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Refined Environmental protection expenditures in Sweden

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Statistiska centralbyrån
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Preface

Statistics regarding environmental protection expenditure have been produced in Sweden since the early 1980s. During this time definitions and the purpose of environmental protection have changed frequently. The questionnaire design has changed extensively in just the past three surveys in order to meet the requirements from Eurostat.

The objective for this report is to examine if the present questionnaire design was sufficient enough to incorporate the updated definitions published in the Eurostat document ENV/01/3.6A approved in the Joint Meeting of the Working Group "Statistics of the Environment" and the Working Party "Economic Accounts for the Environment". The updated definitions of investment variables 21 11 0 (pollution treatment investments) and 21 12 0 (pollution prevention investments) were examined.

This report investigates the possibility of producing data, as the suggested extension of the SBS regulation 58/97 would like to see. This suggested extension would mean that both investments and current expenditure would be divided into two further domains, Soil and groundwater and also Protection of biodiversity and landscape. The second extension regards finer NACE groups. A three digit NACE would be used for NACE 21, 23 and 24. This means that NACE 21 (pulp and paper), NACE 23 (coke and petroleum) and NACE 24 (chemicals) will be examined in 12 different groups instead of three. Analysis and interpretation of the 2001 year survey is also included. Data presented in Tables 1-4 are including 1-19 employees. The tables contain classified information that is marked with gray lines.

Nancy Olsson has prepared this report. The European Commission DG Environment has contributed financially to the project.

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Summary

This report presents the work of implementing the extension of SBS regulation 58/97 and also incorporating the updated definitions of environmental protection expenditure.

A sample of 1120 enterprises within NACE 10-36 and 40-41 was examined to find out how the extension and new definitions could be incorporated into the Swedish questionnaire. The survey is relatively new and "the accounting of environmental protection expenditure thinking" is not incorporated into enterprise routines yet, which makes it important to maintain the design of the questionnaire.

Regarding dividing investments into two further domains of Protection of soil and groundwater and Protection of biodiversity and landscape, the design was sufficient. Dividing current expenditures into the two domains proved to be time consuming. Enterprises felt that the information given in the questionnaire was sufficient, so few text comments were given. In order to improve this situation, information about the vitality of text comments needs to be emphasised. However, Swedish enterprises are not spending much in order to protect soil and groundwater nor to protect biodiversity and landscape. Considering the result of 2001 year survey it is not motivated to record separately either current expenditure or investments in these two domains.

An information brochure, a web site and other means of helping respondents received a good response from users. It did not decrease the amount of time spent on the phone clearing up misunderstandings and extracting further information from enterprises that had not answered the survey properly. However, the new definitions of pollution treatment and pollution prevention investments received several positive reactions from respondents.

The response rate for the survey of 2001 was over 80%. The response rates in two stratums were absolute. This means that quality also rises. Unfortunately it was not enough to help the total quality measure of the mean standard error.

Response rate

	Enterprises	Employees
Population	4 589	641 794
Selection	1 109	460 978
Answer	898	399 859
Answer /population	20%	62%
Answer / Selection	81%	87%

Regarding mean standard error, the natural variance of investments and current expenditure keep that measure of quality quite low. About half of all respondents said that no investments had been conducted during 2001. This means that large amount of zeros cover the data material. Similarly, many respondents had waste management as only current expenditure for protective work. This is however a problem that could be dealt with when enough data for time series has been collected. Estimations can then be conducted to account for depreciation of value for previous investments and a smaller variance would then help with quality measures such as the mean standard error.

In the case of presenting NACE 21, NACE 23 and NACE 24, the results were different in the three different groups. NACE 21 could without any problems be divided into NACE 21.1 (manufacturing of pulp and paper) and NACE 21.2 (manufacturing of articles of paper and paperboard).

NACE 23 could unfortunately not be divided into a three digit NACE. There are not enough enterprises in this industry for finer groups.

NACE 24 could in this survey not be divided into a three digit NACE for all seven groups. The main reason for this is that the response rate was not sufficient for the presentation.

Increasing amount of expenditure for environmental protection activities was shown for 2001. Investments increased by over SEK 2 billions compared with the survey for 1999/2000. Pollution treatment investments increased by SEK 436 million and accounted for almost 50 percent of total investments. Total current expenditure for environmental protection activities accounted for 63 percent of total environmental protection expenditures, which was almost equal to the previous survey.

NACE 21 (manufacturing of pulp and paper) and NACE 40 (Electricity, gas and hot water) were the main investors for the year 2001. These industries also had high current expenditures.

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1. Introduction

1.1. Background

Even after three surveys regarding environmental protection expenditure some enterprises in Sweden find the questionnaire complicated and time consuming. The first survey that treated environmental protection expenditure in its most recent form was conducted for the year 1997. The following survey 1999/2000 had a different design and also only dealt with three variables: end-of-pipe equipment, integrated technology and total current expenditure, compared with 12 pages of questions for 1997. Attempts to stabilise the survey, both for the respondents and for Statistics Sweden's sake were a matter of great importance. Changes in questionnaire design can lead to confusion and it is more difficult to standardise statistical calculation programs for quicker results.

When Eurostat suggested extending the SBS regulation 58/97 it was felt from Statistics Sweden's side that it should be possible to produce new statistics without interfering too much in the design of the questionnaire.

1.2. Objective

The main objective for this report is to examine if the present questionnaire design is sufficient to incorporate the updated definitions published in the Eurostat document ENV/01/3.6A. This document was approved in the Joint Meeting of the Working Group "Statistics of the Environment" and the Working Party "Economic Accounts for the Environment", to enable consistency and better quality of the survey "environmental protection expenditure".

An additional objective is the incorporation of the suggested extension of the SBS regulation 58/97. Results from the 2001-year survey are published along with analysis of these results.

1.3. Structure

This report is divided into three parts. The first part deals with the questionnaire and quality of data collected. The second part investigates the suggested extension of SBS regulation 58/97 regarding the protection of soil and groundwater and for biodiversity collected from the survey. The last part in this report deals with the extended NACE groups of sampled enterprises. Tables and the questionnaire are in annexes one and two.

2. Questionnaire

The most recent form of the questionnaire regarding environmental protection expenditures is fairly new. The survey was easier for enterprises in the beginning of the 1980s when definitions of environmental protection expenditure were different. The questions were of such a format that they could be answered with just a number. This meant that quality could be checked. The survey disappeared for a few years until 1998. By then definitions and the structure of collecting data had changed. The new form and the new definitions required a modified survey. More than data was required. The result for environmental protection expenditure of 1997 was daunting. The previous response rate had been well over 80%, and now it fell to 40%. As the 1997-year survey was the first in several years, it was considered a pilot study. The objective for the pilot study was to examine how many variables and how much information was required to achieve good data quality. The following survey (1999/2000) was based on the same method but only dealt with the basic procedure of collecting needed variables such as 21 11 0 pollution treatment investments, but also variable 21 12 0 pollution prevention and 21 14 0 total current expenditure. The response rate increased to 60% of the sample replying. At this stage, it was felt that the design of the questionnaire should not be altered too much in following years. In preparation for the survey of 2001 an information brochure was prepared, inviting enterprises and authorities were invited to a seminar, and a new law was passed to make the survey compulsory. A problem with the previous surveys had been accounting for current expenditures. It had proven to be difficult to distribute operating costs, control and maintenance into four of the CEPA domains. Each questionnaire had to be manually checked and corrected when misunderstandings were apparent. For the survey of 2001 it was decided that at least the question design should change and become more obvious. The end result of the design for the survey of 2001 was that only one extra question had been introduced, which covered economising with energy and heat recycling (see annex 2). This question was added after discussions at the seminar held in autumn 2001; otherwise the survey stayed the same as the previous year.

2.1. Data quality

Considering all the advance preparation of the survey “Environmental protection expenditure 2001” data quality was expected to improve a great deal. Before the final distribution of the questionnaire, a help brochure had been developed, with information about the origin of environmental protection expenditure and how to actually fill in the questionnaire. Also a “warning” letter had been sent out a few months earlier to the sampled enterprises. To provide additional help, Statistics Sweden created a web-site, both in Swedish and in English with updated information regarding legislation, describing the new survey that was about to be sent out and a question box where people or enterprises could ask any type of question related to environmental protection expenditure.

An introductory letter, an accompanying brochure, a list of all working places that should be included in the answer and the questionnaire itself were sent out in February and the last date for return was the end of April. One letter of reminder was sent out in the beginning of April. This time was chosen because by then the environmental reports that enterprises in Sweden compile ought to have been completed.

The previous survey had had some difficulties in receiving information about the entire enterprise. More often than not, the answer for only one work place was included and time was spent unnecessarily to determine whether remaining work places actually had done any investments or had any current expenditure for environmental protection. In order to prevent this from happening again a list of every working place was included for those enterprises with more than one working place. It is uncertain if this list made an impact as the same situation occurred as with the last survey. When asked why they had only given an answer for one work place, most enterprises said that the person who had been given the questionnaire had not been given all the information for their own enterprise. The questionnaire had in most cases circulated from desk to desk before settling with someone. If the possibility to extract information from certain work places was limited, estimations were based on the number of employees for the whole enterprise. Avoiding this scenario in the future can be difficult but not impossible. Every year so far a list with contact persons has been compiled in order to prevent this from happening. People changing jobs, retiring and so forth is nonetheless a continuous problem.

Many small enterprises state ordinary waste management as the only expenditure they have for environmental protection. About 20 percent of respondents stated that the only current expenditure for environmental protection was bought waste management.

Slightly less than 47 percent of respondents claimed that they had not invested in any type of environmental equipment during 2001. Of these enterprises 74 percent had less than 250 employees. From a statistical perspective so many zeros create a problem. The standard variation is affected as the variation of investments within one stratum is quite large and therefore the mean standard error is also affected.

6 percent of surveyed enterprises claimed that they had made no investments and that they did not have any current expenditure for environmental protection activities. Of these, 83 percent had less than 250 employees. This can be explained by the fact that many smaller enterprises pay for waste management through their rent and can therefore not account separately for this type of cost. Smaller enterprises, especially in NACE 22 (publishing, printing and reproduction of recorded media) and NACE 41 (water supply) also do not have all that many polluting activities.

Despite efforts to increase the quality of the mean standard error, the total was the same as previous year's survey. Improvements could be seen when looking at each NACE group on it's own. The mean standard error for investments improved from an F to an E, which means that variances decreased from the interval 50-100% to 20-50%. For current expenditures, mean standard error decreased from an E to a D, which gives an interval between 10-20%.

Enterprises in NACE 21 were the main investors and they represented 30 percent of total investments during 2001. Next largest was NACE 40, which represented 22 percent of total investments. Of a total of SEK 3.6 billion, approximately 50 percent was invested in pollution treatment and pollution prevention investments (see Table 1 in annex 1).

Splitting investments into pollution treatment and pollution prevention by number of employees shows that enterprises with employees between 50 and 999 invest similarly. Also smaller enterprises with 1-49 employees invest in a similar fashion for 2001. Large enterprises of more than 1000 employees invest both in protective and treatment equipment (see Table 7 in annex 1).

Current expenditure represented 60 percent of total environmental protection expenditure. NACE 21, NACE 40 and NACE 24 together represented 45 percent of total current expenditures. NACE

40 increased current expenditure by about 50 percent, compared with the 1999/2000-year survey. The main reason for this is that nuclear power plants are included in the survey of 2001. Nuclear power plants have substantial expenditure for waste management (see Table 3 in annex 1). Despite the fact that CEPA 2000 classification say that measures of radioactive waste should be classified in the domain Radiation and not in the domain waste, Statistics Sweden chose to present data in the domain of waste management. The reason for this is that this show very clearly how substantial expenditures the nuclear power plants have for dealing with all types of waste compared with previous year when this group was not included in the survey. If Sweden had presented the nuclear waste in the domain Radiation, which is under the domain Other it would have been difficult to distinguish nuclear waste from other types of expenditures. Another reason for presenting nuclear waste in the domain for Waste management is that the nuclear power plants accounted both non hazardous, low level of radioactive waste and hazardous radioactive waste together. The nuclear power plants were not included in the calculations for bringing data up to national level because of the great impact their current expenditures would have on NACE 40.

Current expenditure by number of employees shows that again enterprises with between 50-999 employees have very similar amount of expenditures 2001. Enterprises with 1000 or more employees have very high expenditures for environmental protection (see Table 7 in annex 1).

3. Environmental domains

3.1 Investments

Distributing environmental protection investments into six domains according to CEPA classifications without changing the design of the questionnaire proved to be difficult. The six domains were: Protection of ambient air and climate, Waste Water management, Waste management, Protection of Soil and Groundwater, Biodiversity and landscape, and Other environmental protection activities.

A considerable number of replies had reasonably good text comments on what type of investments had been made during the previous year. This meant there was sufficient information for determining what "other" investments were. This however does not mean that publishing statistics with six environmental domains is of great importance in Sweden. Hardly any investments are done in the two new domains. About 2 percent of total investments could be referred to the protection of soil and groundwater and 3 percent came from the protection of biodiversity and landscape. A total of 310 million SEK was invested in "other" investments. Breaking these investments into additional two domains, by industry and by type of investment, decreases the quality of measurement error significantly (see Table 4 in annex 1).

3.2 Internal current expenditure

In order to divide current expenditure into six environmental domains, many enterprises had to be contacted as expected. Regarding internal expenditures, which already are divided into four domains, it was possible to separate further. Distributing protection of soil and groundwater, biodiversity and other was however only possible after contacting enterprises, as hardly any text comments were written for current expenditure. Enterprises who were asked why they did not write any comments for current expenditure mainly all replied that they felt that the text already given by Statistics Sweden was clear and sufficient enough and that no extra comments were therefore needed.

Table 6 in annex 1 show that enterprises can account for only 0.3 percent of expenditures for soil and groundwater and even less towards the protection of biodiversity.

3.3 Bought current expenditure

Current bought expenditure was not easily dividable into six environmental domains. First, the Swedish enquiry is not structured to environmental domains in the same way as internal current expenditure. Bought services for maintenance, operations and control are only accounted for as one sum. This means that "other" is fairly difficult to divide into domains. The column that collects "other" domains, in the Swedish enquiry, is mainly for protection of soil and groundwater (soil decontamination) and for chemicals and material (see Table 4 in annex 1). It is possible to make statistics out of the six environmental domains for bought expenditures, but it is quite costly. Some eighty enterprises had "other" bought current expenditures, but the way that the database is constructed makes it time consuming to define all eighty enterprises and what sort of current expenditure they have had for the protection of soil and groundwater and for biodiversity during the past year.

4. Extension of NACE division

No increase of enterprise sample was needed to break down enterprises into a finer NACE division. Almost 1120 enterprises were included in the survey of 2001 environmental protection expenditure in industry. The previous sample had been drawn with the principle that 100 percent of the population was sampled if enterprises had 250 employees or more, and the same method was applied in this recent sample. 50 percent was chosen if there were between 100-249 employees, 20 percent if an enterprise had 50-99 employees and 5 percent were selected if enterprises had 20-49 employees.

It was necessary to lower the cut-off limit of 20 employees in some industries to be able to fully receive good quality data. For example a full-scale survey was done on NACE 11 (extraction of raw petroleum) as it only consisted of 8 enterprises with 19 employees or less. NACE 41 was also a full-scale survey. This was to learn whether these groups had any environmental protection expenditures or not in order to perhaps increase the cut-off point for coming surveys. Anther reason for selecting enterprises with less than 20 employees was to find out whether these groups had any types of environmental protection expenditures. As expected, NACE 11 did not show any investments or current expenditure. Since Sweden does not extract their own petroleum and natural gases, the enterprises within NACE 11 are service oriented. NACE 41, on the other hand, both had made investments and had current expenditures for 2001 (see Table 1 in annex 1) even though they were not so high.

The number of selected enterprises within NACE 22 was reduced by between 5-10 percent in the different strata. The reason for reducing the sample for NACE 22 is that almost all publishing industries outsource the actual printing to other industries. The total environmental protection expenditure for NACE 22 was only to SEK 188 million, which is only about 2 per cent of the total amount for all industries.

The total population in NACE 21.1 (manufacturing of pulp and paper) and NACE 21.2 (manufacturing of articles of paper and paperboard) was 295 enterprises. 64 enterprises were sampled with a cut-off at 19 employees. The survey received enough replies in both these groups for the results to be reliable for publishing.

NACE 23.1 (manufacturing of coke), NACE 23.2 (refined petroleum products) and NACE 23.3 (manufacturing of nuclear fuel) had a population of 30 enterprises of which 8 could be sampled. Of these three groups, only the NACE 23.2 results could be published. This however is impossible as NACE 23.1 and NACE 23.3 only had one enterprise each in their group.

The last three digit-level NACE 24.1(manufacturing of base chemicals), NACE 24.2 (manufacturing of pesticide and other agriculture chemicals), NACE 24.3 (manufacturing of paint, lacquer, printing ink, etc.), NACE 24.4 (manufacturing of pharmaceutical products and botanical products), NACE 24.5 (manufacturing of detergent and toilet requisites), NACE 24.6 (manufacturing of other chemical products) and NACE 24.7 (manufacturing of synthetic fiber) had a total population of 483 enterprises. 57 enterprises were selected. Of these, only the results for NACE 24.1, NACE 24.3, and NACE 24.4 can be published in their own groups, while none of the other groups received enough replies to be presented individually.

5. Conclusions and future work

Even though the statistical quality only improved marginally, enterprises seem to find the questionnaire somewhat easier to fill in. Many respondents understood the principle of filling in the questionnaire, since they had done this the year before. Some enterprises have started the work of updating their accounting system so that this survey will require less time to complete. Although many enterprises (mainly the larger ones) had been surveyed the previous year, many other enterprises were new. Especially the smaller enterprises in NACE 11 and in NACE 22 felt that they could not reply to this survey, as they did not have any real system for environmental issues. Their problem also lay in the fact that their amounts spent on environmental protection are not very high, but that reporting environmental expenditures would be costly.

A rather large proportion of enterprises, about 60 percent, had to be addressed for further information. Out of these 60 percent was 21 percent regarding issues of current expenditures made for the purpose of protecting soil and groundwater and protection of biodiversity and landscape. As can be seen in Table 4, investments for soil and groundwater plus biodiversity and landscape are together 5 percent of total investments. Internal current expenditure for soil and groundwater plus biodiversity is about 0.4 percent of total internal expenditure. Quality of measurement errors for both investments and current expenditure in these domains are not satisfactory. The measurement errors can be divided into three groups. Measurement errors that lie between A-C, which means that the variation is between 0 and10 percent, are considered excellent quality of variations. Measurement errors that lie between D-F, which means that the variation is between 10 and 100, percent are less good but acceptable. The last group consists of G, which means that there is a variation of 100 percent or more. With this in mind it can be arguable to not present finer domain groups in Sweden.

Regarding the extension of NACE groups, Sweden does not cover the entire field. NACE 21 could be presented at a finer level, but NACE 23 and some of NACE 24 cannot be presented at a finer level due to the classification of secrecy that applies to data from Statistics Sweden. This rule states, among other things, that a group must have at least three observations. The problem in Sweden is that there are not enough enterprises to collect statistics at a finer NACE level than is already collected at Statistics Sweden.

As the response rate returned to over 80 percent, the goal for next year's survey is around 90 percent. One issue for next year's survey is however the non-compulsory questions about current expenditures. The hope is that enterprises will reply to all questions just as they did for 2001, due to their new accounting systems.

Next year's survey will attempt to present finer NACE groups for NACE 24. Lowering the sample in NACE 28 (manufacturing of fabricated metal products, except machinery and equipment) and NACE 29 (manufacturing of machinery and equipment) will enable Statistics Sweden to increase the sample size in NACE 24 and also increase the sample size in NACE groups 10-14. However NACE 11 will not be included in the survey as mentioned before, since surveying this group can not be justified due to it's lack of expenditures.

In order to comply with CEPA 2000 regarding nuclear power plants and the high radioactive waste that they produce, the selected enterprises will be asked to separate these types of expenditures.

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Annex 1

NACE	Industry
10	Extraction of coal and peat
11	Extraction of raw petroleum and natural gas and connection services
12	Extraction of uranium and thorium mining
13	Mining of metal ores
14	Other mining and quarrying
15	Manufacture of food products and beverages
16	Manufacture of tobacco products
17	Manufacture of textiles
18	Manufacture of wearing apparel; dressing and dyeing of fur
19	Manufacture of leather and leather products
20	Manufacture of wood and wood products
21.1	Manufacture of pulp, paper and paperboard
21.2	Manufacture of articles of paper and paperboard
21	Manufacturing of pulp, paper and paper articles
22	Publishing, printing and reproduction of recorded media
23.1	Manufacturing of coke
23.2	Refined petroleum products
23.3	Manufacturing of nuclear fuel
23	Manufacture of coke, refined petroleum products and nuclear fuel
24.1	Manufacturing of base chemicals
24.2	Manufacturing of pesticide and other agriculture chemicals
24.3	Manufacturing of paint, lacquer, printing ink, etc.
24.4	Manufacturing of pharmaceutical products and botanical products
24.5	Manufacturing of detergent and toilet requisites
24.6	Manufacturing of other chemical products
24.7	Manufacturing of synthetic fibre
24	Manufacture of chemicals and chemical products
25	Manufacture of rubber and plastic products
26	Manufacture of other non-metallic mineral products
27	Manufacture of steel and iron
28	Manufacture of fabricated metal products, except machinery and equipment
29	Manufacture of machinery and equipment n.e.c.
30	Manufacture of office machinery and computers
31	Manufacture of electrical machinery and apparatus n.e.c.
32	Manufacture of radio, television and communication equipment and apparatus
33	Manufacture of medical, precision and optical instruments, watches and clocks
34	Manufacture of motor vehicles, trailers and semi-trailers
35	Manufacture of other transport equipment
36	Manufacture of furniture; manufacturing n.e.c.
40	Electricity, gas, steam and hot water supply
41	Water supply

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- Rows marked with gray in Tables 1-7 are for Eurostat only and not public presentation.
- Data are covering 1-19 employees in all tables.

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Table 1. Total environmental protection expenditure 2001 by cost type and industry, SEK million.

NACE	Investments (1)	RF	Current expenditures (2)	RF	Total expenditures (1+2)	RF
10						
11						
13						
14						
10-14	159	C	105	D	264	C
15						
16						
15-16	313	E	722	D	1035	D
17						
18						
19						
17-19	21	F	76	E	97	E
20	79	E	207	E	285	E
21.1	1084	D	979	C	2064	C
21.2	12	E	60	E	72	E
21	1096	D	1039	C	2136	C
22	87	G	101	E	188	F
23.1						
23.2						
23.3						
23	140	E	100	E	241	E
24.1						
24.3						
24.4						
24.5						
24.6						
24.7						
24	317	E	850	D	1167	D
25	63	F	218	E	281	E
26	33	E	189	E	222	E
27	210	E	607	D	817	D
28	112	E	402	D	514	D
29	132	E	407	D	539	D
30						
31						
30-31	32	E	111	D	143	D
32	7	E	104	E	110	D
33	26	F	65	F	91	F
34	121	E	344	C	465	D
35	38	F	85	D	124	E
36	24	E	90	E	114	E
40	860	F	864	E	1724	E
41	20	A	41	A	61	A
Total	3890	D	6728[1]	C	10618	C

Measure for the uncertainty is presented in the relative margin of error, RM, (2 x the coefficient of variation) in per cent with a letter from A-G, according to: A = 0 % - 2 %, B = 2 % - 5 %, C = 5 % - 10 %, D = 10 % - 20 %, E = 20 % - 50 %, F = 50 % - 100 % and G = 100 % + .
Two dots (..) means that data are not available or are too uncertain to present. Gray areas are classified with secrecy.

[1] Expenditure for wastewater is included. Expenditure taken from preliminary report; Water accounts 2000.

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Table 2. Investments in environmental protection 2001 by type of investment and industry, SEK million.

NACE	Pollution treatment investment (1)	RF	Pollution prevention investment (2)	RF	Total EPE investment (1+2)	RF
10						
11						
13						
14						
10-14	141	C	17	D	159	C
15						
16						
15-16	195	F	118	E	313	E
17						
18						
19						
17-19	5	G	16	F	21	F
20	47	F	32	F	79	E
21.1	504	E	580	E	1084	D
21.2	9	E	3	E	12	E
21	513	E	583	E	1096	D
22	74	G	13	G	87	G
23.1						
23.2						
23.3						
23	58	E	82	E	140	E
24.1						
24.3						
24.4						
24.5						
24.6						
24.7						
24	212	E	105	E	317	E
25	57	F	6	F	63	F
26	24	E	9	F	33	E
27	122	E	88	E	210	E
28	74	E	38	F	112	E
29	50	E	82	F	132	E
30						
31						
30-31	12	E	20	E	32	E
32	3	E	4	F	7	E
33	7	F	18	F	26	F
34	27	E	94	E	121	E
35	9	E	30	F	38	F
36	16	F	8	F	24	E
40	291	E	569	F	860	F
41	3	A	17	A	20	A
Total	1939	D	1951	E	3890	D

Measure for the uncertainty is presented in the relative margin of error, RM, (2 x the coefficient of variation) in per cent with a letter from A-G, according to: A = 0 % - 2 %, B = 2 % - 5 %, C = 5 % - 10 %, D = 10 % - 20 %, E = 20 % - 50 %, F = 50 % - 100 % and G = 100 % + .
Two dots (..) means that data are not available or are too uncertain to present. Gray areas are classified with secrecy.

Table 3. Total investments 2001 by domain and by NACE, SEK million.

NACE	Air	RF	Water	RF	Waste	RF	Other	RF	Soil	RF	Biodiversity	RF
10												
11												
13												
14												
10-14	30	F	18	E	69	F	2	F	0	F	40	F
15												
16												
15-16	111	E	88	F	38	E	10	F	4	F	62	G
17												
18												
19												
17-19	2	G	7	F	2	F	9	G	2	G	0	A
20	29	F	9	F	13	F	22	F	5	F	0	A
21.1	320	E	642	E	101	E	13	E	8	F	0	F
21.2	1	E	5	E	5	E	0	E	0	F	0	A
21	321	E	647	E	106	E	14	E	8	F	0	F
22	60	G	10	G	16	F	0	G	0	A	0	A
23.1												
23.2												
23.3												
23	92	E	43	E	1	E	1	E	3	E	0	A
24.1												
24.3												
24.4												
24.5												
24.6												
24.7												
24	231	E	61	E	18	E	2	F	5	E	0	A
25	33	G	21	G	6	G	1	G	2	G	0	A
26	11	F	9	F	9	E	3	F	2	F	0	A
27	86	F	63	E	47	F	4	F	10	F	0	A
28	48	F	34	E	8	G	13	G	8	G	0	A
29	85	F	20	E	17	E	4	E	6	F	1	G
30												
31												
30-31	20	E	4	F	5	E	1	F	1	F	0	A
32	1	F	4	F	2	E	0	F	0	F	0	A
33	14	F	11	G	1	F	0	G	0	G	0	A
34	88	E	16	F	9	E	8	F	1	F	0	A
35	30	F	5	F	3	E	0	G	1	F	0	A
36	16	F	2	F	1	F	4	F	0	G	0	A
40	664	F	75	F	72	F	1	G	28	F	20	G
41	1	A	18	A	0	A	0	A	0	A	0	A
Total	1972	E	1163	D	445	E	100	E	88	E	122	F

Measure for the uncertainty is presented in the relative margin of error, RM, (2 x the coefficient of variation) in per cent with a letter from A-G, according to: A = 0 % - 2 %, B = 2 % - 5 %, C = 5 % - 10 %, D = 10 % - 20 %, E = 20 % - 50 %, F = 50 % - 100 % and G = 100 % + .
Two dots (..) means that data are not available or are too uncertain to present. Gray areas are classified with secrecy.

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Table 4. Total current expenditure on environmental protection 2001 by cost type and industry, SEK million.

NACE	Internal current expenditure for EPE (1)	RF	Payments and fees (2)	RF	Total (1+2)	RF
10						
11						
13						
14						
10-14	69	E	36	D	105	D
15						
16						
15-16	231	E	490	D	722	D
17						
18						
19						
17-19	29	F	48	E	76	E
20	71	E	136	E	207	E
21.1	637	C	342	C	979	C
21.2	31	E	30	E	60	E
21	668	C	372	C	1039	C
22	40	F	61	F	101	E
23.1						
23.2						
23.3						
23	64	E	36	D	100	E
24.1						
24.3						
24.4						
24.5						
24.6						
24.7						
24	438	E	412	D	850	D
25	102	F	115	E	218	E
26	92	E	97	D	189	E
27	347	E	260	D	607	D
28	181	E	221	D	402	D
29	180	D	227	E	407	D
30						
31						
30-31	63	E	48	D	111	D
32	62	E	42	D	104	E
33	42	F	24	E	65	F
34	162	D	182	D	344	C
35	37	E	48	E	85	D
36	46	E	44	E	90	E
40	439	E	425	F	864	E
41	32	A	9	A	41	A
Total	3394	C	3334[2]	C	6728	C

Measure for the uncertainty is presented in the relative margin of error, RM, (2 x the coefficient of variation) in per cent with a letter from A-G, according to: A = 0 % - 2 %, B = 2 % - 5 %, C = 5 % - 10 %, D = 10 % - 20 %, E = 20 % - 50 %, F = 50 % - 100 % and G = 100 % + .
Two dots (..) means that data are not available or are too uncertain to present. Gray areas are classified with secrecy.

[2] Expenditure for wastewater is included. Expenditure taken from preliminary report; Water accounts 2000.

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Table 5. Total current expenditure 2001 by domain and NACE, SEK million.

NACE	Air	RF	Water	RF	Waste	RF	Other	RF
10								
11								
13								
14								
10-14	25	F	32	B	14	C	35	D
15								
16								
15-16	19	E	322	D	230	D	150	E
17								
18								
19								
17-19	2	F	21	E	31	E	23	F
20	16	F	15	D	81	E	95	F
21.1	114	D	406	D	175	D	283	D
21.2	1	E	21	E	22	D	16	E
21	115	D	427	D	197	C	299	D
22	1	F	8	C	42	F	51	F
23.1								
23.2								
23.3								
23	21	E	33	E	17	E	29	D
24.1								
24.3								
24.4								
24.5								
24.6								
24.7								
24	63	E	277	D	293	E	217	D
25	20	F	36	E	80	D	81	F
26	19	F	29	D	80	E	61	E
27	123	E	201	D	142	E	140	E
28	24	F	84	E	164	E	130	E
29	20	E	59	D	142	D	185	E
30								
31								
30-31	5	E	13	E	38	D	54	E
32	7	E	23	E	30	E	43	D
33	6	G	14	F	22	F	24	F
34	34	E	54	C	163	D	93	C
35	3	E	15	E	28	D	39	E
36	7	F	13	E	37	E	33	E
40	115	F	72	F	352	F	325	F
41	0	A	30	A	8	A	2	A
Total	644	D	1780	C	2193	D	2111[3]	D

Measure for the uncertainty is presented in the relative margin of error, RM, (2 x the coefficient of variation) in per cent with a letter from A-G, according to: A = 0 % - 2 %, B = 2 % - 5 %, C = 5 % - 10 %, D = 10 % - 20 %, E = 20 % - 50 %, F = 50 % - 100 % and G = 100 % + .
Two dots (..) means that data are not available or are too uncertain to present. Gray areas are classified with secrecy.

[3] Bought current expenditures for maintenance, order and control are included in Other .

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Table 6. Environmental protection expenditure 2001, by environmental domain, SEK million.

	Air	RF	Water	RF	Waste	RF	Other	RF	Soil	RF	Biodiversity	RF	Total	RF
Investments	1972	E	1163	D	445	D	100		88	E	122	F	3890	D
Pollution treatment	608	E	731	D	334	E	64		81	E	121	F	1939	D
Pollution prevention	1364	E	432	E	111	E	36		7	E	1	G	1951	E
Internal current expenditure	644	D	1059	C	495	D	1182[4]	D	12	F	2	G	3394	C
Bought current expenditure	-	-		[5]	1698	D	916[6]	D	-	-	-	-	3334	C
Total EPE	-	-	4105	D	1903	D	2198	D	-	-	-	-	10618	C

Measure for the uncertainty is presented in the relative margin of error, RM, (2 x the coefficient of variation) in per cent with a letter from A-G, according to: A = 0 % - 2 %, B = 2 % - 5 %, C = 5 % - 10 %, D = 10 % - 20 %, E = 20 % - 50 %, F = 50 % - 100 % and G = 100 % + .
Two dots (..) means that data are not available or are too uncertain to present. Gray areas are classified with secrecy.

Table 7. Total environmental protection expenditure by number of employees, SEK million

	1-19	20-49	50-249	250-499	500-999	1000+
Pollution treatment investments	178	4	308	343	353	753
Pollution prevention investments	138	15	327	368	171	932
Current expenditure	572	77	897	1258	1434	2490
Total EPE	888	96	1532	1969	1958	4175

[4] Administrative expenditures, education and R&D, are included.
[5] Due to the system of water accounts, no measurement error has been produced for the industry.
[6] Maintenance, operation, control, administrative expenditures along with education and R&D are included.

Statistiska centralbyrån
Statistics Sweden

Annex 2

Information provided on this form is confidential under chap. 9 sec. 4 of the Official Secrets Act (SFS 1980:100)

The respondent is liable to supply information regarding investments and current expenditure under the law of Official statistics (SFS 2001:99)

This form has been drawn up in consultation with the Board of Swedish Industry and Commerce for Better Regulation

REPLY FORM
Environmental protection expenditure for enterprises 2001

Please return this form **no later than 26 April 2002** using the enclosed business reply envelope or to the address below:

. . .

. . .

Statistiska centralbyrån
MR/MI JZ
Box 24 300
104 51 STOCKHOLM

Environmental protection expenditure 2001

This survey asks questions about spending by enterprises on measures to reduce various types of environmental impacts. Examples include measures to reduce emissions and discharges, dispose of and treat waste, reduce noise pollution, etc.

A Environmental protection investments
B Economising with natural resources (voluntary information)
C Current expenditure for environmental protection

Depreciation/write-offs and payments of general environmental taxes (e.g. CO_2 tax and waste tax) are not included in this survey.

Measures taken to meet technical, health or safety requirements or for purely economic reasons are not included in this survey, even though they can benefit the environment.

The deciding factor regarding reporting leasing is whether the expenditure have been capitalized (then investment) **in the enterprise or been charged on the profit for the year** (then current expenditure) **.**

Responses even from enterprises that have had no costs are very important for the quality of this surveys results.

Examples and suggestions within the different domains can be collected from Statistics Sweden web page www.mkost.scb.se

Person to contact at enterprise

Name of person to contact (PLEASE PRINT)	Position	Date
Address (if dirrerent from above)		Telephone (area code and subscriber's number)
Email		Fax

Activity of enterprise

State production processes, product or equivalent

Number of employees 2001

SCB M/MI 180 E. SCB-Tryck, Örebro 2001-11

This form is issued by	Persons to contact	Telephone (best 09.30–11.30 a.m.)	Email	Fax
	Peter Fränngård	**08 - 506 945 35**	**peter.franngard@scb.se**	
Environment Statistics	**Nancy Olsson**	**08 - 506 940 97**	**nancy.olsson@scb.se**	**08 - 506 947 63**

Statistiska centralbyrån
Statistics Sweden

1 Pollution treatment investments

The distinguishing feature of pollution treatment investments is that they do not affect the production process itself. They consist of distinct, identifiable components supplementing the equipment used in production. Their purpose is to take care of and to treat the impact on the environment caused bythe activities of the enterprise, to prevent thespread of and measure the level of pollution.

Examples in different environmental domains

Air

– Different types of filters, scrubbers, cyclones, centrifuges, etc.
– Coolers and condensers to treat process gases
– Equipment for thermal and catalytic combustion of process gases and other measures involving combustion technology
– Measures to restrict dust problems in connection with transport and storage
– Measurement equipment

Water

– All investments in own wastewater treatment plants
– Dams and tanks for storage of wastewater
– Oil separators, sedimentation basins, neutralisation basins, etc.
– Taking care of and treating sludge
– Costs associated with connection to municipal wastewater treatment plants
– Measurement equipment

Waste

– Equipment for own storage and transport, e.g. special vehicles, containers, transshipment stations, sorting equipment
– Equipment for own treatment, e.g. compressors and all investments in own landfill

Other

– *Noise pollution:* different materials and measures to reduce noise pollution, e.g. enclosure of equipment, sound-proofing, noise barriers, etc.
– *Soil and groundwater:* soil decontamination and protection of soil and groundwater from pollutants, e.g. by building embankments, firming surfaces, covering over landfills, etc.
– *Landscape and biodiversity:* measures to protect biotopes and natural areas, e.g. wetlands, streams, stone walls, pastures and meadows. Preservation of landscape. Examples include purchasing land and burying electrical cables

Economising with natural resources

– Compressors for lower energy consumption, flue gas recycling ventilation, processed air recycling

2 Pollution prention investments

Pollution prevention investments affect the production process itself. They are often specific to the particular enterprise or industry but the following characteristics apply:
– they reduce emissions and discharges generated by the production process itself
– they make it possible to use production inputs that have less of an impact on the environment
– they involve completely new equipment and processes that have less of an impact on the environment.

These investments can be made for various reasons. If the main purpose of the investment is to reduce the environmental impact, you should report the whole amount invested. Often the equipment is fully integrated in the production process and/or cannot be identified as a distinct component. In this case, you should report the estimated share of the total investment that is due to the choice of more environmentally friendly technology (the “extra cost”).

Examples in different environmental domains

Air

– Closed production processes, re-circulation of process gases
– Measures involving combustion technology, control systems and optimisation of operations
– Measures involved in switching to less polluting raw materials and fuels, e.g. water-based products, substitutes for fossil fuels
– Replacement of coolants
– Encapsulation of equipment
– Control of chemical use, including use of precise amounts

Water

– Closed water systems, closed cooling systems, re-circulation of process water
– Measures involved in switching to less polluting production inputs
– Reduced discharges achieved e.g. by control equipment and programmes for reduced and more efficient water use and reduced losses of solid substances
– Maximisation of water circulation
– Countercurrent rinsing
– Multi-stage feeding of chemicals

Waste

– Increased recovery, use of recovered materials in production processes
– Reduced use of raw materials, utilisation of waste
– Switch to less polluting production inputs to make waste less hazardous

Other

– *Noise pollution:* low-noise machinery
– *Soil and groundwater:* measures involved in switching to less polluting production inputs

Economising with natural resources

– Heat exchanger, furnace plant for residue gas, recycling of processed energy

Statistiska centralbyrån
Statistics Sweden

A Environmental protection investments in 2001

We ask here about new investments in machinery, buildings and land made wholly or partly to reduce impacts on the environment, including peripheral costs for planning, installation connection fees. Investments for the purpose of expanding, altering, adapting and improving already existing equipment should also be included.

☐ **No environmental protection investmens in 2001** → **Please complete section B**

In the event of difficulty, estimate the amount involved, state the alternative that fits best and add written comments below.

A1 *Larger* environmental protection investments in 2001

Row no.	Amount invested in 2001 **SEK 1000s**	Type of investment (put X in **one** box only!) 1 Treatment	2 Prevention	**Main** environmental domain targeted by investment (put X in **one** box) Air	Water	Waste	Other
101		☐	☐	☐	☐	☐	☐
102		☐	☐	☐	☐	☐	☐
103		☐	☐	☐	☐	☐	☐
104		☐	☐	☐	☐	☐	☐
105		☐	☐	☐	☐	☐	☐
106		☐	☐	☐	☐	☐	☐
107		☐	☐	☐	☐	☐	☐
108		☐	☐	☐	☐	☐	☐
109		☐	☐	☐	☐	☐	☐
110		☐	☐	☐	☐	☐	☐

List the *largest* investments, one investment per row. If the main purpose of the investment was to reduce the impact on the environment, state the total amount invested during the year; in other cases, give the estimated extra cost of choosing more environmentally friendly technology. Mark the type of investment and main environmental domain involved with an X *(**one** box only!)* . Please add below a brief description of the investments (important!). At lack of space, continue on separate sheet.

1 2

Definitions and examples are given on page 2.

A2 *Minor* environmental protection investments (in excess of the above described) in 2001

Row no.	Type of investment	SEK 1000s Amount invested in 2001	***Of which*** in the environmental domains below Air	Water	Waste	Other
111	**Treatment** 1					
112	**Prevention** 2					

Smaller investments can be added up and entered on one line for each type of investment in a separate table. Please add a brief description of the investments.

1 2

Definitions and examples are given on page 2.

Give a brief description of the investments specified in the table.
Give the rowno., designation, purpose, basis for data on cost, etc. At lack of space, continue on a separate sheet.

B Economising with natural resources 2001 (voluntary information)

Definitions and examples are given on page 2.

Row no.	SEK 1000s Amount invested in 2001	***Of which*** energy-saving	heat-recovery
113			

☐ **No investments in 2001** → **Please complete section C**

Give a brief description

Statistiska centralbyrån
Statistics Sweden

C Current expenditure for environmental protection in 2001

Here you should report all costs for environmental protection that are not investments. These may be related to existing equipment but they can also be more general. Examples include payments for transport of waste and landfill, operation of purification plants, environmental management and certification, costs for personnel with environmental responsibilities, etc.

For each type of expenditure you should state separately the costs for work by your own enterprise (row 30) and payments for purchased services (row 31). Please note that personnel costs (row 30) should be reported separately.
Payments to municipal water purification and wastewater treatment plants, interest payments and capital costs (depreciation), and payments of general environmental taxes should not be reported.

☐ **No current expenditure for environmental protection in 2001** → **Pleaste complete section D**

In the event of difficulty, estimate the amount involved, state the alternative that fits best and add written comments below.

Current expenditure environmental protection 2001

		SEK 1000s							
		1 Operations, maintenance, inspection and control	*Of which* in the environmental domains below				2 General environmental administration, education and training,information, etc.	3 Research and development	4 External waste treatment fees	5 Other
			Air	Water	Waste	Other				
		1	2				3	4	5	6
Total *internal* expenditures (for example staff, material, energy consumption etc. that are being used for environmental labour within the enterprise)	30									
Therof staff expenditures . . . 6 SEK 1000s										
Total *bought* services and fees (for example payments for transportations and deposits for waste disposals, payments for environmental consultants and supervising fees)	31									

→ *continue* →

Give a brief description of the investments specified in the table above.
Give the row, designation, purpose, basis for data on cost, etc.

1 Operations, maintenance
Costs for personnel, materials, energy used in operations and maintenance of existing plant and general environmental supervision. Inspection fees paid to public authorities (row 31) should be given under purchased services.

2 General environmetntal administration
State here costs for general information, investigation, education and training of own personnel, environmental management and certification, etc. This includes costs for environmental departments, environmental coordinators, etc., that are not specifically related to operations and maintenance or research. Purchased services here can refer to environmental education and training, environmental certification or environmental studies conducted by external agents.

3 Research
Total costs for R&D, tests, etc., aimed at reducing the impact of the enterprises operations on the enviornment. Purchased services here can refer to financing of activities at other enterprises in the group.

4 Fees for waste treatment
Purchased services only. This includes payments for transport and landfill of all types of waste, payments for treatment outside the enterprise and hire of skips and drainage receptacles. **N.B. Waste tax shall not be included!**

5 Other
Report here all other current costs for environmental protection, including estimated extra cost of purchasing less polluting, more expensive production inputs and fuels. **Soil decontamination inckluded!**

6 Staff expenditure for Environmental protection
The costs for the enterprises own work on environmental protection reported above include personnel costs. This question asks for a separate statement of these personnel costs, incl. social insurance payments and other peripheral costs.

D Follow-up and evaluation

How long did it take to fill in this form (incl. data collection)?	hours

☐ We would like a electronic summary of the statistics
"Environmental protection expenditure for enterprises 2001"