

Adaptation of Swedish Data on Environmental Protection  
in the Public Sector to the SERIEE System

Final Report

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# 1 Introduction

## 1.1 *Objective and Delimitations*

The objective of this project has been to test adaptation of existing Swedish statistics on environmental protection (EP) in central and local government, to the breakdowns of data required to implement an EPEA. Due to the nature of existing data, the objective has been broadened to include possibilities to provide new data for the public sector. An important outcome is conclusions for future work. After this project, Statistics Sweden will evaluate the results of the work done, and decide how and what data to produce for the public sector in the future.

Considering the objective of this project, many aspects of general government have to be left out, or are only touched upon briefly. These include e.g. transfers, environmental taxes, and EP activities in general government financed by fees.

Please note that any data presented in this paper is to be regarded as preliminary. Work will continue and data may be subject to revisions.

## 1.2 *Existing Data*

The main source for compilation of economic statistics on environmental protection in the public sector is the central government budget. Every financial year the budget is analysed in a systematic way, in order to estimate the magnitude of central government expenditure. A table is compiled of government grants specified for environmental protection (EP). Preliminary data for 1997 are now available. This source does not, with a few exceptions, cover general grants financing EP measures, and not measures financed by fees. This source needs adaptation before it is compatible with data from other sectors and with the requirements of SERIEE.

For local government, data is only available for 1991. For this year Statistics Sweden carried out a survey of environmental protection expenditure in municipalities. This survey covers data for most of the work done in municipalities: in municipal administrations, heating plants, waste and wastewater management. Waste and wastewater management dominate EP expenditure in local government.

A test of the SERIEE:s Environmental Protection Expenditure Account, which was done at statistics Sweden last year, has provided useful input for the work of this project. Please note that data presented in that report now has been revised.

## 1.3 *Possible future sources not hitherto used*

For central government, more detailed data are to be found in the government budget, specifications for individual grants such as material from the National Audit Bureau specifying actual expenditure for each government grant, and especially in annual financial reports of national and regional institutes handling the grants. These financial reports may also give information of EP activities which are not financed by government grants specified for EP.

For data on wastewater management in local government, the Water and Wastewater Management association (VAV) publish data on expenditure annually. Data for water (not EP

according to SERIEE) and wastewater are separated. At the moment, we have access to data from 1991 to 1994.

An important source of information not hitherto used is the annual accounts of the municipalities, compiled by Statistics Sweden, and providing a basis for the national accounts. In these accounts information on current and capital expenditure for three EP areas are available: departments for EP in municipalities, waste management, and water and wastewater management (not separated).

#### **1.4 The public Sector in Sweden**

The public sector in Sweden can be divided into three levels: one national, one regional and one local level. The national level includes the government and national agencies, such as the EPA. The regional level includes e.g. the County Administrative Boards and the County councils (responsible for health-care). The local level is dominated by municipalities.

*Figure 1. Schematic description of the Public sector in Sweden*

<b>Public sector</b>	<b>National</b>	Government	Agencies
	<b>Regional</b>	County Adm. Boards	County Council
	<b>Local</b>	Municipalities	
<b>Private sector</b>	Household	Companies	NPISH

Large sums of money is transferred between different entities of the public sector, as well as from the public sector to households and enterprises. A distinct feature of the public sector in Sweden is the amount of transfers between and within different levels of the public sector. This is also the case for grants financing environmental protection. Let us take the grant specified for liming as an example.

- In 1993 this grant equalled 176 Million SEK, and was part of a larger grant sorted under the Ministry of the Environment.
- The grant is handled by the EPA. They distribute money to the County Administrative Boards, after receiving specifications of projects.
- The County Administrative Boards in their turn distribute money to individual projects within a county.
- These individual projects are the responsibility of local units of the National Board of Forestry.
- In the end, these type of grants find their way to municipalities and companies effectuating the actual environmental protection measure.
- At the same time, parts of the original grant may cover administration expenditure at different levels of the public sector.

Thus, these activities result in final consumption at several levels of the public sector, as well as transfers through the public sector. In this project we have, to some extent, tried to take account of these special features. In section 2.4 total transfers for the grants specified for EP are estimated. A distribution on receiver has not been possible as yet, with the exception of transfers to the Rest of the World (RoW). A more detailed analysis of the system of transfers is not within the scope of this project.

Government grants can be divided into general and specified grants. For central government, existing data refers mainly to total grants specified for environmental protection. These are singled out every year through a systematic study of the central government budget. This study only covers a part of EP expenditure financed by central government, and should be treated as a minimum. One reason is the fact that some of the largest grants are general: e.g. grants destined for municipalities and other regional levels of general government. The general grants are bound to finance some environment protection, but this cannot be singled out. This is enhanced by the fact that, in Sweden, more and more EP activities are integrated with other activities.

Considering the magnitude of the general grants, and the fact that the grants are bound to finance some sort of EP activity, it is easy to see the importance of investigating also these general grants. Let us take the grant for municipalities as an example. This equalled 77 Billion SEK in 1995. It has not been possible as yet to single out that part which finance EP activities, and no new survey of the municipalities is planned.<sup>1</sup> The total amount of grants specified for environmental protection only makes up about four percent of this general grant.

The table of grants for EP only include two general grants: those destined for the Agency responsible for development assistance policy (SIDA), and to departments for EP in the County Administrative Boards. For these, we have studied financial reports for 1995.

- 1 In the case of SIDA, they account separately the share of the total grants destined for environmental aid which is included in the table. At the same time much of the grants specified for specific countries include EP measures. In the financial report for 1995 this was reported to be about 80 Million SEK. We have opted for a minimum approach in this project before a more complete picture of these types of grants are at hand. This means that this expenditure has not been included in the analysis in the next section.
- 2 Total general grants for the 24 County Administrative Boards equalled 1.796 Million SEK in 1995. Apart from general grants, they finance their activities mainly by some specified grants. For the departments for EP, total expenditure in 1995 equalled 376 Million SEK. This was financed by 186 Million SEK from general grants, and 190 Million SEK from other sources, mainly from specified grants already included in the table of government grants for EP. We have therefore only included general grants here, in order to avoid double-counting. Apart from the departments for EP, some environmental protection takes place in other departments at the County Administrative Boards, but these activities cannot be singled out, and have been left out here. We have also left out any indirect costs borne by the departments for EP, which means that this figure also should be interpreted as a minimum.<sup>2</sup>

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<sup>1</sup> It might be possible in the future to cover some of this expenditure through the use of annual financial reports and the annual accounts of the municipalities, as shown in section 3.

<sup>2</sup> There is some information on these indirect costs in the financial accounts. These would have to be analysed in more detail before they could be included in the analysis. This has not been possibly in the scope of this project.

## 2 Central Government

### 2.1 Introduction

A lot of work in this project has centred on central government. This is because we have access to annual data which is non-compatible with data from other sectors. Before 1995, the EPA compiled data of government grants specified for environmental protection. The definition of EP is not always consistent with that of the SERIEE. Last year, Statistics Sweden took over this function, without really changing the definitions used by the EPA. Preliminary data for 1997 are now available. We have in this project concentrated on data for 1995, mainly because of the availability of annual financial reports. We have however also included data from 1991 because of the possibility to compare data for central government with results from surveys in municipalities and industry. This means that data for 1991 will be adapted in the same way as for 1995 but without all the detailed information available for the latter year, hence more use of estimations is necessary.

Existing data for central government need to be adapted in a number of ways:

- data have to be revised with the introduction of new and more detailed sources of information, and due to differences in definitions in relation to those of the SERIEE;
- data need to be converted from grants to actual expenditure;
- grants and expenditure need to be broken down into the environmental domains of CEPA;
- and expenditure need to be broken down into final consumption, investments, and transfers. Transfers should be further divided according to receiver.

In section 2.5 we have included some additional information on environment .

### 2.2 Revision and Conversion to Expenditure

By using new and more detailed sources of information, we have been able to improve the quality of our data. We have made corrections for inconsistencies in the original data, and we have also discovered new grants not included in the original material. The results are presented in the table below.

*Table 1. Government grants specified for EP (SEK 1000)*

	1991	1995
<b>Original data</b>	1 894 758	2 795 600
New grants	125 000	340 145
Corrections for inconsistencies	19 136	-24 185
<b>Revised data</b>	2 038 894	3 111 560

The new and revised data need to be converted from government grants to actual expenditure within a given year. It is possible to divide the grants in four different types, according to the procedure, and source of information, used for the conversion of grants to actual expenditure:

- The first type consists of grants which are deemed to be 100 percent EP. For these grants, the National Audit Bureau (RRV) publish accounts of actual expenditure annually. This means that the conversion to expenditure is fairly straightforward. In 1995, these grants constituted about 2/3 of the total grants.
- The second type consists of grants that are not 100 percent EP, but which are separated in annual financial reports. In this project we have only used annual financial reports for the EPA and SIDA.

- The third type relates only to the departments for EP at the County Administrative Boards. In this case grants are estimated, based on budgets, and this sum is not really comparable with the sum of actual expenditure. The latter figure is based on a study of the more detailed financial reports.
- For those grants which are not covered above, some sort of estimation procedure is necessary. They are all parts of larger grants, and we have assumed the same relation between grant and expenditure for the EP-part, as for the non-EP part. Then we can use the accounts of the National Audit Bureau. It is also possible to further reduce this category of grants through the inclusion of more annual financial reports.

In 1995, total aggregate expenditure was 17 percent lower than total grants received that year, as can be seen in the table below. It is also interesting to note that about two thirds of the grants can quite easily be transformed to actual expenditure, and that an estimation procedure only had to be used for less than ten percent of the total sum of grants. For the year 1991 we have not been able to use annual financial reports, which means that for about 40 percent of the total sum of grants we have used the estimation procedure above in order to convert grants to expenditure.

*Table 2. Grants specified for EP compared with actual expenditure (SEK 1000)*

Sources of information	Central government 1991			Central government 1995				
	National Audit Bureau (RRV)	Estimates from RRV	Total	National Audit Bureau (RRV)	Annual financial reports	County Adm. Boards	Estimates from RRV	Total
<b>Grants</b>	1 257 913	780 981	2 038 894	2 041 312	517 800	270 000	282 448	3 111 560
+ From previous year				1 109 389	45 028			
- Withdrawn				95 488	19 000			
- To next year				1 201 994	247 693			
= <b>Expenditure</b>	1 122 355	811 044	1 933 399	1 853 219	296 135	186 072	248 712	2 584 138

### **2.3 Breakdown into Environmental Domains**

When breaking down data into domains, we have used detailed specifications for grants and parts of grants. There are large differences as regards the difference between grant and expenditure. This will translate into large differences for different domains, especially since some domains are dominated by a small number of grants. Since actual expenditure had to be estimated for a few of the grants, it is also apparent that expenditure in domains dominated by these types of grants will be more uncertain. Generally speaking, it seems possible to distribute the grants to the domains of CEPA. There are a few border-line cases though, especially regarding measures in the agricultural sector and for the domains soil and biodiversity.

Data will have to be revised also on account of possible differences in definitions of EP. This is easy when the information concerns individual grants, but is difficult for parts of grants. In section 2.2 a revision of individual grants were made. By using information from annual financial reports, we have here been able to single out some parts of grants in table of grants specified for environmental protection, but which are not EP according to the SERIEE definitions. We have deducted these before the break-down into environmental domains. The deduction in this case regards only environmental aid (transfers to the RoW) directed towards supply of water and social aspects. The results of the break-down can be seen in the table below.

*Table 3. Grants for EP divided into environmental domains (SEK 1000)*

<b>Environmental domains (CEPA)</b>	<b>1991</b>		<b>1995</b>	
1. Protection of ambient air and climate	286 111	14%	63 563	2%
2. Waste water management	37 144	2%	266 715	9%
3. Waste management	16 116	1%	17 653	1%
4. Protection of soil and groundwater	186 644	9%	240 603	8%
5. Noise and vibration abatement		0%	50 000	2%
6. Protection of biodiversity and landscape	550 133	28%	1 038 093	34%
7. Protection against radiation	29 811	2%	135 543	4%
8. Research and development	152 236	8%	319 586	10%
9. Other environmental protection activities	725 453	37%	919 821	30%
<b>Total environmental protection</b>	<b>1 983 648</b>	<b>100%</b>	<b>3 051 579</b>	<b>100%</b>
Deduction for non-EP activities	55 246		59 981	
Total	2 038 894		3 111 560	

If we compare figures for 1991 and 1995, we see that the relative sizes of the domains are fairly constant between the two years, with two exceptions:

1. For the domain air, the relatively high share in 1991 is the result of grants directed towards measures in the traffic sector: e.g. subsidies on installations of catalytic converters on old cars. 1991 was the last year of these subsidies.
2. For the wastewater domain, the share of the grants in 1995 is considerably higher than in 1991. In 1995, this domain was dominated by environmental aid directed towards countries in the Baltic Sea area. This particular grant did not exist in 1991. As we will see later, actual expenditure was considerably lower than total grants in this year.

As mentioned above a break-down of expenditure into domains will require some use of estimations: i.e. assumptions that relations between grant and expenditure for parts of grants will equal the relations for individual grants (mostly EP grants, but sometimes also non-EP grants). For 1995 though, estimations were only necessary for a small amount of the total sum of grants. The results are presented in the table below.

*Table 4. Expenditure divided into domains (SEK 1000)*

<b>Environmental domains (CEPA)</b>	<b>1991</b>		<b>1995</b>	
1. Protection of ambient air and climate	179 626	10%	59 718	2%
2. Waste water management	36 469	2%	89 135	4%
3. Waste management	16 318	1%	17 312	1%
4. Protection of soil and groundwater	152 639	8%	167 119	7%
5. Noise and vibration abatement	0	0%	46 799	2%
6. Protection of biodiversity and landscape	543 754	29%	945 255	37%
7. Protection against radiation	32 062	2%	94 060	4%
8. Research and development	145 969	8%	326 282	13%
9. Other environmental protection activities	772 863	41%	785 699	31%
<b>Total environmental protection</b>	<b>1 879 700</b>	<b>100%</b>	<b>2 531 379</b>	<b>100%</b>
Deduction for non-EP activities	53 699		52 759	
Total	1 933 399		2 584 138	

As can be seen from the tables above, a large proportion of both grant and expenditure are attributed to domain 9. Does these large shares imply that a large amount of grants cannot be distributed to domains, but are allocated to the domain other? It seems necessary to specify



this domain further. According to CEPA this domain shall consist of four different headings, but it seems to be a bit unclear what these should include. In the table below a more detailed specification is made of what we have included under the respective subheadings.

*Table 5. Specification of expenditure in CEPA 9 in 1995 (SEK 1000)*

Activities included in CEPA 9	Grants	Expenditure
<b>9,1 General adm. of the environment</b>	<b>374 283</b>	<b>355 208</b>
of which		
General environmental aid	119 140	104 795
Administration and over-head	88 411	86 701
Surveillance	74 710	72 385
Investigation	70 338	68 977
National Franchise Board for EP	17 835	18 695
Statistics	3 848	3 654
<b>9,2 Education, training, information</b>	<b>67 877</b>	<b>65 753</b>
<b>9,3 Activities leading to indivisible exp.</b>	<b>450 461</b>	<b>343 635</b>
of which		
County Adm. Boards	270 000	186 072
Min. of the Env. + Env. Institute	95 248	86 009
Grants for organisations (incl. Internat.)	85 213	71 554
<b>9,4 Activities not elsewhere specified</b>	<b>27 200</b>	<b>21 104</b>
<b>Total</b>	<b>919 821</b>	<b>785 699</b>

#### *9,1 General administration of the environment.*

General environmental aid is the largest item under this heading. Apart from "pure" administration, it includes such as environmental law, strategies and "green" economics. The second largest item concerns mainly administration and shares of over-head costs attributed to environmental functions at the EPA.<sup>3</sup> Other large items under this heading are surveillance: national, regional or international co-operation in this area; and investigations conducted by the EPA mainly of a general strategic and policy nature.

#### *9,2 Education, training and information.*

This heading includes education and information conducted by the EPA, and a special information campaign in the area of biodiversity. These measures could be divided into the domains 1-8 but have not been so, following the SERIEE recommendations.

#### *9,3 Activities leading to indivisible expenditure*

Not surprisingly this is a large sub-heading. But the objective of our work has been to distribute the grants to other headings as far as is possible. This heading includes grants financing part of the activities of special organisations, County Administrative Boards and special environment institutes. This expenditure is probably only to some extent of a really indivisible nature. It might be possible to re-distribute a large share of these to domains 1-8 after a more detailed study of the activities of these entities: e.g. using annual financial accounts.

<sup>3</sup> It seems possible to distribute the over-head to environmental domains 1-8.

#### *9,4 Activities not elsewhere specified*

This heading is of minor importance, partly because the ambition has been to distribute as many grants as possible to the other domains. It includes grants for local Agenda 21 work, grants financing marketing of environment products, and measures directed towards the effects of acidification on the cultural heritage.

Up till now we have used the term expenditure in the broad sense of the word: i.e. actual spending on the various grants. This means that the figures presented so far include not only actual final consumption, and investments in central government, but also a large amount of transfers. In principle, this still equals total EPE, although a part will finance measures in other sectors. In order to avoid double-counting when aggregating national expenditure, it is imperative to adjust the data above for these transfers. In the next section we shall try to break down expenditure into final consumption, investments, and transfers.

#### **2.4 Breakdown of Expenditure**

In principle it is possible to include information of the use of each individual grant as a basis for a break-down of expenditure. This is however very time-consuming and has not been deemed practical to do in this project. At the same time we still want to use some information from the individual grants as background information for this distribution. In this case we have based the amount of transfers to the RoW on this detailed information.

In our study, we have coded each grant and part of grants with as much background information as possible:

- under what ministry the grant is sorted,
- size of the grant and size of expenditure,
- sources used as regards expenditure,
- environmental domain,
- whether the grant is a transfer to the RoW or not etc.

In this section we have used information on expenditure, environmental domain, and the ministry responsible. In the table below we see expenditure on grants specified for EP under the responsible ministries, broken down on environmental domains. As can be expected the majority of the grants are sorted under the Ministry of the Environment. Total expenditure for this ministry was 2.275 Million SEK in 1995, which means that EPE represents over 70 percent of total expenditure in this ministry. For other ministries this particular type of expenditure represents only a small part of total expenditure.

*Table 6. Expenditure in specific ministries 1995 divided into domains (SEK 1000)*

Ministry/Domain	1	2	3	4	5	6	7	8	9	Total
Environment	23 537	38 813	17 312	33 819		787 077	94 060	227 413	446 605	1 668 635
Foreign Affairs	21 207	26 897		82 760		23 587			127 036	281 487
Public Adm.									191 072	191 072
Industry	14 974					81 683		62 973		159 630
Labour		23 425		17 569	46 799	17 569				105 361
Agriculture				32 972		35 340		6 800	11 529	86 640
Transport & Comm.								29 097		29 097
Culture									9 457	9 457
Total	59 718	89 135	17 312	167 119	46 799	945 255	94 060	326 282	785 699	2 531 379

The break-down of expenditure will be based on averages for each responsible ministry. In the table below, total expenditure in 1995 in the respective ministries is divided according to actual use into final consumption, investments and total transfers.<sup>4</sup>

*Table 7. Total expenditure in specific ministries 1995 distributed according to use (SEK Million)*

Ministry	Final C		GFCF		Transfers		Total
Environment	1 574	69%	154	7%	539	24%	2 267
Foreign Affairs	4 050	25%	127	1%	12 240	75%	16 417
Public Adm.	1 856	85%	9	0%	324	15%	2 189
Industry	404	13%	21	1%	2 686	86%	3 111
Labour	11 396	25%	11	0%	34 738	75%	46 145
Agriculture	2 208	37%	101	2%	3 668	61%	5 977
Transport & Comm.	11 362	38%	14 685	49%	3 847	13%	29 894
Culture	3 070	20%	38	0%	11 946	79%	15 054

In order to be able to break down EP expenditure, we have assumed that the average distribution in the ministries above, equals the distribution for the grants specified for EP. This may be a safe assumption when EP grants constitute a majority of the total grants, as for the Ministry of the Environment, but is considerably less reliable when EP grants are a very small portion of the total grants. As grants sorted under the Ministry of the Environment totally dominate the total EP expenditure, the reliability of these kind of estimates may not be all that bad on average. It may however be a more serious problem for specific environmental domains, if one domain is dominated by grants from other ministries: e.g. domain 5. Noise and Vibration Abatement (see table 6. Above). The result of the exercise is presented in the table below.

*Table 8. Total environmental protection expenditure distributed according to use (SEK 1000)*

CEPA	Central government 1991				Central government 1995			
	Final C	GFCF	Transfers	Total	Final C	GFCF	Transfers	Total
1.	81 745	41 153	56 728	179 626	23 518	1 864	34 336	59 718
2.	8 546	1 696	26 227	36 469	39 369	2 850	46 916	89 135
3.	9 519	2 720	4 079	16 318	12 020	1 176	4 116	17 312
4.	29 473	3 291	119 875	152 639	60 416	3 499	103 204	167 119
5.	0	0	0	0	11 558	11	35 230	46 799
6.	276 078	69 730	197 946	543 754	580 295	54 802	310 158	945 255
7.	18 703	5 344	8 016	32 062	65 307	6 390	22 364	94 060
8.	81 985	22 706	41 279	145 969	179 644	30 282	116 357	326 282
9.	430 962	76 664	265 237	772 863	509 614	32 325	243 759	785 699
Total	937 011	223 303	719 386	1 879 700	1 481 740	133 200	916 439	2 531 379

Total Central Government EPE in 1995 equals 1.615 Million SEK, of this 1.482 constitutes final consumption, and 133 constitutes GFCF. Total transfers in this particular year was 916 Million SEK. The figures for 1991 are 1.160 Million SEK for total EPE, of which final

<sup>4</sup> Source: National Audit Bureau. Total expenditure is divided into the three types above plus an item comprising lending and other purposes. This item is of insignificant proportion and has been disregarded in the estimations in this section. For the Ministry of the Environment for example, the figure for this item was 8 Million SEK in 1995. Equalling 0,4 percent of the sum of the other three items.

consumption was 937 and GFCF was 223. Total transfers amounted to 719. Transfers finance EP measures in other sectors and abroad. As yet, we have not been able to distribute transfers according to receiver. It is however possible to single out expenditure financing measures abroad, using the detailed information concerning individual grants. This is presented in Table 9.

*Table 9. EP transfers to the rest of the world in 1995 (SEK 1000)*

<b>Environmental domains (CEPA)</b>	<b>1991</b>		<b>1995</b>	
1. Protection of ambient air and climate	21 585	6%	21 207	5%
2. Waste water management	27 376	8%	56 064	15%
3. Waste management				
4. Protection of soil and groundwater	84 234	24%	82 760	21%
5. Noise and vibration abatement				
6. Protection of biodiversity and landscape	24 007	7%	25 486	7%
7. Protection against radiation			12 817	3%
8. Research and development				
9. Other environmental protection activities	189 771	55%	188 262	49%
<b>Total environmental protection</b>	<b>346 973</b>	<b>100%</b>	<b>386 595</b>	<b>100%</b>

Thus, total transfers to the RoW amounts to 347 Million SEK in 1991. This means that domestic transfers can be estimated to 372 Million. In 1995, the figures are 387 and 529 Million SEK respectively.

## 2.5 Environment Taxes

Environment taxes are interesting for several reasons: e.g. as a basis for calculating the environment related financial burden for different economic sectors, and especially from an efficiency point-of-view. For the public sector, one major concern is the size of the tax revenue. In the table below revenues of environment taxes (broad definition) in 1991-95 is presented. It seems more difficult to assess the distribution of the tax burden on different economic sectors, and this has not been pursued any further in this project.<sup>5</sup>

*Table 10. Taxes on environment, energy and transport 1991-1995 (SEK Million)*

	Taxes included	1991	1992	1993	1994	1995
<b>1</b>	<b>Energy and environment consumption taxes</b>	<b>17 348</b>	<b>17 206</b>	<b>16 574</b>	<b>19 023</b>	<b>19 187</b>
1,1	Energy consumption and CO <sub>2</sub> tax	15 642	15 505	14 809	17 399	17 385
1,1,1	electrical tax	6 255	6 199	5 683	5 977	6 101
1,1,2	fuel tax	4 376	3 421	2 198	2 618	4 699
1,1,3	CO <sub>2</sub> tax	5 491	5 851	6 572	6 913	6 876
1,2	Special tax on petroleum products etc.	129	117	99	137	133
1,2,3	nuclear power	129	117	99	137	133
1,3	Special tax on acidification	67	63	59	62	69
1,4	Environment tax on domestic flight	159	167	191	271	177
1,5	Sulphur tax	306	196	191	332	183
1,6	Tax on electricity from certain sources	894	1 031	1 026	817	908
1,7	Environment tax on fertilisers and biocides	151	127	199	183	332
<b>2</b>	<b>Taxes on road vehicles</b>	<b>27 059</b>	<b>26 320</b>	<b>29 942</b>	<b>27 820</b>	<b>28 660</b>
2,1	Sales tax on motor vehicles	1 583	1 414	1 270	1 723	1 752
2,2	Petrol tax	17 428	17 765	21 628	22 030	22 859
2,2,1	CO <sub>2</sub> tax	2 967	3 343	4 073	4 283	5 920
2,3	General road vehicle tax	4 272	3 772	4 095	4 064	4 049
2,4	Kilometre tax	3 431	3 003	2 737	10	
2,5	Travel tax	345	345	366	212	-7

<sup>5</sup> We also have information on total revenues for some fees directly financing EP activities.

## 3 Local Government

### 3.1 Introduction

Several important environmental protection areas in Sweden are the responsibility of local government, including areas with large expenditure such as waste and wastewater.<sup>6</sup> An important feature in Sweden is the organisation of the activities of local government. It is now quite common for these functions to be handled by municipal companies, not the least in the areas of waste and wastewater. There are also a few large private companies operating in the waste domain, and sometimes households pay for their services directly to these companies. This means that although waste and wastewater are the responsibility of public local authorities, much of the service is provided by enterprises. In the national accounts, these companies fall into NACE 90. But traditionally this expenditure has been referred to local government, and we have decided to include these activities in this study, and in the summary of public expenditure in section 4. In the future, though, a division of expenditure into public authorities and companies needs to be made corresponding to the national accounts definitions.

Existing data is restricted to a survey of environmental protection expenditure in municipalities in 1991. This survey is fairly complete and covers most of the EP activities in local government. It seems possible, however, to include information from sources not hitherto used, which could provide a basis for future coverage of the main areas of environmental protection in local government. Before this is possible these sources need to be analysed in more detail than has been possible in the line of this project. In this section data from the 1991 survey and data from external sources are presented under the respective EP area.

### 3.2 Wastewater Treatment Plants

Wastewater treatment is the responsibility of municipalities but the actual service is often performed by publicly owned companies. Therefore, the same arguments as for waste can be made for this domain. Statistics Sweden based data in the 1991 survey, on a survey by the Water and Wastewater Management Association (VAV). Apparently there is some degree of double counting in the latter survey. Statistics Sweden contacted individual plants, and corrected the figures for the majority of these cases. Thus, it is possible to compare data from the two sources for the year 1991, in order to study the degree of double-counting. For this particular year the magnitude was around five percent.

VAV publish data annually with expenditure for water and wastewater separated. At the moment we have access to data from 1991-1995. As regards data for 1995, a change in the VAV survey has occurred, which means that data for this year need to be analysed in more detail before it can be used. Since at the moment no new survey of the municipalities is planned, Statistics Sweden intend to use data from the VAV in the future. For the year 1991 we have as yet used data from the 1991 survey for reasons of continuity.

In the municipal accounts, waste and wastewater are not separated, but expenditure is broken down on types of expenditure. It might therefore be possible to use this source for additional information, and for checks of consistency. The data available for this area is summarised in table 11.

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<sup>6</sup> Although their dominance in part might depend on the fact that these areas are more easily covered than others.

Table 11. Expenditure for wastewater management 1991-1994 (SEK Million)

	1991		1992	1993	1994
	Statistics Sweden	VAV	VAV	VAV	VAV
Operating expenditure	3 005	3 100	3 165	3 184	3 211
CFC	1 990	2 147	2 266	2 291	2 354
Total current expenditure	4 995	5 247	5 431	5 475	5 565
GFCF	2 396	2 545	2 529	2 427	2 246
Total expenditure	7 391	7 793	7 960	7 902	7 811

In the figures above, current expenditure is not broken down into compensation of employees and intermediate consumption. First estimations for the year 1991 were made in the line of another project, using averages for this activity. Output is market, since current expenditure is supposed to be covered by fees. In practice coverage by fees is on average 98%. In Sweden we have a joint water and wastewater fee, which makes it hard to compare costs with revenues. Mainly household, but also industry, finance this activity, but it is at present not possible to decide the distribution between sectors. Estimations for the year 1991 were made in the SERIEE test application. Following the same estimation procedure, households are estimated to pay 4.403 + 1.101 in non-deductible VAT in 1991. Enterprises are estimated to pay 592 in fees.

### 3.3 Municipal Heating Plants

Data refers only to the 1991 survey. Current expenditure equalled 60 MSEK, while investments amounted to 215 MSEK. We have no information on revenues. Output is as yet treated as non-market and is therefore attributed to public final consumption. Expenditure for this area have been attributed to domain 1. "Protection of ambient air and climate". In the municipal accounts there is no information of that part of total expenditure that is directed towards environmental protection.

### 3.4 General Administration

In the 1991 survey General Administration was divided into three areas, focusing on expenditure data, total current expenditure for EP equalling 821 MSEK. But there is also some information on revenues. Revenues can be divided into revenues from fees, and from some specific government grants. Since transfers from central government to Swedish receivers have been excluded so far in the analysis there is no risk of double-counting. The same goes for measures financed by fees, since the payments of fees are not covered in the statistics of EP as yet.

#### 1. Departments for environmental protection (CE + rent)

For the departments for EP there is a division of expenditure into areas. Some of these areas could be transformed to the environmental domains of CEPA. As the figures are uncertain, and only a small portion can be converted to domains, all expenditure has been assumed to be in domain 9. "Other Environmental Protection Activities". Total expenditure equals 386

Million SEK. We have some information on revenues, referring to fees partly financing environmental surveillance. This has not been incorporated in the calculations made so far.<sup>7</sup>

2. "Other" departments (CE + rent)

For "other" departments than the one above, there is no division of expenditure into areas. Total expenditure equals 132 Million SEK.

3. "Other" expenditure (excluding CE and rent).

"Other" expenditure than those above are deemed to be current, although it includes a very small amount of investments. There is a division into areas, most of which could be transformed into environmental domains. Since expenditure is rather small, and some of this would have been transferred to the domain other anyway, we have decided to follow the same procedure for all activities under the heading General Administration. Total expenditure equals 303 Million SEK. We also have some information on revenues. Some of the revenue is in fact government financing, and can be referred to government grants specified for environmental protection, already included in the table of government grants for 1991.<sup>8</sup> We have not included any revenues in our calculations as yet.

In municipalities, the departments for EP are usually parts of larger departments. The most frequent practice is a department responsible for both environmental protection and health aspects. This naturally makes it difficult to provide information of expenditure for EP separated, and makes the information available somewhat unreliable. In the municipal accounts survey, municipalities are asked to provide information of these areas separated. The results for 1994 and 1995 can be seen in the table below.

Table 12. Expenditure in the departments for EP in local government (SEK Million)

Type of expenditure/ Source of information	1991	1994	1995
	Survey	Municipal accounts	Municipal accounts
CE	88	140	323
IC	150	218	376
CFC	27	19	24
Current expenditure	265	377	722
GFCF	35	10	25
Total	300	387	747

The figures above could be compared with those from the 1991 survey. The large difference between the years could partly be explained by better estimation procedures for municipalities to distribute expenditure. But these area requires more in depth analysis than has been possible in the line of this project. This should include a more detailed study of data on the level of individual municipalities.

### 3.5 Waste Management

Municipalities are responsible for the collection, treatment, and disposal of household waste and other equivalent waste. They also have the freedom to decide to increase their responsibility to cover also other sorts of waste: e.g. industrial waste. Recently, a transfer of

<sup>7</sup> Incorporation of revenues via fees could probably be made partly via finance statistics, partly via information from annual financial accounts.

<sup>8</sup> In fact, much of the revenue can be referred to government grants specified for liming.

responsibility to producers has started. Although municipalities are responsible for this area, the organisation varies widely between municipalities:

1. In some cases this service is executed by the public authority.
2. It has, however, been more and more common to transfer the execution to public companies. Often the public authority collects the waste-fee, and in turn pay the public company for the execution of the service, but sometimes the companies collect the fees directly from the users of this service.
3. There are also some large private companies performing these services. Sometimes they collect the waste-fee directly from e.g. households.

In the 1991 survey, expenditure is divided into household waste and industrial waste, waste incineration, and treatment of waste at heating plants. Operating expenditure in the 1991 survey was 3.809 Million SEK. The survey did not include CFC. This was estimated in the SERIEE test application to 271. Output is supposed to be covered by fees. GFCF was 481. In the test application it was estimated that households paid 3.480 + 870 in non-deductible VAT, and enterprises 600 in fees.<sup>9</sup>

Expenditure and revenues for waste management is included in the municipal accounts. The content depends on who collects the waste-fee. Whenever the municipality collects the fee, expenditure is included in the accounts.

- If the municipality executes the actual service, the fee will finance the municipalities own activities. This will show in the municipal accounts as expenditure for CE, IC, CFC and GFCF.
- If this function is performed by private or public companies, this will show as payments for external services in the accounts. This is treated as intermediate consumption in the table below.

What is excluded are those instances when a private or public company executes the service and collects the fee directly. Table 13 summarises figures from the 1991 survey and the municipal accounts.

*Table 13. Expenditure in the domain waste management in local government (SEK Million)*

Type of expenditure/ Source of information	1991		1994	1995
	Survey	Municipal accounts	Municipal accounts	Municipal accounts
CE		710	616	597
IC		2 315	2 203	2 357
CFC	271	174	216	223
Current expenditure	4 080	3 199	3 035	3 177
GFCF	481	231	304	214
Total	4 561	3430	3 339	3 391

Expenditure in the 1991 survey seems to be much higher than data from the municipal accounts. There are several possible explanations for this. One could be the re-organisation of this area the last few years, with more producer-responsibility. The main reason is probably the treatment of municipal companies and private companies, operating in this domain. Both the 1991 survey and the municipal accounts exclude private companies (as long as

<sup>9</sup> This is most likely an under-estimation and should probably be treated as a minimum.



municipalities do not collect the waste-fee!). The survey did however include public companies, and as mentioned above these are only included in the municipal accounts if they collect the fee directly.<sup>10</sup>

The relatively small share of capital expenditure and of CE also stands out in the table above. This too is related to the organisation in municipalities. In 1995 for example about 1/3 of total current expenditure can be referred to payments for external services. These payments naturally finance CE and GFCF at the provider of these services. The same problem is inherent in the 1991 survey.

If you study the figures for 1995 for individual municipalities, it is evident that this source provides only a basis for a more fuller coverage of this domain: large municipalities like Stockholm have no expenditure, and some have very small expenditure per capita. But private companies should not be included in public expenditure data anyway, and the same goes for public companies as well, according to national accounts definitions. This means that the annual accounts actually would provide a good basis for expenditure incurred by local government. It seems imperative to investigate this source further, though, before including information more regularly, especially in order to provide more reliable divisions of total expenditure. And the main focus should be payments for external services. It is evident, nonetheless, that this source covers a large share of total expenditure in local government in the waste domain. Since no new survey of EPE in municipalities is planned, we plan to base data on this source in the future.

The municipal accounts 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 this activity should be covered by fees. From the figures in the municipal accounts we see that external fees cover about 70 percent of current expenditure. If we disregard expenditure for transgressing activities distributed to this activity, coverage by fees is almost 90 percent. We also see that a small part of capital expenditure is financed via government grants.

*Table 14. Financing in the domain waste management in local government in 1995 (SEK Million)*

<b>Current</b>	
External fees	2 327
External rent	3
Other external revenues	365
Internal revenues	403
Total	3 098
<b>Capital</b>	
Government grants	20
Other	220
Total	240

<sup>10</sup> Expenditure linked to municipal heating plants is shown separately in the municipal accounts. As mentioned, some expenditure linked to waste have been included in the figures for 1991.

## 4 Public Sector Data for 1991

The SERIEE test application used data for 1991 which now have been revised in several aspects. Information from this project have supplied better and more detailed information mainly for existing data for central government. In the SERIEE test application all data for central government was referred to domain 9. What remains to be done here is a decision how to handle transfers to domestic receivers, which at the moment are excluded from the analysis.

In this section we have compiled information regarding central and local government into contributions to national expenditure (NEXP) from activities in these sectors in 1991. This can be seen in the table below divided into current and capital expenditure, and environmental domains. Please note that in the figures for local government are expenditure for areas where local government is responsible, but where actual expenditure is incurred by publicly owned companies executing these services.

*Table 15. Contributions to NEXP from activities in general government in 1991 (SEK Million)*

CEPA	Current Expenditure			Capital expenditure			NEXP
	CG	LG	GG	CG	LG	GG	GG
1.	103	60	163	41	215	256	419
2.	36	6 096	6 132	2	2 396	2 398	8 530
3.	10	4 950	4 960	3	481	484	5 443
4.	114		114	3	0	3	117
5.	0		0	0	0	0	0
6.	300		300	70	0	70	370
7.	19		19	5	0	5	24
8.	82		82	23	0	23	105
9.	621	821	1 442	77	0	77	1 518
Total	1 284	11 927	13 211	223	3 092	3 315	16 526

It is also possible to break up the total contribution to NEXP, 16.526 Million SEK, according to financier:

- 1 Households pay fees for their use of services in the domains waste and wastewater, including VAT, equalling 9.854 Million SEK.
- 2 Enterprises pay fees for the same use equalling 1.192 Million SEK.
- 3 Final consumption in central government + GFCF in specialised producers in CG total 1.507 Million SEK.
- 4 Final consumption in local government + GFCF in specialised producers in LG total 3.973 Million SEK.

## 5 Concluding Remarks

This project has provided some very useful inputs to possible future work regarding environmental protection expenditure in the public sector. Both regarding possibilities of adaptation of existing data, but more importantly for possible inclusions of new and improved annual data.

For central government, it seems possible in the future to set up a more regular production system for the grants specified for environmental protection, on the lines of the adaptations presented in this report. Next year a revised table of government grants could be compiled for 1998, at the same time as data for 1997 is converted to expenditure, and broken down on environmental domains and types of expenditure. Based on the findings of this project this could probably be done with a reasonable input of resources. What remains to be done here is mainly a decision how to proceed with the transfers to domestic receivers.

But for this to be worthwhile, a more complete picture of central government is imperative: i.e. inclusion of activities financed by general grants and by fees. Earlier research has shown that the size of these activities are of major importance. These aspects of the public sector has not been possible to cover in the lines of this project. The work done here has however given some useful inputs as regards possibilities to cover these in the future. One possibility is a systematic study of annual financial reports for the most important public authorities. These financial reports contain more and more detailed information and could be very useful, as has been shown in this project. There is also some information in finance statistics of the size of revenues for those fees which directly finance environmental protection.

For local government, it seems possible to base future data on annual municipal accounts, and on the survey by VAV. Through the use of these sources it would be possible to provide annual data for wastewater, waste management and the departments for EP. In the 1991 survey these three areas constituted more than 90 percent of total expenditure in local government. Before this is possible a more detailed analysis is necessary. This would provide input to what complimentary studies need to be made, both in order to provide a complete picture of expenditure in local government, but also for a complete picture of the domains waste and wastewater. This would involve a more detailed study of public companies operating in these areas, but also on the few large private companies involved in waste management. Information on specialised private companies could be found in their annual financial reports.

Quite clearly a lot remains to be done as concerns public sector expenditure data. As has been mentioned, we will now evaluate the results of the work done, and implications for the future. A first decision of what data to provide, and in what detail, will be made later this year. Right now a follow-up project has started with the aim of publishing new public sector data for the year 1995.