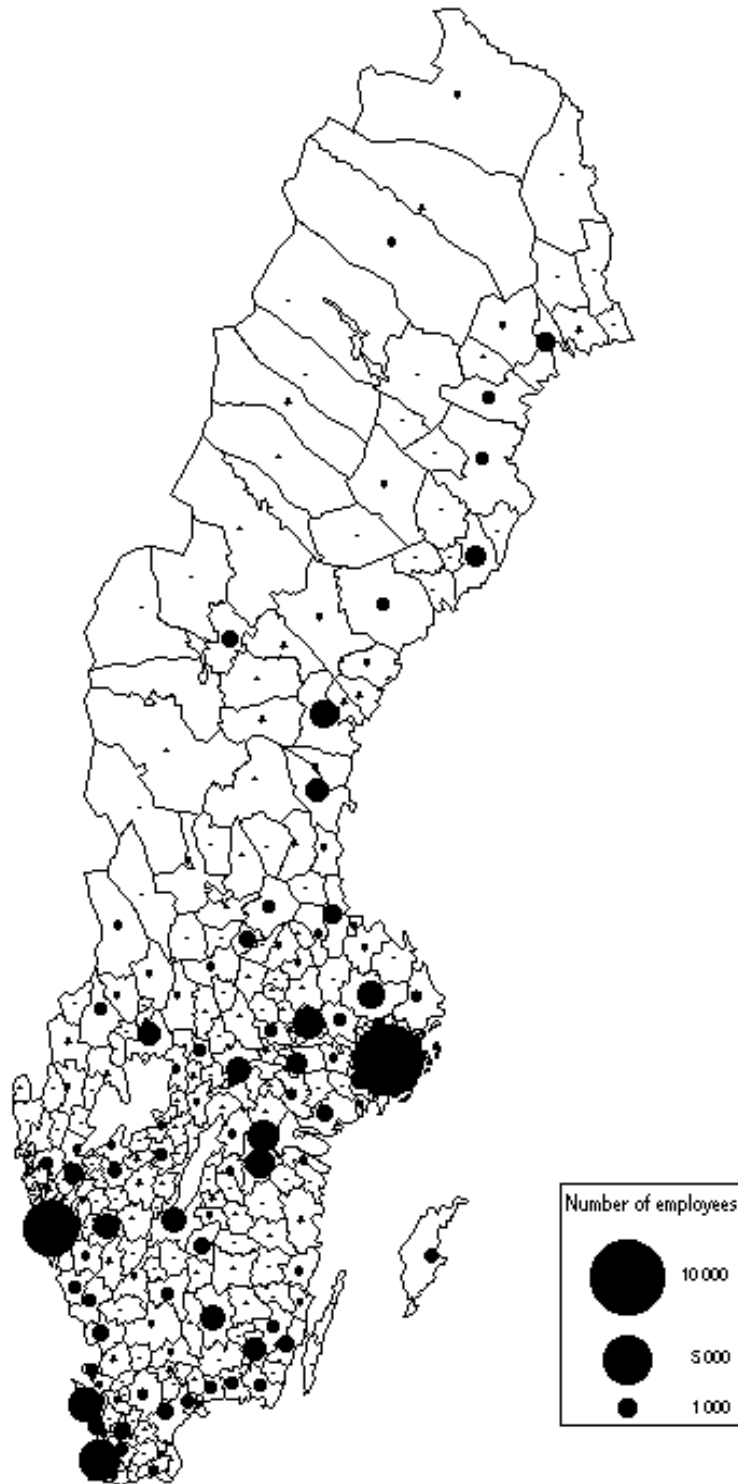
Number of employees divided after environment activity 1998

Code	Environmental activities	Number of employees
A	Pollution Management	42016
A1	Air pollution control	1285
A2	Wastewater management	5154
A3	Solid waste management	17321
A4	Remediation and clean-up of soil, surface water and ground water	891
A5	Noise and vibration abatement	221
A6	Environmental monitoring, analysis and assessment:	
A6a	Environmental R&D	164
A6b	Education, training and information	4824
A6c	Analytical services, data collection, analysis and assessment	12156
B	Cleaner Technologies and Products	5451
B1	Cleaner/resource-efficient technologies and processes	2555
B2	Cleaner/resource-efficient products	2896
C	Resource Management	38812
C1	Indoor air pollution control	17578
C2	Water supply	2564
C3	Recycled materials	4707
C4	Renewable energy plant	6981
C5	Heat/energy saving and management	4029
C6	Sustainable agriculture and fisheries	2612
C7	Sustainable forestry	8
C9	Eco-tourism	31
C10	Other	302
X	No classification of Environmental activity	8628
Grand total		94907

5.5 Geographical spreading

Data from the Swedish business register makes it possible to show the geographical spreading of the employees (in establishments) within the Environment Industry database. The map below shows the number of employees per municipality in Sweden. There is a concentration of employees in Stockholm and other larger cities. This, of course, goes for the labour market as a whole as well, but the concentration is not really as strong as for the total labour market. In a future work, the geographical spreading will be further analysed for example according to environmental activity within the environment industry.

Number of employees in the environment industry after municipality 1998



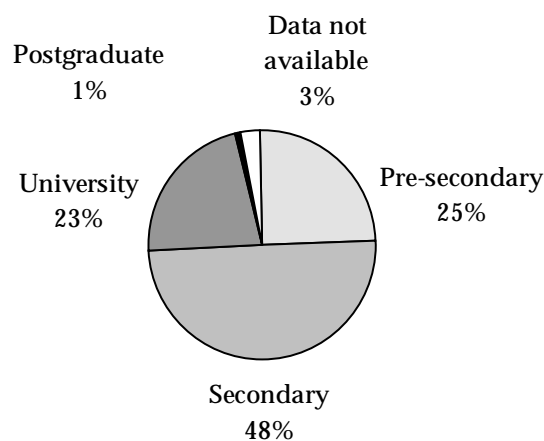
5.6 Level of education

Data about the level of education is of interest when looking at the environment industry as a source for new jobs. It has been suggested that new, low skilled jobs can be found within the environment sector. In the previous study²⁷ the core industries were examined according to level of education. That study showed that the level of education for the core industries was lower than on the labour market as a whole. The present study makes it possible to look at the level of education for employees at all establishments in the Environment Industry database maintained in this work.

The Louise-database is developed from register data at Statistics Sweden. The purpose is to utilise existing register data combining areas of education, labour market and income. The database includes all persons over 16 years of age. It also includes data that links persons (social security number) with the establishments from which they have had an income. Using this database it is possible to describe the employees at the establishments within the environmental industry according to for example level of education, former unemployment and income.

The establishment part of the Environment Industry database was linked to the Louise register through the establishment number. Then data were obtained about the employees in the environment industry (in 1997). Because the Environment Industry database contains data about establishments in 1999 and the number of employees in the Swedish business register refers to data collected for tax purposes for the year 1998, only 85 496 persons were found in the Louise database. This is to be compared with 94 907 employees in the Environment Industry database in 1998. About 10 per cent of the employees are missing, mainly because the different times for measuring.

Level of education, employees within the environment industry 1997



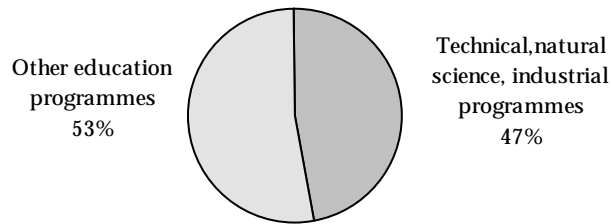
5.7 Line of education

In order to examine what skills could be demanded from employees in the environment industry, the line of education was divided into "Technical, nature science and industrial programmes" and "Other education programmes". The result was, not surprisingly, that the

²⁷ EUROSTAT 2/1999/B/3 (1999). The Environmental Industry in Sweden

”Technical, nature science and industrial programmes” were far more common among employees within the environment industry, than on the labour market as a whole.

Line of education, employees in the environment industry 1997



More in depth studies about level of education and line of education among employees in the environment industry are possible and will be done in a future study.

6 Future work

This study has generated an Environment Industry database, containing environment producers; enterprises and establishments. The Environment Industry database contains both the producers within the environment core industries and identified environment producers outside the core industries. This line of work started with a study in 1998 and is continued in this report. However the Environment Industry database needs further improvement. There is also a need for further analysis of the existing data in the Environment Industry database.

A lot of work has been done to identify enterprises and establishments that falls under the definition of environment industry. Still there are some aspects waiting to be further improved and examined, in order to get the Environment Industry database as complete as possible. One area that needs further examination is the environment part (often secondary) in large enterprises like Volvo, ASEA and SKF. The Environment Industry database contains only register data. In order to improve the existing information, especially about environment industry class and status of specialisation, it would be of great interest to conduct survey studies. This would also be essential for better estimates of the share of environmental turnover in the total turnover. The information about business activity is only available in some of the used sources and there is a great need for complementary information about this. The existing Environment Industry database could be used as a sample frame for surveys in the environment area.

It would be very useful if the Swedish Business Register could contain a description of Business activity for all enterprises. If that was possible, it would open lots of possibilities to analyse the economy and labour market in new dimensions. The basic problem when examining the environment industry, or other "new" industries is that the NACE -code system is not specific enough and changes much more slowly than the economy does. If these descriptions were available in the Swedish Business Register, it would be possible to find producers in any area through key words. This would make the information system much more useful, not only when examining the environment industry, but when new lines of products or production takes place. Another new area of interest in Sweden which is difficult to examine through the ordinary registers are ethic enterprises, dealing in ethical production and trade.

Another area that needs further examination is the growing market for eco-labelled products besides food, for example cleaning products for household use. In Sweden, most of these products are eco-labelled and it would be of interest to incorporate these producers into the Environment Industry database

In a future study that will be conducted in 2000, the environment industry will be further analysed according to turnover, export, education and unemployment. This will be done for different environment activities as well as for NACE codes.

The Environment Industry database could also be used in order to facilitate for environment producers and customers to find one another. There are examples on the Internet where databases containing environment producers are published for market purposes. Also the European Commission has established such a database.

7 Literature

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