



Producers of Environmental services

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1 Introduction

This report is prepared on commission from EUROSTAT, who support and co-ordinates development of environmental accounts in the EU member states. The European commission (DGXI) has contributed financially to the project.

Statistics on producers of environmental services, enterprises under the SNI-headings (SNI is the same as NACE but with a last digit added) 37, 51.57 and 90, is a part of traditional economic statistics today and therefore of importance both to the division responsible for the Business register and to the division responsible for services sector data at Statistics Sweden. At the same time, the producers statistics are important from the point of view of environmental statistics in areas such as:

1. Environmental Protection Expenditure

As far as expenditure data is concerned, the main interest is on principal waste management activities under SNI 90 and secondary waste management activities under SNI 37 and 51.57. Key variables are gross investment and turnover.

Existing data on producers has not yet been used as environmental expenditure input. It is important to integrate this source with the existing sources on expenditure for waste management in order to avoid double counting.

2. The Environment Industry

These branches make up the core of the so-called environment industry, which is of considerable political interest today, but for which very little statistical information is available. The exceptions are the producers of environmental services of which regular surveys are carried out. From the point of view of the environment industry, the key variables consist of number of enterprises, number of employees and turnover.

3. Waste Statistics

As regards waste statistics, the main interest lies in accurate classification, in order to provide a basis for independent waste surveys.

Although data exists on the SNI-headings 37, 51.57 and 90 today, it has been developed for other purposes than those of the environmental statistics described above. These activities may well be of limited interest in terms of economic statistics, moreover. It is also clear that inaccuracies exist among the classifications in the Business register.

1.1 Objective

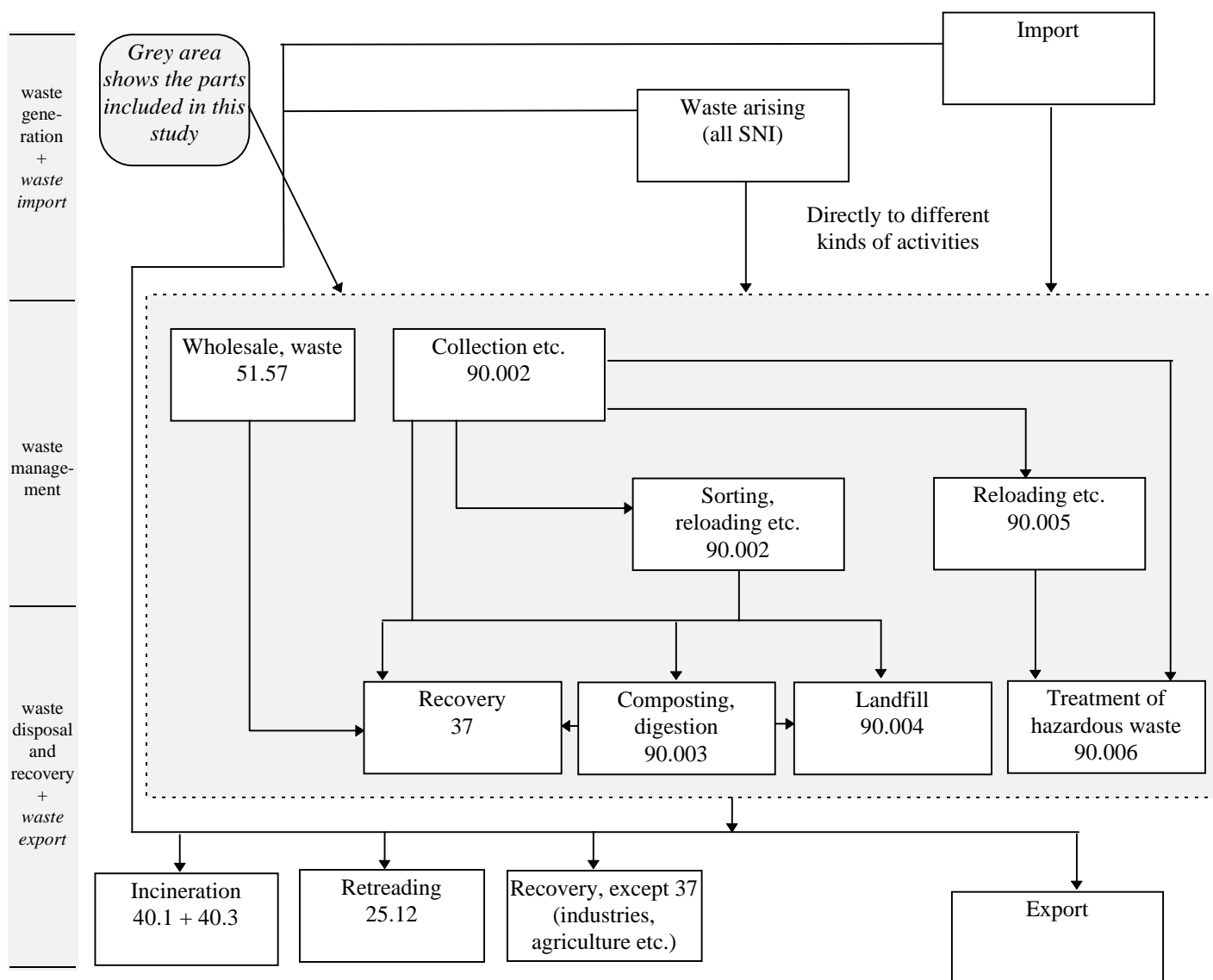
The objective of this project is to arrive at proposals for different ways of obtaining adequate data on producers of environmental services, while satisfying the needs of different statistical fields. The output from the study would then form the basis for future follow-up work, where concentration will lie on improving existing data. This study include an analysis of existing data in the different branches aimed at providing a separate account of data with key economic variables such as number of enterprises, number of employees, turnover and investments. Another objective is to describe the problems involved in using existing data for e.g. as regards definitions and classifications.

1.2 Structure of the report

In section 2, a description of the waste flow is made, and how the different actors in waste management interacts in this flow. Section 3 provides an account of the sources upon which statistical reports might be based. Section 4 begins with a compilation of important data by branch. Then there is a detailed analysis of the statistics for each branch, with a special focus on different problems associated with the application and interpretation of the statistics. There are also proposals on what material future data presentation should be based, and the measures that should be taken in order to implement these proposals.

2 Waste flows in the society

The core branches studied in this report are often closely linked with one another. A company or facility may also work in a number of the operations studied, i.e. could be classified as several of the SNI-codes. Waste, which is a significant factor in these contexts, is transported between the different players. The following figure provide an overview of the waste flow between the different activities classed in accordance with SNI. This may be seen as a background information when different results in the study are presented.



90.007 Other waste management
90.001 Waste water treatment
90.008 Street cleansing etc.

What part of the waste scheme above that 90.007 belongs to is not analysed, due to the undefined name of the sector. 90.007 is part of the study. Also 90.001 and 90.008 are included in the study, but not in the waste scheme - the activities they are involved with does not include waste in the same sense as above.

Those boxes/activities within the grey area are included in this study. Included are not the top boxes representing the production of waste. Activities dealing with different types of waste management (collection, sorting etc.) are included. Some of the branches of waste treatment

are included, but some are left out - waste incineration where the energy are recovered (SNI 40), retreading (SNI 25.12) and recovery not classified as SNI 37. This may for example be recycling of bottles where the bottles are directly sent back to the producer or use of sludge in the agriculture sector.

3 Sources

This section describes some of the existing Statistics Sweden registers and surveys, together with other sources that can be used for information on the branches concerned. It includes a description of the sources and comments on future work. The description of sources is partly based on material in the EU report entitled *The Environment Industry in Sweden*.

3.1 Statistics Sweden's Business Register

The Business register contains all the companies and establishments in Sweden which conduct any form of economic activity, regardless of whether they are in private or public ownership. Once a fortnight, Statistics Sweden receives new registrations from the Swedish Patent and Registration Office, information from the National Taxation Authority and the Register for value added tax (VAT) and changes of address from the company that handles these changes.

Companies and establishments have unique identification numbers (company registration numbers) which are used in registers and surveys for company statistics. The establishments have the Business register numbers to identify them. The register also contains activity codes pursuant to the SNI classification. This means that information is available from the Business register on the branches included in this study. Examples of such information include company size (number of employees), geographic code, legal form and number of establishments.

In this report, we have drawn information from the Business register on the number of companies, number of establishments, legal form, etc. It is possible to analyse the number of companies that focus on the core branches 37, 51.57 and 90, as well as the main operations of these companies' establishments and vice versa.

According to the report *"The Environment Industry in Sweden"* there were a total of 12 808 employees in 1996 at establishments whose main operations were within the mentioned core branches. Approximately 2/3 of these were employed in companies with primary activity in the branches and the remaining 1/3 were employed in companies with some other primary activity, but at establishments that were primarily occupied with one of the mentioned core branches. The latter mainly consisted of local authority operations where the "company" is a local authority and the establishment is a sewage treatment plant, for example. In such cases, the company is not sufficiently specific as a basis for delineation. However, it is the smallest unit for which turnover data is available.

In order to gain a background to the statistics relating to local authority operations in the field, the updating of the Business register of data on companies, establishments and municipalities is described here. This affects the SNI coding of the local authorities and of the establishments in the municipalities.

Updating of the Business register.

- Once annually, the Business register questionnaire is circulated among all local authorities (twice a year to other companies with multiple establishments). In this questionnaire, the

company (local authority) is asked to amend, add or reduce the number of establishments shown in the previous year's list.

- Companies with few employees get this questionnaire more seldom.
- Descriptions must be provided of operations at new establishments and changes in existing ones. The approximate number of hours worked are to be stated for the different activities (this applies to local authorities, other companies must show turnover by the different activities).
- At Statistics Sweden, the activities are translated to SNI codes on the basis of the operational descriptions. The SNI code is the same as NACE, but with a last digit added. The primary activity in terms of number of hours is given the first SNI code and if there are further activities at an establishment, the SNI codes are allocated in accordance with the size of operations, i.e. the secondary code goes to the second largest operation.
- Some local authorities do not show the number of hours per activity (voluntary information). The Business register then uses a standardised formula that states that if there are two types of activity, the largest has 80% and the smallest 20%; for three, the proportion is 60, 30, 10%.
- Neither the percentages provided by the local authorities nor the standard formula are stated at establishment level in the Business register, partly because of the uncertainty, partly in the light of changes at the local authorities during the year.
- The figures provided by the local authority, plus the standardised figures for the establishments are, however, used by the Business register in order to work out the company's different SNI codes on the basis of computational models, from the first level down to a maximum of five SNI code levels, with percentages for each level.
- Although all five SNI levels may be stated for the company, the percentages of the SNI codes do not necessarily add up to 100%, since the company may include other activities.

The procedure to update and classify the municipalities in the Business register gives often a main activity classification within the health-care sector, due to the large part this sector represent in the municipalities. Nevertheless almost all municipalities have some establishments working within the core branches. Economic data up to 1996 only exists on company level, in the case of municipalities for the authority as a whole. Some economic data at the municipalities are separate account for, for example waste management, and could be used in statistics of environmental activities.

3.2 Register for value added tax (VAT)

The survey includes companies that are required to pay VAT to the tax authorities and which have a turnover of more than SEK 200 000 (more than SEK 1 000 000 as of 1996). VAT is levied on taxable goods or services inside Sweden which may be regarded as commercial activities. This is the prime rule for VAT on goods and services. VAT liability also exists on:

- Taxable acquisition of movable property between municipalities, "movable tangible property"
- Taxable import of goods
- Taxable purchases of certain services from foreign entrepreneurs (import of services)

The VAT register includes information about turnover in Sweden and turnover of goods and services to other countries for companies that are required to pay VAT in Sweden.

Unfortunately, there is no link to establishments – it is only possible to obtain turnover for companies via the SNI codes or company registration numbers.

As table 1 shows, there are certain differences in the number of companies between the Business register and the VAT register. This is attributable to the fact that the VAT register does not contain small low-turnover companies, while the Business register contains all companies in Sweden that conduct economic operations. Another explanation of the difference is that restructuring, new companies and closures are registered at different points in time.

Table 1. Enterprises in the Register for VAT 1997 versus in the Business Register 1997

| SNI | Number of enterprises in the VAT Register | Number of enterprises in the Business Register |
|--------------|--|---|
| 37.1 | 70 | 78 |
| 37.2 | 43 | 46 |
| 51.57 | 641 | 913 |
| 90.001 | 43 | 52 |
| 90.002 | 273 | 285 |
| 90.003 | 10 | 11 |
| 90.004 | 9 | 10 |
| 90.005 | 18 | 20 |
| 90.006 | 16 | 12 |
| 90.007 | 52 | 56 |
| 90.008 | 190 | 315 |
| Total | 1 365 | 1 798 |

3.3 Database founded on the employment and education register

This database has been designed for analyses and forecast in the interface between education and the labour market. It is based on data drawn from the education register and employment register at Statistics Sweden which have been linked together. It contains data on the population of working age, linked to employment via establishments. The register is currently updated to 1995, but 1996 information will soon be available. This allows data to be obtained on where people with environmental training work, as well as comparisons with the IT industry and breakdown per sector, etc. Figures are presented in section 3.1.5 in the report "The Environment Industry in Sweden".

3.4 The Louise database

This database was developed in order to link existing database information for several sectors of society, particularly education, the labour market and welfare. Louise is a Swedish acronym for 'longitudinal database for education, income and employment'. The database currently contains data between 1990 and 1996. All people aged 16-64 are included up to and including 1994. For 1995 and 1996, all over 64 are also included. Educational information can be obtained from this database for 1996 for people who are employed at all the establishments included in this study. Information can also be produced on how many of the employees have

been unemployed or involved in any labour market scheme in 1994, 1995 and 1996. Figures see the report "The Environment Industry in Sweden".

3.5 Financial accounts for enterprises

Financial statistics are drawn up annually. These contain data on all SNI branches. As of 1997, the statistics are directly co-ordinated with manufacturing statistics and are gathered jointly. The statistics are based on an overall questionnaire survey of companies with more than fifty employees. Companies with fewer employees are surveyed with the help of standardised financial statements. The companies are drawn up with the help of the Business register. The survey includes limited liability companies, economic associations, trading companies and partnerships. These include municipal corporations and public utilities. Only the non-financial companies are studied.

This means that the financial accounts include information on the core branches:

- 37.1 Recycling of metal waste and scrap
- 37.2 Recycling of non-metal waste and scrap
- 51.57 Wholesale of waste and scrap
- 90 Sewage and refuse disposal, sanitation and similar activities

The companies that provide information via a questionnaire submit excerpts from statements of income and balance sheets. Variables include payroll costs, value added, turnover, operating expenses, depreciation, state and local authority grants, financial revenue, financial expenses, net investments and net profit. It is possible to obtain information for these companies via the SNI code or via their registration number. As of 1997, moreover, some economic data can be obtained for kind of activity units (KAU). The KAU groups all the parts of an enterprise contributing to the performance of an activity at class level (four digits) of NACE Rev 1 and corresponds to one or more operational subdivisions of an enterprise.

If various important items of information are to be drawn from the final accounts, the operational unit must be of significant importance to the branch for which data is gathered. The following criteria have been established in conjunction therewith:

- the unit should have more than 50 employees
- or the number of employees in the activities concerned should exceed 1% of the total number of employees in the branch

For each KAU, data will be provided for production value, intermediate consumption, labour costs, operating surplus, employment and gross fixed capital formation.

3.6 Manufacturing statistics

Up to 1996, manufacturing statistics include all establishments in industrial enterprises (SNI 10-37) with ten or more persons occupied. This means that we can obtain detailed information on the core branches.

- 37.1 Recycling of metal waste and scrap
- 37.2 Recycling of non-metal waste and scrap

Information can be obtained for these branches according to a number of variables, such as:

- Number of establishments
- Income
- Expense
- Employment
- Working hours
- Income of non-industrial activities
- Salary to wage-earners, salaried employees, other
- Employer's contributions

As of the 1997 statistics, this information has been co-ordinated with financial accounts, which means that further information will be obtained for a larger population (see 3.5).

3.7 Local authority finances

Statistics Sweden provides annual statistics on local authority finances. These are based on information from the final accounts of the majority of authorities. The data are gathered via a questionnaire which makes it possible to present the information according to activity and according to income/expense category. The most recent survey available is for 1997. This also included data on the companies owned by the local authorities. These are taken to mean companies in which one or more local authorities have a decisive influence. The financial information is drawn from company tax returns. These contain detailed statements of income and balance sheets. The local authority financial statements include information on expenses and income for environmental protection unit, water supply and sewage treatment (linked data) and waste management. Amongst other things, this includes the following expenses: salaries, external goods, external services and grants, cost of premises and facilities – with capital costs shown separately. Income includes external charges, external rental income for accommodation and premises, other external income, internal income. Capital expenditure outlay and costs are also shown.

3.8 Swedish Association of Water and Sewage Authorities

The Swedish Association of Water and Sewage Authorities (VAV) conducts an annual questionnaire survey of all local authorities. The survey gather both "physical" and economic information. Examples on physical data are how many people are connected to water and sewage systems and consumption of water. Economic data includes production costs, distribution costs, administrative costs and capital costs, as well as the cost of new facilities and re-investment. The most recent VAV information is for 1995. Since the questionnaire targets all local authorities, regional presentations are possible. The data cover all activities associated with the local authority. This means that municipal corporations and associations are included. As of 1995, most local authorities have been providing data in accordance with a special operating cost project. This has facilitated cost follow-up.

4 "Producers by sector"

The following is a review of the branches covered by the study, with data from the above-mentioned sources and comments on comparability and quality. The possibility of using existing sources for generating future statistics is also discussed, together with other

alternatives for obtaining good information about a particular branch. In table 2, there is a presentation by branch of important economic variables.

Table 2. Enterprises, employment turnover and netinvestments in some core industries

| SNI | Number of enterprises in the Business register, 1997 | Number of employees in the Business register, 1997 | Turnover in the VAT register 1997, Million SEK | Netinvestments¹ in the Financial Accounts 1996, Million SEK |
|--------------|---|---|---|---|
| 37.1 | 78 | 512 | 1 258 | 303 |
| 37.2 | 46 | 218 | 1 255 | 370 |
| 51.57 | 913 | 2 500 | 6 076 | 211 |
| 90.001 | 52 | 2 040 | 781 | 164 |
| 90.002 | 285 | 5 048 | 4 291 | 576 |
| 90.003 | 11 | 5 | 15 | 6 |
| 90.004 | 10 | 114 | 76 | 6 |
| 90.005 | 20 | 434 | 723 | 45 |
| 90.006 | 12 | 168 | 98 | 22 |
| 90.007 | 56 | 170 | 267 | 47 |
| 90.008 | 315 | 1 440 | 511 | 25 |
| Total | 1 798 | 12 649 | 15 351 | 1 775 |

1) Net capital expenditures consist of gross capital expenditures less sales

The figures for SNI 90 do not include primary municipalities, but for number of employees which are based on statistics about establishments. Companies belonging to the municipalities are included in the figures.

4.1 The recycling industry

4.1.1 Introduction

Recycling statistics are available for the number of companies, employees, gender distribution and education level from

- the Business register
- the VAT register
- employment register
- education register

Economic data are available from

- manufacturing statistics
- financial accounts
- the VAT register

Recycling pursuant to SNI 37 is divided into SNI 37.1 Recycling of metal waste and scrap and SNI 37.2 Recycling of non-metal waste and scrap. One characteristic of SNI 37, Recycling, is that the input goods consist of scrap metal and waste – separated or unseparated – which is not suitable for further industrial processing. The end product after recycling, however, is suitable for processing and can be regarded as semi-manufactured goods. The definition means, for

example, that recycling in a production unit in different branch which is used in its own production process does not constitute an operation under SNI 37.

The following activities are not defined as recycling:

- re-smelting of spill at foundries – foundry operations
- reuse of sawdust in chipboard manufacture – timber product manufacture
- manufacture of thread from waste textile material – textile manufacture
- production of pulp from recycled paper – pulp manufacture
- retreading of tyres – rubber manufacture

Discussing the recycling industry it is very important to take account of the payment flows. Then you have to consider the following.

The recycling industry is occupied with two different activities:

- providing waste management services to others which should be classified as secondary activity (SNI 90). Data for this activity measures waste management services and is needed for waste management statistics.
- processing the waste in order to obtain recycled raw materials or parts for further processing or other applications

As regards the waste received, it is the economic conditions for the deliveries that determine whether it should be considered as a debit or a credit item.

1. If the company receives payment for the waste it receives (or receives it free of charge) the amount constitutes payment for the service of receiving waste and must be shown as a credit item under the production of waste management services.
2. If the company pays for the waste it receives, the waste constitutes input goods and is to be shown as a debit item under consumption of purchased goods.

Payment in conjunction with the delivery of waste to a recycling company can thus be seen as the net between two transactions. It is important to identify this streams because of the needs to get reliable data when you present environment protection expenditure statistics.

4.1.2 Identification of producers in SNI 37.1 and 37.2

To be able to identify all the producers who have been classified as 37, you have to see in which branches you find this activity. The following three tables show branches 37.1 and 37.2, how many establishments in accordance with the Business register have these branches their primary or secondary SNI, what the secondary SNI is, and which branches have them as secondary branch. The information is from 1996.

Table 3. Number of establishments that have 37.1 and 37.2 as primary or secondary SNI, 1996

| SNI | Designation | Number of establishments which have as: | | |
|-----------|--|---|---------------|-----------|
| | | Primary SNI | Secondary SNI | Third SNI |
| 37.1 | Recycling of metal waste and scrap | 85 | 8 | 4 |
| 37.2 | Recycling of non-metal waste and scrap | 53 | 4 | 1 |
| 37 | Recycling | 108 | 12 | 5 |

Of the establishments which are primarily or secondarily classed in the Business register as SNI 37, there are only four SNI 37.1 and one SNI 37.2 with at least twenty employees. This could be a problem. As said in section 3.1 classifying companies in the Business register with few employees is not done regularly.

Table 4. Number of establishments that have secondary branches 37.1 and 37.2, 1996

| SNI | Designation | 37.1 | 37.2 |
|--------------|---|----------|----------|
| 37.1 | Recycling of metal waste and scrap | | 2 |
| 37.2 | Recycling of non-metal waste and scrap | 1 | |
| 40.3 | Steam and hot water supply | 1 | |
| 51.57 | Wholesale of waste and scrap | 3 | 1 |
| 90.007 | Other waste management | | 2 |
| 90.008 | Street cleansing, other sanitary management | 1 | |
| Total | | 6 | 5 |

Table 5. Number of establishments that have 37.1 and 37.2 as secondary activity, 1996

| SNI | Designation | 37.1 | 37.2 |
|--------------|--|-----------|----------|
| 25.12 | Shaping and processing of flat glass | 1 | |
| 25.21 | Manufacturing of ceramic household and ornamental articles | | 1 |
| 27.42 | Aluminium production | 1 | |
| 27.51 | Casting of iron | 1 | |
| 31.501 | Manufacture of lamps and lighting fittings | | 1 |
| 35.11 | Building and repairing of ships | 1 | |
| 37.1 | Recycling of metal waste and scrap | | 1 |
| 37.2 | Recycling of non-metal waste and scrap | 2 | |
| 70.202 | Letting of industrial premises | 1 | |
| 72.1 | Hardware consultancy | 1 | |
| 74.702 | Disinfecting and exterminating activities | | 1 |
| 90.002 | Collection, sorting and reloading of non-hazardous waste | 4 | 1 |
| Total | | 12 | 5 |

4.1.3 Public and private enterprises/establishments

The information is based on enterprises/establishments in the Business register, i.e. financial and manufacturing statistics distributed with the help of existing data over the private and public sectors respectively. The statistics show that there are no public enterprises in this branch.

4.1.4 Other administrative data

Information on where to find data on annual income, employment, etc., that is available via the employment and education register and the Louise database can be seen in sections 3.3 and 3.4.

4.1.5 Economic data

Interesting economic statistics are available for the area, both via manufacturing statistics and via financial accounts that present the economic status of enterprises.

The following table shows data from manufacturing statistics, 1993-1996. Data for 1997 will be presented during spring 1999.:

Table 6. Establishments, employees and financial variables 1993-1997

| SNI | Variable | 1993 | 1994 | 1995 | 1996 |
|------------|--------------------------|-------------|-------------|-------------|-------------|
| 37.1 | Number of establishments | .. | .. | 12 | 14 |
| | Number of employees | .. | .. | 341 | 358 |
| | Operating income, MSEK | .. | .. | 728 | 772 |
| | Operating expenses, MSEK | .. | .. | 573 | 685 |
| | Added value, MSEK | .. | .. | 265 | 208 |
| 37.2 | Number of establishments | .. | .. | 6 | 7 |
| | Number of employees | .. | .. | 100 | 127 |
| | Operating income, MSEK | .. | .. | 141 | 228 |
| | Operating expenses, MSEK | .. | .. | 126 | 176 |
| | Added value, MSEK | .. | .. | 41 | 87 |
| 37 | Number of establishments | 11 | 13 | 18 | 21 |
| | Number of employees | 248 | 416 | 441 | 485 |
| | Operating income, MSEK | 428 | 636 | 869 | 1 000 |
| | Operating expenses, MSEK | 333 | 510 | 699 | 861 |
| | Added value, MSEK | 168 | 243 | 306 | 295 |

N.B! SNI 37 was not divided into 37.1 and 37.2 until 1995.

The table 6 shows that the branch has, as expected, experienced rapid growth both in the number of employees and in economic terms.

As a background to a discussion on how the branch data should be presented in future, the following table has been produced. It shows the results of the 1996 manufacturing statistics,

and includes comparisons with the 1996 financial accounts, the Business register 1997 and the 1996 VAT register.

Table 7. Companies, establishments, and economic variables from financial accounts, manufacturing statistics, VAT and the Business register

| SNI | Variable | Financial accounts, 1996 | Manufacturing statistics, 1996 | VAT register, 1996 | The Business register, 1997 |
|------------|--------------------------|---------------------------------|---------------------------------------|---------------------------|------------------------------------|
| 37.1 | Number of companies | 45 | | 70 | 78 |
| | Number of establishments | | 14 | | 87 |
| | Number of employees | 394 | 358 | | 431 |
| | Operating income, MSEK | 694 | 772 | 1 243 | |
| | Operating expenses, MSEK | 617 | 685 | | |
| | Added value, MSEK | 201 | 208 | | |
| | Labour costs, MSEK | 124 | | | |
| | Net investments | 303 | | | |
| | | | | | |
| 37.2 | Number of companies | 27 | | 43 | 46 |
| | Number of establishments | | 7 | | 51 |
| | Number of employees | 132 | 127 | | 210 |
| | Operating income, MSEK | 1 113 | 228 | 1 117 | |
| | Operating expenses, MSEK | 1 023 | 176 | | |
| | Added value, MSEK | 126 | 87 | | |
| | Labour costs, MSEK | 32 | | | |
| | Net investments | 370 | | | |
| | | | | | |
| 37 | Number of companies | 72 | | 113 | 124 |
| | Number of establishments | | 21 | | 138 |
| | Number of employees | 576 | 485 | | 641 |
| | Operating income, MSEK | 1 807 | 1 000 | 2360 | |
| | Operating expenses, MSEK | 1 640 | 861 | | |
| | Added value, MSEK | 327 | 295 | | |
| | Labour costs, MSEK | 157 | | | |
| | Net investments, MSEK | 673 | | | |
| | | | | | |

From the VAT register, it is possible to obtain statistics concerning the export of goods and services from the branch. The export share of turnover in accordance with the VAT register was, in 1997, about 32% for 37.1 and about 4% for 37.2.

4.1.6 Problems and explanation of differences in the table

1. Cut -off limits

Statistics from financial accounts generally cover data from all non-financial enterprises. However, sole proprietors are not included.

Manufacturing statistics up to 1996 only show data for companies with more than 10 employees.

2. Survey unit

The survey unit in financial accounts is the company, i.e. the final accounting unit. This means that the financial statements are obtained for the company as a whole. Difficulties therefore arise in obtaining a comprehensive picture of the branch since, a company may operate in different branches. Among companies classed in the recycling industry, relatively few establishments are classed under a different branch. No estimate has been performed as to what proportion of the income statement items are attributable to these establishments. This also applies to cases where an establishment is classed as belonging to the recycling branch, but is in a company that is classed elsewhere

The survey unit in manufacturing statistics is the enterprise. Certain variables are broken down for the establishments within the company. Industrial data concerning a company's financial statements is from 1997 included in financial accounts.

3. Variables

A Gross expenditure

Only net capital expenditure is shown in the financial accounts. The gross capital expenditure data are considered to be of such poor quality that they should not be published. Gross capital expenditure is defined as net capital expenditure plus sales. Information on sales is not fully comprehensive for companies of less than 50 employees. Discarded assets are valued according to different methods, moreover.

B Number of employees

The financial statistics present the average number of employees during a financial year. However, special estimates are made for certain companies which means that there is some uncertainty in the stated data. The Business register bases the number of employees on taxable income statements. This variable refers to a particular occasion during the year.

C Operating income

The financial accounts and the VAT register use different definitions of turnover. In the VAT register, for example, divestment of fixed assets may be included. Moreover, incorrectly classified companies can be found in both surveys. The scope of this is not clear.

4.1.7 Conclusions and proposals

Depending on the source you choose, the data will differ. This depends on quite big differences in cut off limits, survey units and different definitions. The financial account gives quite relevant economic data. This statistics will be more useful after the presentation of the figures for 1997. To get a possibility to use statistics from financial accounts for figures about payment streams, the environment statistics is going to start a co-operation with the responsible for this statistics.

There is also a need to classify all establishments with the correct SNI. Otherwise the economic data for the branch will be misleading. The information in the VAT-register can then provide a point of reference in order to ensure that all establishments have correct SNI. The establishments which have been classified under recycling by the Business register will, in conjunction with the "new" company statistics, describe their operations with figures which will confirm that they come under recycling or result in reclassification. One might consider expanding the concept recycling to include new products made of scrap metal and waste throughout the manufacturing industry, the energy sector and construction.

An alternative to a questionnaire survey would be to compile a special register of companies and establishments classified under the branch concerned – in which, in addition to the Business register, the VAT register is also used as a source. In cases where a company consists of only one or more establishments classified as 37.1 or 37.2, information on the number of employees, number of companies and financial data are drawn from the data provided in conjunction with the "new" company statistics.

This means that information will not be obtained for certain establishments classed as 37.1 and 37.2 and which come under a company that is classified in a branch that is not included in the industry survey. There were, however, relatively few such cases (8) in 1996 and it ought not to be a need for special surveys on this establishments.

4.2 Wholesale trading in waste products and scrap metal

4.2.1 Introduction

Wholesale trading in waste products, etc., is a branch that has been relatively stable in recent years. Branch statistics can be obtained for the number of companies, employees and education from

- the Business register,
- VAT register
- employment register and education register.

Economic data can be obtained from

- financial accounts
- VAT register

4.2.2 Identification of producers under SNI 51.57

The following three tables show how many establishments exist in the branch according to the Business register and how many companies have this as their main or secondary SNI, which secondary SNI they have and which branches have them as their secondary branch. Data from 1996.

Table 8. Number of establishments with 51.57 as their main or secondary SNI, 1996

| SNI | Designation | Number of establishments which have as: | | |
|------------|------------------------------|--|----------------------|------------------|
| | | Primary SNI | Secondary SNI | Third SNI |
| 51.57 | Wholesale of waste and scrap | 1 012 | 65 | 8 |

Among the establishments that are classed primarily or secondarily as SNI 37 in the Business register, over 80% have fewer than 5 employees. This means that many establishments may have the wrong SNI, because it is not sure that SNI has been updated.

The register (the Business register 1996) shows that of those establishments which are classified as 51.57, is it only one establishment which is classified as 90.001 as secondary branch.

Table 9. Primary branches which have 51.57 as their secondary activity (number of establishments), 1996

| SNI | Designation | 51.57 |
|--------------|---|--------------|
| 01 | Agriculture, hunting and related service activities | 3 |
| 15 | Manufacture of food products and beverages | 1 |
| 20 | Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials | 2 |
| 21 | Manufacture of pulp, paper and paper products | 1 |
| 25 | Manufacture of rubber and plastic products | 2 |
| 29 | Manufacture of machinery and equipment n.e.c. | 1 |
| 35 | Manufacture of other transport equipment | 1 |
| 37 | Recycling | 4 |
| 40 | Electricity, gas, steam and hot water supply | 1 |
| 45 | Construction | 10 |
| 50 | Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel | 14 |
| 51 (not 57) | Wholesale trade and commission trade, except of motor vehicles and motorcycles (not Wholesale of waste and scrap) | 6 |
| 52 | Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods | 5 |
| 55 | Hotels and restaurants | 1 |
| 60 | Land transport; transport via pipelines | 7 |
| 70 | Real estate activities | 2 |
| 72 | Computer and related activities | 1 |
| 74 | Other business activities | 1 |
| 90 | Sewage and refuse disposal, sanitation and similar activities | 5 |
| 92 | Recreational, cultural and sporting activities | 2 |
| Total | | 73 |

4.2.3 Public and private enterprise/establishments

A breakdown according to legal form shows that few companies are owned by the public sector. The statistics of local authority finances in 1997 showed three municipal corporations in this branch. These are also found in the financial accounts.

4.2.4 Other administrative data

Information is available as described in sections 3.3. and 3.4.

4.2.5 Economic data

Economic data for this branch can be found in the financial accounts and the VAT register. *Table 10. Companies, employees and financial data from VAT, The Business register and Financial accounts in SNI 51.57*

| Variable | VAT register 1996 | The Business register 1997 | Financial accounts 1996 |
|--------------------------|-------------------|----------------------------|-------------------------|
| Number of companies | 641 | 913 | 484 |
| Number of establishments | | 1 077 | |
| Number of employees | | 431 | 394 |
| Operating income, MSEK | 5 814 | | 5 904 |
| Operating expenses, MSEK | | | 5 478 |
| Added value, MSEK | | | 1 075 |
| Labour costs, MSEK | | | 649 |
| Net investments | | | 211 |

It is also possible to obtain statistics from the VAT register on the export share of turnover, as for other branches covered by this study. In 1997, the export share for the branch amounted to approximately 17%. This figure has been relatively constant in recent years and corresponds to more than one-third of the total export value for all core branches.

4.2.6 Problems

The main difference between the number of companies that the financial accounts represent and the number of companies in the Business register is primarily attributable to the fact that the financial accounts do not include sole proprietors in their survey. A closer study of the Business register shows that about 45% of the establishments come under this form of ownership. The account of sources in section 3 explains some of the discrepancies between the VAT register and the Business register in terms of the number of companies.

The problems that arise in using the findings of the financial accounts have been described under the recycling branch.

Relatively few establishments in the waste wholesale branch has been classified with secondary activities in other branches. Information about these will, as of 1997, be available if they have been classified as an operating unit (see section 3.5).

4.2.7 Conclusions and proposals

As can be seen from the review of branch data, there are a number of establishments in the branch run by individual entrepreneurs. No economic data is currently available on these. As can be seen in section 5, however, the "new" common company statistics will make it possible to draw further economic statistics directly from existing surveys.

Financial accounts are a source of data gathered on an annual basis. Producers whose production in this branch is classified as secondary activity can be identified through the Business register, but no existing economic data have been produced. There are, however,

relatively few such establishments and it would be possible to obtain data through a targeted questionnaire to the companies that have this secondary activity. Alternatively, it would be possible to estimate the data by imputing the figures on the basis of companies that have, for example, about the same number of employees. Data about this few companies probably is of less importance and we propose that it will be seen as a falling off in the statistics.

4.3 Waste water treatment plants

4.3.1 Introduction

Local authorities have the overall responsibility for waste water and sewage operations. Some of these operations are handled by municipal corporations, associations and entrepreneurs. There is a weak trend towards the sale of such operations to private companies. However, most municipalities still want to own the activities they conduct.

Data on employees, number of establishments, etc., can be obtained from:

- Statistics Sweden's Business Register.
- The Employment Register System and the Register of Education, which provides information on employment and education

Economic data on waste water operations in Sweden can be obtained from the following sources:

- Local authority financial statements
- Financial accounts for enterprises
- Water and Waste water Management Association (VAV)
- VAT-register

A report entitled Adaptation of Swedish Data on Environmental Protection in the Public Sector to the SERIEE System, discusses and presents the data available from VAV up to 1994. This report also shows data obtained from the branch via the questionnaire survey at Statistics Sweden for operations in 1991. One of the proposals in the report is that one should look more closely at the possibility of using statistics from local authority accounts.

In the following, new data from VAV are presented together with an analysis of the problems associated with the interpretation of the data. The material is based on, among other things, interviews with those in charge at VAV and at a number of operations of this kind among local authorities. The latter are also those who provided data to VAV.

Local authority accounts have been used in this study for comparison with VAV in order to draw conclusions on how future statistics should be prepared.

4.3.2 Identification of producers in SNI 90.001

The tables 11 and 12 below show how many establishments exist in the branch according to the Business register and how many companies have this as their primary or secondary SNI and which branches have this as their secondary branch. The information is for 1996.

Table 11. Number of establishments that have 90.001 as main or secondary SNI

| SNI | Designation | Number of establishments which have: | | |
|--------|-------------------------|--------------------------------------|---------------|-----------|
| | | Primary SNI | Secondary SNI | Third SNI |
| 90.001 | Waste water- and sewage | 618 | 105 | 4 |

Table 12. Primary branches which have 90.001 as their secondary activities (number of establishments), 1996

| SNI | Designation | 90.001 |
|--------------|--|------------|
| 40 | Electricity, gas, steam and hot water supply | 3 |
| 41 | Collection, purification and distribution of water | 90 |
| 52 | Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods | 1 |
| 55 | Hotels and restaurants | 2 |
| 60 | Land transport; transport via pipelines | 1 |
| 70 | Real estate activities | 1 |
| 90 | Sewage and refuse disposal, sanitation and similar activities | 3 |
| Total | | 109 |

Many establishments are part of the municipal activities. The main activities may be something other than waste water. As mentioned earlier quite many companies in branch 41 has establishments within branch 90.001. By a closer look to the Business register you can find that there is a lot of misleading classifying as the activity is both waste water activity and water activity. The following table 13 shows that the branch is dominated by establishments with few employees.

Table 13. Number of employees in wastewater and sewage establishments by size class

| SNI | Size-class | | | | |
|--------|------------|-----|-------|-------|-----|
| | 0 | 1-9 | 10-19 | 20-49 | 50- |
| 90.001 | 181 | 468 | 45 | 26 | 3 |

The large number of establishments with nobody employed is probably attributable to the fact that the employees are registered under the company's main operations – in this case the local authority. It might also depend on the fact that the company (establishment) is owned by one person or sole traders which gives many establishments bot zero employees.

In Sweden, almost 90% of the population is connected to the local authority sewage plants. This means that the local authorities have comprehensive activities in this area.

Information from the Business register shows that about 85% of the establishments that primarily have SNI 90.001, have a local authority as their legal form. The public sector (local authorities) accounted for about 95% of the employees in this sector.

4.3.3 Other administrative information

See sections 3.3 and 3.4.

4.3.4 Economic data

Today, there is no annual survey that in itself provides a fully comprehensive picture of the different financial information by branch. The following table 14 shows data from surveys that include information on the sector.

Table 14. Costs and investments in waste water and sewage operations, MSEK

| Survey | Unit | Turn-over | Added value | Variable costs | Capital costs | Investments | Comments |
|--|---|-----------|-------------|----------------|---------------|--------------------------------------|---|
| VAV For 1995 | Local authority incl. Municipal corps and authority- associations | | | 3 729 | 2 101 | 1 942 (Gross invest- ments) | |
| Financial accounts for expenditures | Municipal corps | 391 | 245 | 213 | 0,4 | 152 (Net invest- ments) | |
| For 1996 | Private enterprise | 175 | 154 | 164 | 4 | 12 (Net invest- ments) | |
| Local authority accounts. For 1997 | Local authorities | - | | - | - | - | Water and waste water costs shown together |
| | Municipal enterprise (see financial accounts) | 391 | 245 | 213 | 0,4 | 152 | |
| VAT (1996) | | 768 | | | | | |

4.3.5 Problems

VAV

In principle, the VAV survey should be comprehensive, i.e. directed at all local authorities. Sixteen local authorities failed to provide any information, however, which means that 1995 information for them has been estimated on the basis of imputation. In certain cases, this yields very uncertain information since there is considerable variation in the interval upon which this is based.

There is also an under-estimate of the information presented at local authority level because the administrative costs are sometimes included in the overall municipal costs and sometimes in the operating sector. The accounts from the larger local authorities sometimes include the cost of drinking water and waste water management for smaller neighbouring municipalities. These local authorities also show the corresponding costs, which means that they are presented twice. Earlier studies show that this requires an adjustment of about 5%. This is a relatively small adjustment depending on that the figures are presented twice at overall level which ought to be negligible.

In table 15, current expenditure is not broken down into compensation of employees and intermediate consumption. Output is market, since current expenditure is supposed to be covered by fees. In practice coverage by fees averages 98 %. In Sweden we have a joint water and waste water fee, which makes it hard to compare costs with revenues.

Table 15. Expenditure for waste water management 1991-1995 (SEK Million), in VAV

| Type of expenditure | 1991 | 1992 | 1993 | 1994 | 1995 |
|--------------------------------------|--------------|--------------|--------------|--------------|--------------|
| Operating expenditure | 3 100 | 3 165 | 3 184 | 3 211 | 3 729 |
| Consumption of fixed capital (CFC) | 2 147 | 2 266 | 2 291 | 2 354 | 2 101 |
| Total current expenditure | 5 247 | 5 431 | 5 475 | 5 565 | 5 830 |
| Gross fixed capital formation (GFCF) | 2 545 | 2 529 | 2 427 | 2 246 | 1 942 |
| Total expenditure | 7 793 | 7 960 | 7 902 | 7 811 | 8 076 |

Financial accounts

From the financial accounts you get turnover and other financial data about the enterprises that are classed as SNI 90.001. A more detailed description can be found in section 3.5. The figures are also effected by the fact that the identification of companies not always is correct, which means that the figures will be underestimated.

The statistics make it possible to obtain data separately for local authority and private companies. Branch information based on the data collected is incomplete, however. This is because an enterprise may have operations in several different branches. The company is then classified according to the branch where it has its main operations.

It is also worth noting that there is no point in performing retroactive time series. As of 1997, certain changes have been made in the data collection procedure that makes this more difficult. By making it possible to present certain data for KAU (Kind of Activity Unit), underlying material will be improved at the same time. See below under Local Authority Accounts.

Local authority accounts

Information on local authority finances is gathered by Statistics Sweden on an annual basis. For more details of these statistics, see section 3.7. The statistics do not allow any breakdown of the item "water supply and waste water management". By using the results of the above-mentioned VAV survey, it is possible to estimate the proportion of costs and revenue that is attributable to waste water and water respectively. The result of this type of estimate indicates that, at national level, 40% is attributable to drinking water and 60% to waste water. However, if a corresponding regional estimate is applied, substantial uncertainty is involved.

When using data from local authority accounts there is considerable risk of counting figures twice. If payment is made directly to a local authority by subscribers, but the local authority then forwards the payment to a municipal corporation or private entrepreneur for the services provided, the cost will be shown in two places. The converse may also be true - that payment is made directly to the entrepreneur and the local authority balances it against its own costs for the activities. Data from local authority accounts at detailed level – e.g. information on purchases of operations and contracts could possibly provide an idea of the extent of these

costs. From the statistics today you cannot distinguish this figures. However, this data is unreliable in cases where transfers take place between the local authority and the entrepreneur. For example, the local authority may show the different between the cost of services provided directly to the authority and the income received from water and waste water operations. This has a particular bearing on the interpretation of data involving comparison with VAV statistics.

4.3.6 Conclusions and proposals

Bearing the above in mind, the most comprehensive information on local authority activities in this branch comes from VAV statistics. The disadvantage of these statistics is that they currently involve a substantial time lag. The 1996 figures have not yet been presented. This is largely because of a revision of the accounting system. The new system allows more comprehensive and regular statistics as of 1998. The VAV statistics do not shed light on the cost of the municipalities to the entrepreneurs. Statistics Sweden will try to influence the system upon which the accounts are based so that this type of information can be obtained and to ensure that the same economic variables are used as in Statistics Sweden's own surveys. This would make it possible to avoid a major source of error in the presentation of economic data for the branch.

The alternative – to base the statistics on data from local authority accounts – is not currently feasible when it comes to municipal waste water operations. This is because water and waste water statistics are combined. In the future it may be possible to use the local authority accounts as a complement and a checking against the data from VAV. We will try to influence the accounts to make a breakdown on water and waste water. In order to obtain a clearer picture of the branch, data will be drawn from the financial accounts to supplement those from VAV. It is, however, essential to ensure that definitions and terms are the same in the sources used to describe the branch. Discussions are under way aimed at achieving this.

4.4 Waste management

4.4.1 Introduction

There are a number of different types of operation in which waste is dealt with in different ways in society. Among the core branches discussed in this report, waste management is a significant operation. Earlier sections included discussion of "Recycling" (SNI 37), "Wholesale of waste and scrap" (SNI 51.57) and "Waste Water Treatment" (SNI 90.001). In this section we will look into the other "waste branches" – activities such as processing and disposing of waste (SNI 90.002-90.008).

In order to obtain a specific categorisation of SNI 90, Sweden has extended it with the following sub-groups:

- 90.001 Waste water treatment (described in section 4.3)
- 90.002 Collection, sorting and reloading of non-hazardous waste
- 90.003 Composting and digestion of non-hazardous waste
- 90.004 Deposit on landfills of non- hazardous waste
- 90.005 Receiving, reloading and intermediate storage of hazardous waste
- 90.006 Treatment and permanent storage of hazardous waste

- 90.007 Other waste management
- 90.008 Street cleansing, other sanitary management

These activities may be conducted both under private ownership or public ownership. Many local authorities have establishments that come under these headings. Municipalities are responsible for the collection, treatment and disposal of household waste; waste from households and similar waste from other parts of the society. Recently, a transfer of responsibility to producers (of the goods that become waste at the end of the chain of consuming) has started – in the field of packaging, for example.

4.4.2 Identification of producers in SNI 90

The different sub-categories of SNI 90 are discussed below, with the number of establishments which are classified with this as their primary or secondary operation. For each branch, there is then a discussion of how well the SNI classification agrees with this in the light of other available information – e.g. about the number of facilities in Sweden. There is also some discussion of how the different sub-categories are linked with each other, e.g. if it is normal for one type of activity also to involve another.

Incorrect classification of establishments and enterprises in accordance with SNI in the Business register has an impact on all the statistics based on this register. The number with a given type of activity as the secondary activity may also be of major importance if the statistics are prepared according to the primary classifications. If a given type of establishment often comes under an enterprise with a different branch code, this may also have an undesirable effect on the results if the statistics are prepared at enterprise level.

The two following tables 16 and 17 show the number of establishments for the different sub-branches and the types of legal form involved.

Table 16. Number of establishments which have 90.002-90.008 as primary or secondary SNI

| SNI | Designation | Number of establishments which have as: | | |
|--------------|--|---|---------------|-----------|
| | | Primary SNI | Secondary SNI | Third SNI |
| 90.002 | Collection, sorting and reloading of non-hazardous waste | 521 | 40 | 5 |
| 90.003 | Composting and digestion of non-hazardous waste | 9 | 8 | 3 |
| 90.004 | Deposit on landfills of non- hazardous waste | 23 | 14 | 6 |
| 90.005 | Receiving, reloading and intermediate storage of hazardous waste | 56 | 11 | 9 |
| 90.006 | Treatment and permanent storage of hazardous waste | 12 | 15 | |
| 90.007 | Other waste management | 66 | 22 | 4 |
| 90.008 | Street cleansing, other sanitary management | 331 | 92 | 15 |
| Total | | 1 018 | 202 | 42 |

Table 17. Number of establishments which have 90.002-90.008 as their primary or secondary SNI, broken down according to legal form

| SNI | Designation | Number of establishments which have each legal form: | | | | |
|--------------|--|--|---------------------------------------|-----------------------------------|---------------------------|-----------|
| | | Physical person | Trading partnership joint partnership | Other limited liability companies | Primary local authorities | Others |
| 90.002 | Collection, sorting and reloading of non-hazardous waste | 54 | 25 | 303 | 133 | 6 |
| 90.003 | Composting and digestion of non-hazardous waste | 1 | 1 | 7 | | 0 |
| 90.004 | Deposit on landfills of non-hazardous waste | 3 | | 12 | 7 | 1 |
| 90.005 | Receiving, reloading and intermediate storage of hazardous waste | 2 | 1 | 53 | | 0 |
| 90.006 | Treatment and permanent storage of hazardous waste | 2 | | 10 | | 0 |
| 90.007 | Other waste management | 7 | 14 | 40 | 4 | 1 |
| 90.008 | Street cleansing, other sanitary management | 165 | 33 | 109 | 18 | 6 |
| Total | | 234 | 74 | 534 | 162 | 14 |

A. 90.002 Collection, sorting and reloading of non-hazardous waste

In this branch, there are 521 establishments that have this as their primary activity according to the Business register. These may have rather different activities. Many enterprises have also been classified under this heading when they actually should have a different main code, probably because the designation of the branch is so wide-ranging. This applies particularly to landfills (see 90.004 below).

B. 90.003 Composting and digestion

In the Business register, there are 9 establishments that have digestion or composting (90.003) as their primary activity and 11 that have them as their secondary activity. Of these 11, five have 90.002 as the primary. Of the twenty establishments, sixteen are limited companies, two are trading partnerships and two are physical persons. The following table 18 shows which other branches have 90.003 as their secondary activity according to the Business register.

Table 18. Branches that have 90.003 as secondary activity, number of establishments

| SNI | Designation | 90.003 |
|--------------|--|-----------|
| 26.619 | Manufacture of other concrete products for construction purposes | 1 |
| 52.462 | Retail sale of paint | 1 |
| 52.631 | Retail sale on commission | 1 |
| 90.002 | Collection, sorting and reloading of non-hazardous waste | 5 |
| 90.004 | Deposit on landfills of non-hazardous waste | 1 |
| 90.007 | Other waste management | 1 |
| 90.008 | Street cleansing, other sanitary management | 1 |
| Total | | 11 |

If one studies the establishments in the Business register in greater detail, one can see that some of them are incorrectly coded, e.g. do not work with composting but sell composting equipment. Errors "in the other direction" also occur in the form of establishments that work with composting or digestion not being classified under 90.003. One example of this is the company SYSAV, which according to other information received has a composting facility in southern Sweden. In the Business register, this facility only has the 90.002 code.

In a report entitled Biogas facilities in Sweden (report 1997:4, VAV), the facilities in the country devoted to the production of biogas were mapped out. Digestion (as it is taken to mean in this context) is, according to the report, an activity at:

- 134 sewage treatment plants (internal treatment of sludge)
- 8 industries (internal treatment of sludge)
- 6 farms (slaughterhouse waste and manure)
- 4 facilities for digestion of waste in reactor

The sewage treatment plants that digest their own sludge could have 90.003 as the secondary code, but do not.

In the Environment Protection Agency report entitled Biological treatment of organic waste (report 4612) there is a survey of 24 facilities which have biological treatment of waste. The Swedish Association of Waste Management (RVF) also has a working group for biological treatment. This group consists of members who have, or are planning, facilities for biological waste treatment (or who have documented their interest in this field in some other manner) and has representatives of 19 facilities.

A preliminary review of the four registers of facilities for the biological treatment of waste shows:

- None of the 4 facilities in the VAV report are shown in the others
- Of the 24 facilities in the Environment Protection Agency report, 9 are in the RVF list and 2 in the Business register
- Of the RVF facilities, 9 are in the Environment Protection Agency (EPA) list and 2 in the Business register
- Of the 20 the Business register establishments, 2 are in the EPA list and the same 2 are in the RVF list.

A more detailed review ought therefore to yield a total list of about 55 facilities.

Conclusions and proposals

The four sources/registers above are not consistent. There is incorrect classification in the Business register. If statistics on this sub-branch are to be used or if new statistics are to be drawn up, this part of the Business register should be revised.

C. 90.004 Landfills

There is no good material today on the number of landfills in Sweden. Information concerning their number varies between 300 to 500 (in use). Different types of landfill can be found. Some, for example only receive a certain type of waste, such as construction or demolition waste. Certain industries have landfills to deal with their own waste, and these sometimes

receive waste from elsewhere. Industrial landfills should, insofar as they represent a sufficiently large share of the operations, be classed as 90.004. However, we have not looked into this in conjunction with this report.

In the Business register, there are 43 establishments (compare with the 300-500 above) that are classified as landfills (90.004) for non-hazardous waste. There may be a number of reasons as to why such a large number of landfills are not shown under 90.004 in the Business register – incorrect classification or limitations in the register, for example.

A number of landfills come under local authority operations. Many of these are not included in the Business register. Some of the reasons for this include:

- Small establishments (max 20 working hours per week) are not registered in the Business register (One assumption is that few people (and little time) is required to run a small landfill. In certain cases there are establishments where the working hours are fewer than 20 per week, but which are still registered. (A new EU directive says that no establishments with nobody employed should be included in the register.)
- There is a diffuse rule that activities which represent less than 5% of an enterprise's activities do not need to be stated. This is still often done, at least for local authorities (with the above exception).
- Considering all the establishments that may exist in a local authority (play schools, schools, sports facilities, etc.) it is probably easy for the person providing the information to forget one or two – such as a landfill. It very much depends on who is answering the questionnaire.

In a survey of facilities in conjunction with a study of local authority waste in 1994, the above shortcomings in the Business register were highlighted, among other things. The following table shows a review of ten randomly selected questionnaires from this study. The first column shows what type of facility is involved according to the questionnaire. In nine of ten cases, the responses indicate that the facility is a landfill. The next column shows that the facility has been found as an establishment in the Business register. (Facility is often the same as establishment and the principal is often the same as enterprise.) In the third column, we can see what type of principal is shown in the questionnaire. Several different types of the search in the Business register have been carried out – e.g. name, address, etc., as well as on all the companies of this type in the local authority.

Table 19. Identification of establishments in the Business register.

| Facility/Establishment Acc. to questionnaire | Facility/ Establishment In the Business register | Principal/Company |
|---|---|------------------------------|
| 1. Landfill | SNI 90.002 | Private company |
| 2. Landfill | Not found | Local authority (Vetlanda) |
| 3. Landfill | Not found | Local authority (Årjäng) |
| 4. Landfill | SNI 90.002 (90.004 as secondary code) | Private company |
| 5. Landfill | Not found | Local authority (Strömstad) |
| 6. Landfill | SNI 90.002 | Local authority (Lindesberg) |
| 7. Landfill | Not found | Local authority (Tranås) |
| 8. Landfill | SNI 90.002 | Private company |
| 9. Type of treatment not shown | Under another name, SNI 40.1 | Private company |
| 10. Landfill | Not found | Local authority (Habo) |

Ten companies represent too small a sample to all any real conclusions to be drawn, but one can see some main features that may help to explain why so few landfills are included in the Business register. We can see that five of the ten companies could not be found. These five all have the local authority as their principal. This supports the theory that the local authorities, for some reason, have not reported their landfills to the Business register. Of the other five, one has a local authority as principal, while the other four are private enterprises. Four of the establishments have 90.002 as their primary SNI and one has 40.1 (Production and distribution of electricity). Only one has 90.004 as its secondary SNI. If we drew establishments from the Business register using 90.004 as main or secondary SNI, we would only obtain one of the above establishments. It would therefore appear that the two main problems are

- local authorities with landfills that are not in the Business register at all
- establishments that are classified as some other type of facility, mainly 90.002.

The two tables 20 and 21 show 90.004 (landfill) and 90.002 (collection, sorting, etc.), which secondary SNI they have and which branches have them as secondary branch. (90.002 is shown since a number of landfills appear to have been classified thereunder.) we can see that eighteen of the establishments classed as 90.002 have 90.004 as secondary code. The above reasoning would suggest that the actual figure is much higher.

Table 20. Secondary branches in 90.002 and 90.004, number of establishments

| SNI | Designation | 90.002 | 90.004 |
|--------------|--|---------------|---------------|
| 37.1 | Recycling of metal waste and scrap | 4 | |
| 37.2 | Recycling of non-metal waste and scrap | 1 | |
| 51.57 | Wholesale of waste and scrap | 4 | |
| 52.509 | Retail sale of other second-hand goods in stores | 1 | |
| 74.702 | Disinfecting and exterminating activities | 7 | |
| 90.001 | Waste water treatment | 2 | |
| 90.002 | Collection, sorting and reloading of non-hazardous waste | | 2 |
| 90.003 | Composting and digestion of non-hazardous waste | 5 | 1 |
| 90.004 | Deposit on landfills of non- hazardous waste | 18 | |
| 90.005 | Receiving, reloading and intermediate storage of hazardous waste | 9 | |
| 90.007 | Other waste management | 12 | 1 |
| 90.008 | Street cleansing, other sanitary management | 5 | |
| Total | | 68 | 4 |

Table 21. Secondary activity in 90.002 and 90.004, number of establishments

| SNI | Designation | 90.002 | 90.004 |
|--------------|--|---------------|---------------|
| 01.41 | Agricultural service activities | 2 | |
| 02.019 | Other forestry activities | 1 | |
| 20.302 | Manufacture of other builders' carpentry and joinery | 1 | |
| 40.1 | Production and distribution of electricity | 1 | |
| 40.3 | Steam and hot water supply | 2 | 2 |
| 45.11 | Demolition and wrecking of buildings; earth moving | 2 | |
| 45.23 | Construction of highways, roads, airfields and sport facilities | 1 | |
| 51.53 | Wholesale of wood, construction materials and sanitary equipment | 1 | |
| 51.7 | Other wholesale | 1 | |
| 60.24 | Freight transport by road | 6 | |
| 63.22 | Other supporting water transport activities | 3 | |
| 70.203 | Letting of other premises | 2 | |
| 72.201 | Software consultancy | 1 | |
| 74.202 | Construction and other engineering activities | 1 | |
| 74.702 | Disinfecting and exterminating activities | 3 | |
| 90.001 | Waste water treatment | 3 | |
| 90.002 | Collection, sorting and reloading of non-hazardous waste | | 18 |
| 90.004 | Deposit on landfills of non- hazardous waste | 2 | |
| 90.005 | Receiving, reloading and intermediate storage of hazardous waste | 7 | |
| 90.008 | Street cleansing, other sanitary management | 5 | |
| Total | | 45 | 20 |

Other registers/sources (than the Business register):

In addition to the Business register, there are a number of possible alternative registers that can be used for gathering new data on landfills or as a supplement to the Business register. In future, a waste tax may result in a register of landfills. Another alternative is the Swedish Association of Waste Management's data on those who dispose of waste on landfills. In 1994, with the help of county council environment protection units, they compiled a list of more than 500 landfills which receive waste under the Waste Disposal Act (household waste and waste comparable therewith, other waste such as construction and demolition waste, non-branch specific waste, ash and sludge, and small amounts of branch-specific waste).

Conclusions and proposals

After the above review, we have noted that the registration of landfills in the Business register is probably incomplete. Incorrect classification and establishments missing from the Business register present a problem that affects both the statistics prepared with the help of the register and the information on the number of companies and establishments, etc., drawn from the

register. The missing establishments probably belong to local authorities and it should be possible to correct them without too much effort. One solution to the problem might be to use a questionnaire in the Business register to local authorities accompanied by a special enquiry about landfills.

In conjunction with the landfill tax planned in Sweden, there will probably be some kind of register. This will benefit the production of statistics and can be used to identify landfill facilities.

D. 90.005 and 90.006 Hazardous waste

Just like other waste, hazardous waste can be treated in a number of different ways, e.g. incineration, landfill or recycling. However, such treatment may only be performed at certain facilities and under more controlled forms.

Hazardous waste is defined in the Ordinance concerning hazardous waste. The classification agrees with EWC (European Waste Catalogue). In order to handle hazardous waste, one must have a special permit pursuant to the Ordinance on hazardous waste. There are, however, certain exceptions – e.g. internal management of own industrial waste. According to the Ordinance:

§ 22 Hazardous waste may be stored temporarily, recycled or disposed of professionally only by those with special licence to do so.

§ 23 Licensing applications are processed by the county council of the county where the facilities are located.

Only a limited number of facilities are licensed to deal with hazardous waste. The Environmental Protection Agency (EPA) has information on which these are. In the EPA report entitled National Waste Plan for Hazardous Waste (report 4840, 1997), the names of the facilities are listed along with the types of waste they are licensed to handle. The list shows 58 facilities.

The Business register shows 12 establishments which have management of hazardous waste as their primary code and 15 that have it as their secondary code, i.e. a total of 27, which is only half of the facilities that are involved in this activity according to EPA. According to the Business register, there are 76 facilities classed as 90.005, i.e. reception, transfer, etc. of hazardous waste.

In the following tables, we can see that those under 90.005, which deal with the handling (reception, transfer, etc.) of hazardous waste often have 90.006 as their secondary code, i.e. they work both with management and treatment. No manufacturing industries are classified in the Business register as secondary in these branches, despite the fact that we know that there are industries that are licensed to receive and treat hazardous waste.

Table 22. Secondary branches in 90.005 and 90.006, number of establishments

| SNI | Designation | 90.005 | 90.006 |
|--------------|--|---------------|---------------|
| 74.702 | Disinfecting and exterminating activities | 3 | |
| 90.002 | Collection, sorting and reloading of non-hazardous waste | 7 | |
| 90.005 | Receiving, reloading and intermediate storage of hazardous waste | | 1 |
| 90.006 | Treatment and permanent storage of hazardous waste | 14 | |
| Total | | 24 | 1 |

Table 23. Activities that have 90.005 and 90.006 as their secondary activity, number of establishments

| SNI | Designation | 90.005 | 90.006 |
|--------------|--|---------------|---------------|
| 40.3 | Steam and hot water supply | 1 | |
| 60.24 | Freight transport by road | 2 | |
| 73.102 | Research and development on engineering and technology | | 1 |
| 74.702 | Disinfecting and exterminating activities | 2 | |
| 90.002 | Collection, sorting and reloading of non-hazardous waste | 9 | |
| 90.005 | Receiving, reloading and intermediate storage of hazardous waste | | 14 |
| 90.006 | Treatment and permanent storage of hazardous waste | 1 | |
| 90.007 | Other waste management | 1 | |
| 90.008 | Street cleansing, other sanitary management | 4 | |
| Total | | 20 | 15 |

Conclusions and proposals - 90.005 and 90.006

We can see from the above that the information in the Business register on those whose activities consist of the management or treatment of hazardous waste is not fully consistent with information from other sources. The classification in the Business register is therefore inadequate in this area. Information on which activities should receive these classifications can be obtained from EPA.

Industries that treat their own hazardous waste do not require a licence for this and are not classed under 90.005 or 90.006. If one wants economic data or other statistics which cover these industries, they must also be reclassified in the Business register. Information on which these are can be obtained from the survey of industrial waste carried out by Statistics Sweden.

E. 90.007 Other waste management

The designation for 90.007 is "Other waste management". There are 66 establishments that are classified as 90.007 (primary activity) and 26 which have it as their secondary activity. Since practically all areas of waste are covered by 90.002-90.006, one can suspect that those which are classified in 90.007 really should be classified under one of these other codes for example 90.002 or 90.004. This suspicion is strengthened when one looks at the names of the companies and establishments in this branch.

Table 24. Secondary branches in 90.007 (number of establishments)

| SNI | Designation | 90.007 |
|--------------|--|---------------|
| 90.003 | Composting and digestion of non-hazardous waste | 1 |
| 90.005 | Receiving, reloading and intermediate storage of hazardous waste | 1 |
| 90.008 | Street cleansing, other sanitary management | 1 |
| Total | | 3 |

Table 25. Branches with 90.007 as their secondary activity (number of establishments)

| SNI | Designation | 90.007 |
|--------------|---|---------------|
| 29 | Manufacture of machinery and equipment n.e.c. | 1 |
| 37 | Recycling | 2 |
| 45 | Construction | 1 |
| 60 | Land transport; transport via pipelines | 4 |
| 74 | Other business activities | 1 |
| 80 | Education | 1 |
| 90 | Sewage and refuse disposal, sanitation and similar activities | 16 |
| Total | | 26 |

F. 90.008 Street cleansing, other sanitary management

90.008 is not a waste management activity in the same sense as the others (90.002-90.007).

The designation of this branch is "Street cleansing, other sanitary management". 331 establishments have this as their primary code and 107 have it as their secondary. We have found no reason to question the quality of the SNI coding in this sector. Of those who have this as their primary activity, 165 are physical persons, 109 are limited liability companies and 18 are municipal corporations.

Table 26. Secondary branches in 90.008 (number of establishments)

| SNI | Designation | 90.008 |
|--------------|--|---------------|
| 51.57 | Wholesale of waste and scrap | 1 |
| 90.001 | Waste water treatment | 1 |
| 90.002 | Collection, sorting and reloading of non-hazardous waste | 5 |
| 90.003 | Composting and digestion of non-hazardous waste | 1 |
| 90.005 | Receiving, reloading and intermediate storage of hazardous waste | 4 |
| 90.007 | Other waste management | 3 |
| Total | | 15 |

Table 27. Branches with 90.008 as their secondary activity (number of establishments)

| SNI | Designation | 90.008 |
|--------------|--|---------------|
| 01 | Agriculture, hunting and related service activities | 16 |
| 02 | Forestry, logging and related service activities | 6 |
| 28 | Manufacture of fabricated metal products, except machinery and equipment | 2 |
| 29 | Manufacture of machinery and equipment n.e.c. | 1 |
| 37 | Recycling | 1 |
| 40 | Electricity, gas, steam and hot water supply | 1 |
| 45 | Construction | 44 |
| 50 | Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel | 2 |
| 52 | Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods | 1 |
| 60 | Land transport; transport via pipelines | 17 |
| 70 | Real estate activities | 6 |
| 74 | Other business activities | 4 |
| 90 | Sewage and refuse disposal, sanitation and similar activities | 6 |
| Total | | 107 |

4.4.3 Other administrative data

See sections 3.3 and 3.4.

4.4.4 Economic data

The overall responsibility borne by the local authorities for large parts of society's waste management means that the municipal activities dominate, particularly in SNI 90.002, 90.004 and 90.008.

Economic data on waste management under SNI 90 can be obtained from the following sources.

- local authority accounts
- financial accounts
- VAT register

The complexity of the data should be seen in the light of the fact that the activities can be organised in a number of different ways.

1. In some cases the public authority performs this service.
2. It has, however, become increasingly common to transfer this to public companies. These may be owned by one or more local authorities together or by a neighbouring local authority, etc. Often the public authority collects the waste-fee, and in turn pays the public

company for performing the service. Sometimes the companies collect the fees directly from the users of this service.

3. There are also some private companies performing these services on behalf of the municipalities. Sometimes they collect the waste-fee directly from e.g. households.

In the previously mentioned report entitled Adaptation of Swedish data on Environmental Protection in the Public sector to the SERIEE System, economic data on waste was presented. The source consisted of local authority accounts, which contain information on cost and financing. As for waste water, it was possible to compare 1991 data with information from questionnaires intended to shed light on local authority environmental work. This report is now updated with current data from local authority accounts. The presentation here also includes interviews with those responsible for waste management in local authorities and those responsible for the economic accounting, with the focus on the problems associated with using statistics from local authority accounts. The presentation is completed by figures about the activity in public and private companies.

A. Municipal activities

Information on municipal activities has been drawn from local authority accounts. These statistics are shown in 3.6.

Table 28 shows the costs from local authority accounts. The external costs are shown as intermediate consumption and provide a very rough estimate of these since there are several other sub-items.

Table 28. Expenditure in the domain waste management in local government (Million SEK) according to the Local authority accounts

| Type of expenditure | 1991 | 1994 | 1995 | 1996 | 1997 |
|--------------------------------------|--------------|--------------|--------------|--------------|--------------|
| Compensation of employees (CE) | 710 | 616 | 597 | 583 | 613 |
| Intermediate consumption (IC) | 2 315 | 2 203 | 2 357 | 2 527 | 2 610 |
| Consumption of fixed capital (CFC) | 174 | 216 | 223 | 196 | 203 |
| Current expenditure | 3 199 | 3 035 | 3 177 | 3 306 | 3 426 |
| Gross fixed capital formation (GFCF) | 231 | 304 | 214 | 299 | 245 |
| Total | 3 430 | 3 339 | 3 391 | 3 605 | 3 671 |

The local authority accounts exclude private companies and municipal companies.

One can gain some idea of how waste management is distributed between local authorities and others from the survey that was carried out on municipal waste in 1994. This questionnaire gave data on who carried out the collection and transport from households, etc. The responses were limited to stating who dealt with more than 60% of the collection and transport in a municipality. Table 29 shows that the majority of local authorities use entrepreneurs for all types of waste. They also said that in more than 20% of cases in which the entrepreneur performs collection and transport, it is also the entrepreneur that charges the households directly. There are also cases where partial charges are levied by the entrepreneur.

Table 29. Collection and transportation percentage of municipals

| Waste type | Municipal administration | Municipal company | Other transporter |
|-------------------|-------------------------------------|------------------------------|------------------------------|
| Household waste | 23 | 11 | 66 |
| Hazardous waste | 4 | 15 | 81 |
| Industrial waste | 9 | 8 | 83 |

One can see that local authorities use entrepreneurs if you study the figures for 1997 for individual municipalities. Almost 30 municipals have no waste management expenditure. These include some of the largest municipalities, such as Stockholm. According to the interviews with those in charge, this is primarily attributable to the use of entrepreneurs who also charge the households directly.

The local authority also include information on financing, which can be seen in the next table. This is divided into financing of current and capital expenditure. In principle, fees should cover this activity.

Table 30. Financing in the domain waste management in local government in 1995-1997 according to the Local authority accounts. (Million SEK)

| Financing | 1997 | 1996 | 1995 |
|-------------------------|--------------|--------------|--------------|
| Current | | | |
| External fees | 2 682 | 2 650 | 2 327 |
| External rent | 5 | 5 | 3 |
| Other external revenues | 317 | 289 | 365 |
| Internal revenues | 333 | 296 | 403 |
| Total | 3 337 | 3 239 | 3 098 |
| Capital | | | |
| Government grants | 4 | 1 | 4 |
| Other | 17 | 5 | 9 |

B. Municipal companies and private companies

In order to obtain a full picture of the costs in this branch, one must include the costs for municipal and private companies that are classed as 90.002-90.008. Information on the municipal companies can be drawn either from the lists of municipal companies in local authority accounts or via the financial accounts. Both studies are based on the same material. The financial accounts also provide data on private companies. It would therefore be appropriate only to use data from the financial accounts.

The following tables 31 and 32 show important economic data which could be obtain from these sources for municipal companies and private companies.

Table 31. Cost of waste management, municipal companies, 1996 (MSEK) in the financial accounts

| SNI | Number of enterprises | Turnover | Added value | Variable costs | Capital costs | Net investments |
|--------------|-----------------------|--------------|-------------|----------------|---------------|-----------------|
| 90.002 | 27 | 1 382 | 575 | 1 176 | 3 | 285 |
| 90.003 | | | | | | |
| 90.004 | 2 | 34 | 12 | 25 | 0,5 | 4 |
| 90.005 | 2 | 59 | 12 | 54 | 0,7 | 7 |
| 90.006 | | | | | | |
| 90.007 | 6 | 142 | 51 | 121 | 0,7 | 25 |
| 90.008 | 2 | 31 | 13 | 24 | 3 | 5 |
| Total | 39 | 1 648 | 663 | 1 400 | 8 | 326 |

Table 32. Cost of waste management, private companies, 1996 (MSEK) in the financial accounts

| SNI | Number of enterprises | Turnover | Added value | Variable costs | Capital costs | Net investments |
|--------------|-----------------------|--------------|--------------|----------------|---------------|-----------------|
| 90.002 | 209 | 2 711 | 1303 | 2358 | 17 | 291 |
| 90.003 | 8 | 9 | 4 | 6 | 0 | 6 |
| 90.004 | 5 | 38 | 8 | 31 | 2 | 2 |
| 90.005 | 9 | 448 | 227 | 325 | 30 | 38 |
| 90.006 | 14 | 137 | 62 | 110 | 9 | 22 |
| 90.007 | 40 | 151 | 49 | 132 | 4 | 22 |
| 90.008 | 143 | 486 | 186 | 436 | 17 | 20 |
| Total | 428 | 3 980 | 1 839 | 3 398 | 79 | 401 |

Turnover can also be obtained from the VAT-register, which also shows the extent of exports from these branches.

Table 33. Total turnover in million SEK excluding VAT and the share of turnover of goods and services to foreign countries

| SNI | 1993 | | 1994 | | 1995 | | 1996 ¹⁾ | | 1997 ¹⁾ | |
|--------------|---------------|--------------|---------------|--------------|---------------|--------------|--------------------|--------------|--------------------|--------------|
| | Total | Export | Total | Export | Total | Export | Total | Export | Total | Export |
| 90.002 | 3 458 | 6 | 3 692 | 18 | 4 101 | 27 | 4 134 | 29 | 4 291 | 18 |
| 90.003 | 2 | 0 | 2 | 0 | 4 | 0 | 9 | 0 | 15 | 0 |
| 90.004 | 55 | 0 | 59 | 0 | 60 | 0 | 78 | 0 | 76 | 0 |
| 90.005 | 399 | 1 | 450 | 14 | 428 | 18 | 663 | 21 | 723 | 26 |
| 90.006 | 93 | 22 | 150 | 72 | 123 | 34 | 143 | 41 | 98 | 13 |
| 90.007 | 143 | 1 | 167 | 1 | 245 | 5 | 200 | 6 | 267 | 7 |
| 90.008 | 367 | 0 | 471 | 1 | 507 | 2 | 484 | 1 | 511 | 0 |
| Total | 11 776 | 1 019 | 12 656 | 1 385 | 15 631 | 1 778 | 15 467 | 1 724 | 16 203 | 1 615 |

1) Partly projective

4.4.5 Problems

- In Sweden, SNI 90 is divided into sub-classes. The local authorities are responsible for a large part of the activities. Local authority accounts do not divide data into collection, transport, treatment, etc. They are not designed to make this possible.

- There is a relatively large amount of incorrect classification of establishments in this branch, which may affect the economic accounting based on this data. However, much of the incorrect classification lies within SNI 90, i.e. an establishment is correctly classified under SNI 90 but is in the wrong sub-category. This means that the presentation of statistics for SNI 90 as a whole is less of a problem. This is described in more detail under section 4.4.2.
- A number of establishments are not even included in the Business register. This may be attributable to various factors, see above, and affects the interpretation of the economic variables.
- Municipal activities are organised in such widely differing ways in different local authorities that it is difficult to compile data about them.
- Costs could be counted twice in cases where the local authorities use entrepreneurs who are paid by the local authority accounts. This impairs the possibility of interpreting the information in local authority accounts unambiguously. If, for example, waste management is carried out by private companies or public companies, some of the local authority expenditure for waste management appears under external expenditure even if the local authorities do not make the work. At present, it is not possible to show this item separately in order to show who received payment. In certain other areas, this information is available. Those responsible for economic statistics have said that this will probably be possible for waste as well in the future. This will make it possible to avoid double-counting.
- The main problems associated with using the financial accounts were outlined above in conjunction with the recycling industry.
- It is not possible to sum up the figures from private and public companies with the figures from local authority accounts. There is for example a difference in the design of the figures. As mentioned above there is also a risk of counting twice.

The following further problems have emerged in interviews with those responsible in the context of the fact that expenditure and income may be on quite different levels when comparing individual local authorities. This makes local authority accounts difficult to interpret.

- The municipality may be responsible for acquisition of tanks, running recycling stations, etc. The local authority also pays the entrepreneur for collecting waste, etc., from its own activities. The municipality then has an investment but the entrepreneur makes the work and their costs are included in another statistics. If you study statistics the total waste management the figures for investments then could be wrong depending on double counting.
- Local authorities have entrepreneurs but hand the administration themselves. There are cases where the administrative services associated with waste management are not booked under management but under some completely different municipal activity.

4.4.6 Conclusions and proposals

Assuming that one wants to describe the total economy in the area of waste, the municipal annual accounts can provide a basis for expenditure incurred by local government. The main problem at present is that it is not possible to obtain information about the percentage of extra costs which are for payment to entrepreneur. In the coming years, however, local authority accounts will be improved in this respect. The costs shown will thus provide a good estimate, as this source covers a large share of total expenditure in local government in the waste domain. The sources of error that have been mentioned here, including administration, which

are attributed to some other area of local authority activity should be fairly small. The problem of incorrect classification of companies should be solved in conjunction with those responsible for the Business register. This can be done in Sweden when population frameworks are generated for the statistical data to be drawn up pursuant to a proposal for a new waste statistic regulation.

As mentioned above, the information drawn from financial accounts is for companies. As of 1997, it will be possible to present certain important data for units which will provide a better basis for statistics about this part of the branch. There is still a problem in obtaining supplementary information for establishments with a small turnover and few employees from existing statistics. The best way to do this would be with a questionnaire to those companies that have establishments in the branch and who are not covered by the financial accounts. This sort of questionnaire would be relatively narrow in scope. In 1996, for example, there were over 200 establishments with SNI 90.002-90.008 as their secondary code. In our future work, differences in definition etc., the information currently obtained from local authority accounts and financial accounts will be discussed with the person responsible for the statistics. This will eventually lead to better co-ordination, it is hoped.

5. Conclusion and future work

5. Conclusion and future work

As shown in this report there are problems using present registers and statistics to get a total, detailed description of economic and other variables for producers of environmental services in Sweden. To identify companies and establishments that produce these services, the Business register has been examined. We found that the Business register has to be improved in order to get more comprehensive and useful statistics. For example there are

- wrongly classified companies. Typical examples are landfills (SNI 90.004 that in the register are classified as collection, sorting and reloading of non hazardous waste (SNI 90.002)
- companies or establishments not found in the register. One example of this are the companies which have an activity linked with hazardous waste.
- companies that should have a secondary activity in the branches but does not get this code. Examples of this are manufacture industries which we know are licensed to receive and treat hazardous waste (SNI 90.005 and 90.006).

All problems with the Business register affect the statistics based on this register. This could be either sample surveys or total surveys where you collect data for companies or establishments. For statistics on producers of environmental services this is to a high degree valid for the financial accounts, manufacturing statistics, and education and employment registers. There are at least three possibilities of getting better statistics

- In the future it should be possible to solve part of this problems in conjunction with those responsible for the Business register. For example we will propose that the questionnaire, which is sent out to enterprises and municipalities, will be increased with questions dealing with the use of the register for environmental purposes.
- To update the register it should also be possible to use the knowledge of environmental statisticians at Statistics Sweden to make supplements to the classified enterprises, and also make other amendments in the register. In some special cases a separate questionnaire could be sent out to the companies, establishments and so on.
- A third way that could be considered is to make a NACE-help list which describe different waste categories and which can be used by all statistical departments at Statistics Sweden. This has been mentioned in the document "Statistics on Private Specialised producers: the Dutch Experience (Doc. Ind/97/12/final).

If the above mentioned changes in the Business register are carried through, this will result in improvements for all statistical sources of producers of environmental services.

To get better data from the financial accounts as well as manufacture statistics and the local authority accounts there must be some improvements.

- The cut-off limits in the financial accounts and manufacture statistics will cause less problems from the 1997 survey. There will also be improvements to get better economic figures for establishments from 1997 onwards.

- As already mentioned there are some problems in the financial accounts, to get the wanted data for some variables, e.g. gross investments, and there are some variables which have different definitions in different surveys.
- The local authority accounts give us useful economic figures for waste management in municipals, but you cannot distinguish the wanted variables for waste water treatment in the accounts. This depends on the fact that the accounts does not separate water supply and wastewater treatment. Another problem is that it is not possible to follow the payment streams, which could lead to double counting.

In the years to come we will start co-operation with the people responsible for especially the financial accounts in order to get more useful figures for the environmental statistics, including environmental accounts and statistics for producers of environmental services. One of the first things to be solved is how to get figures on payment streams.

One important source for the statistics about wastewater treatment today, and at least a few years to come is be data from the Water and Waste water Management Association. Even in this statistics it is not possible to get figures about the payment from municipalities to entrepreneurs. It has also been shown that there are some differences in definitions in the statistics from VAV and between for example the financial accounts. Our purpose is to influence the VAV-data so that it will be more useful for the environment statistics in the future.

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