STATISTICS
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Pilot Survey of Environmental Protection Investments and Current Expenditure in the Manufacturing Industry

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Abstract

A new questionnaire was developed by Statistics Denmark based on the experiences made from the project 'Survey of the possibilities of collecting questionnaire-based data on environmental protection expenditure for the manufacturing industry', which was carried out by Mr. Laban Karlshøj in May 2002. The questionnaire was also evaluated by the Methodology Unit at Statstistics Denmark and the Norwegian and Swedish statistics offices recommendations were taken into account. The questionnaire was prepared with great emphasis on the importance of a user-friendly layout and easy to read and understand instructions.

400 firms chosen by size and industrygroups received a questionnaire. Information about total expenditure and investments from the firms was preprinted on the questionnaire to make it easier to estimate the given information about environmental expenditures.

The survey has shown that it is technically possible to use the method chosen, but there is still a long to go before the survey results can be assumed to be representative. The sample was not sufficiently large to capture data from all industries and from all enterprise size groups, but the survey has created a better basis for conducting better stratified samples in the future.

The survey has shown that it is still difficult for the enterprises to fill in the questionnaire, although it has been prepared in such a way that it should be easy to read and understand. The reason for this is that the information requested is not always readily available from the information systems of the enterprises. Further more the pilot project has not created a reliable basis for assessing the enterprises' possibilities of indicating the various environmental domains on a sufficient basis. However, it is our assumption that when the survey is made compulsory, the number of questionnaires will increase, and when Statistics Denmark has been provided with the necessary resources to assist the enterprises, this problem will presumably be considerably reudced.

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1 Introduction

1.1 Purpose

Future compliance of new terms for compulsory statistics

The task was to *make preparations for* complying with EU's new terms in the Structural Business Statistics Regulation (SBS Regulation[1]) for compiling compulsory statistics divided by:

- End-of-pipe investments (variable 2 11 0)
- Integrated investments (variable 21 12 0)
- Total current expenditure on environmental protection (variable 21 14 0)

Statistics on investments for pollution treatment and for pollution prevention are to be annually compiled, while statistics on current expenditure related to environmental protection are to be compiled every three years. It should be noted that business enterprises have been legally obliged to report data on their investments for pollution treatment since 1999. Statistics Denmark has made efforts to collect these data, but the quality of the data has been very low.

Our aim is to conduct cross-tabulations for all three expenditure categories for the Nace groups NACE 15 – 37 plus 40 - 41, and the 4 environmental domains of the manufacturing industry: Protection of ambient air and climate, Wastewater management, Waste management and Other environmental protection activities. It must, ideally, be possible to sub-divide all statistical data according to enterprise size (1–49; 50-249; 250 – 499; 500-999 and 1000+).

Main task of the project: Use of supporting information

The main task of the project was to evalutate whether it was possible for Statistics Denmark to integrate the existing information in the present accounts statistics for the manufacturing industry with the new compulsory environmental variables at SBS. This integration of data was recommended on the basis of experience from a similar project conducted in Norway, where data had not been integrated.

What sample size is needed?

Furthermore, the pilot project was conducted to provide information on how to collect the necessary environmentally related economic data, while at the same time keeping the response burden of the business enterprises as low as possible, including considerations as to whether data can be reported electronically via the Internet. However, attention was only, to a small degree, focused on this part of the project, as simultaneously with conducting this pilot project at Statistics Denmark, general fact-finding work establishing that all data reported to Statistics Denmark could be submitted via the Internet at the business portal known as "Virk.dk", which had been developed in the general government sector.

Increasing demand for this type of data

There is an increasing demand for this type of data. The data are typically requested by the general public and by the central and local governments, but also by the manufacturing industry and its organisations. The demand is due

[1] Council Regulation No 58/97 on Structural Business Statistics

to, e.g. the need for being able to assess the impact on (new) political initiatives in the environmental domain.

1.2 Procedure

Based on previous experience

The project prepared a comparatively simple questionnaire, which was primarily based on the experienced gained from the survey conducted by Mr. Laban Karlhøj at Statistics Denmark in May 2002: "Survey of the possibilities of collecting questionnaire-based data on environmental protection expenditure for the manufacturing industry". Furthermore, particularly Swedish and Norwegian experience from similar projects was concretely applied in the Danish survey. See, Hass and Smith: "Methodology Work for Environmental Protection, Investment and Current Expenditure in Manufacturing Industry" (2002) and Eurostat: "Environmental Expenditure Statistics, Industry Data Collection Guidebook" (2001).

396 questionnaires were mailed

396 questionnaires were mailed to relevant business enterprises (stratified selection). This selection was undertaken in close collaboration with Statistics Denmark's Methodology Unit. The experience gained from the survey has been used for evaluating what sample size is needed in order to compile, on a full scale, qualitative statistics of an acceptable quality, while at the same time keeping the response burden of the enterprises as low as possible.

The present survey contains results in the form of tabular data as well as all the methodological considerations made in connection with designing the questionnaire, and a description of the methods used for estimating and grossing up data.

It must be emphasized that the margins of errors of this statistical survey are so wide that Statistics Denmark do not want to consider the results presented as official statistics. The results presented are only the best possible estimates made, by the authors, on the basis of the available data material. The purpose of the survey was primarily not to produce statistical results, but to make a concrete assessment of the possibility of finding a future method for collecting the necessary environmental-economic data, which would enable Denmark to comply with the statistical obligations of the EU.

2 Questionniare design

2.1 Principles

The experience

The form and content of the questionnaire were to be based on the experience already gained, respectively the other Nordic countries, the EU, and from the Danish experience previously gained. It was also important that Statistics Denmark's own expertise was utilized, and against this background Statistics Denmark's Methodology Unit was also involved in the process.

Information is not readily available from the enterprises

One of the great challenges of the survey was to design a simple and clear questionnaire. This was a particularly great challenge in the survey due to:

- Information is not typically available from the accounts of the enterprises.
- Enterprises have not previously been asked to report this type of data.
- Estimation of the environmental share of current expenditure or of investments may be a difficult process.

It was therefore obvious to prepare thorough instructions and a comprehensive questionnaire to ensure that the correct figures are reported by the respondents. However, Statistics Denmark decided to use a simple questionnaire as well as brief and easy-to-understand instructions. How the questionnaire was concretely developed is described below.

2.2 Process

Focus on simplicity and availability

One of the central recommendations from the other Nordic countries was to keep the definitions, instructions and the questionnaire layout as simple and easily available as possible. It was also recommended to place definitions, instructions and examples as closely as possible to the space in which the data were to be entered.

Basis of the questionnaire close to the Norwegian qeustionnaire

Against this background, a questionnaire was prepared, which was very close to the Norwegian and Swedish questionnaires – however with a slightly more simple layout and structure. The most recent versions of the questionnaires in the Nordic countries are centred on a number of questions, but are greatly supplemented with instructions and examples. However, examples in the Swedish questionnaire are given on a separate page – facing the space in which the figures are to be entered.

But with a more simple structure

In order to construct a questionnaire for the enterprises which is easy to complete with data, we decided that one subject was to be based on each page:

- current expenditure for environmental protection,
- investments in equipment for pollution treatment and
- investments in equipment for pollution prevention.

On the front page, it was possible to indicate any comments to the questionnaire and to give any information on contact persons of the enterprises. Thereby, the questionnaire took up a total of 4 pages.

Pre-printed information to reduce the risk of erroneous data reports

One problem of the Norwegian survey was that there was some doubt concerning which enterprise unit, information in the survey was requested. Was it expenditure at corporate group level or was it only environmental costs incurred at the workplace unit in question? To avoid any misunderstanding in the Danish survey, information was preprinted about total current expenditure and total investments of the enterprises in the year under survey (2001). These data were extracted from Statistics Denmark's Accounts Register. The method was intended to reduce the risk of erroneous data reports, similar to those of the Norwegian survey, as environmental costs would always make up a (minor) percentage of respectively, total investments and current expenditure.

First draft questionnaire was presented to the Methodology Unit

Statistics Denmark's Methodology Unit has had a decisive influence on the design of the Danish questionnaire. Most important of all was that the questionnaire had to be clear, which would imply that the respondents could easily obtain an overview of which information was required, and where the information was to be entered. The first draft questionnaire was presented to the Methodology Unit. Their recommendation on the first draft questionnaire was to fill in data in only one page instead of three pages as in the draft. It was difficult to combine this requirement with the other recommendations, which aimed at placing instructions and examples where the figures were to be entered.

Adjusted questionnaire was sent to Norway and Sweden

However, we did make efforts to implement the recommendations from the Methodology Unit, and a questionnaire was designed, which generally speaking became the final questionnaire (for a more detailed description, see the paragraph below). This questionnaire was sent to colleagues in Norway and Sweden. The criticism put forward was, not surprisingly, aimed at the instructions/examples, which were to be placed closer to where the figures were to be filled in. The overall comments formed the basis for our preparations of the final questionnaire.

2.3 Final questionnaire

The questionnaire

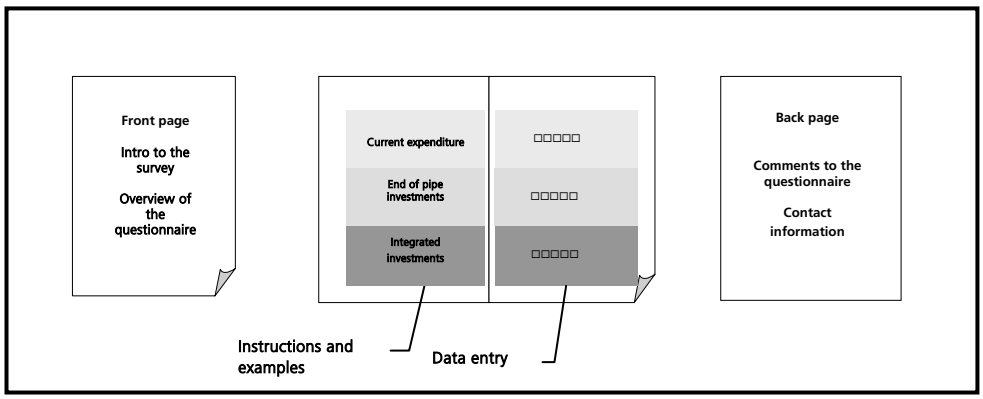
The final questionnaire was made up of four pages. The first page presents briefly the survey and which information we want the respondents to report to Statistics Denmark.

The respondents are only asked to fill in one single page

There is, subsequently, a double page consisting of a left side with short and simple instructions for the respondents, supplemented by some examples of the expenditure on environmental protection. On the right side of the double page, the respondents are to fill in figures in the questionnaire.

Visual relationship results in a more clear questionnaire

To make compensations for the circumstance that instructions and examples are not placed where the figures are to be entered in the questionnaire, a visual relationship was created between page two and page three, by the use of three different colours across the two pages. Any comments to the questionnaires can be stated overleaf - it is also here that the contact person of the enterprise writes his/her name. See the questionnaire at the back of the report..



Quality check

Apart from an inclusion of total current expenditure and total investments to ensure "the correct" business unit, there was also space in the questionnaire for the respondent to fill in a short description of the integrated investments. The purpose of providing this possibility to elaborate a reply is to ensure that the respondents have understood correctly the task.

2.4 Reactions of the respondents

Reactions

The reactions of the respondents have generally been positive, and there are hardly any respondents whose reactions to the questionnaire or the survey were negative. However, the response rate is very low, one possible explanation of this is that the task involved in extracting information on environmental investments is very difficult – especially, when the respondent provide information for the first time.

Some examples

A representative extract of the comments made by the business enterprises in the questionnaire concerning the survey is listed below:

- "It is difficult to understand the examples on what should or what should not be included."
- "It is impossible to supply data on environmental expenditure at such a detailed."
- "It is impossible to allocate the necessary administrative resources"
- "We are a small business enterprise, and the questionnaire is, therefore, not of relevance to us, as the amount of waste, etc. is more or less similar to that of a normal family household."
- "It is a difficult exercise to conduct retrospectively, as costs are not separated into, e.g. filters for process purposes and filters for environmental protection. I propose that business enterprises receive a list of all the data on costs/investments that are to be reported in the future, so that this can be integrated into our accounting systems."
- "We have not had any expenditure of this type."

2.5 Evaluation of the questionnaire

Satisfied with the questionnaire

The business enterprises in the manufacturing industry were generally satisfied with the questionnaire prepared by Statistics Denmark. However, for some enterprises it was difficult to understand which information was

requested by Statistics Denmark. For example, some enterprises have not reported data on waste and waste water expenditure, and as it must be assumed that most industrial enterprises have expenditure related to this field, it seems to indicate that the task has not been correctly understood. However, another explanation of this phenomenon is perhaps that it is difficult to find the relevant information, as the information is for the time being not integrated into the reporting of accounting figures by the enterprises. Experience has, however, shown that the quality increases when the enterprises have become used to this type of survey. Similarly, it must be expected that during the first couple of years a close follow-up must be conducted by Statistics Denmark (e.g. by way of subsequent telephone interviews).

Questionnaires for supply enterprises must contain two additional spaces

However, the questionnaires for the supply enterprises (NACE 40-41) proved to be defective in relation to the data available to Statistics Denmark. Against this background, it will in the future be necessary to extend these questionnaires by the inclusion of two additional spaces in which the enterprises are asked to fill in data on total investments and total current expenditure.

Minor improvements in the future questionnaires

Some respondents overlooked the fact that the amount must be stated in "thousands", and another problem is that some enterprises do not enter data in the spaces, although it is written above that if there is no expenditure, a zero-amount must be stated. This must appear more clearly from the future questionnaires.

3 Statistical methods

3.1 Selection of sample and grossing up

Sample

Two table extracts were made by Statistics Denmark's Division for Accounts Statistics, which contained central accounts data relating to the manufacturing enterprises included in the pilot survey. Extract 1 contained all the workplaces, where the legal unit was engaged in activities within one of the above-mentioned industries, and which was the main industry. Extract 2 contained workplaces within the industries 40.10.00, 40.20.00, 40.30.00, 41.00.00, and where the enterprise was not engaged in activities within one of the selected industries, and which was the main industry.

The sample itself is divided into 28 strata, which comply with the following pattern.
Industries (7) * Size of turnover (4) = 28

The following industries (NACE) were included in the selection:

- 15+16
- 17-19
- 20-22
- 23-25
- 26
- 27-35
- 36-37

Size of turnover (DKK mio.):
- 0 – 25
- 25 – 100
- 100 – 500
- 500 -

A simple random selection was made within each stratum.

Grossing up

The process of grossing up implies briefly speaking that each enterprise group (stratum) has a grossing-up factor. This grossing-up factor is calculated in the following way:

Weight in strata j is given by: $w_j = N_j/n_j$
N_j = the total number of enterprises in strata i
n_j = number of replies in strata i

Or put in other words, if there are 30 units within a stratum and 8 questionnaires have been returned, the grossing-up factor for this stratum is 30/8, which is 3.75. The quantitative replies in this stratum are then multiplied by 3.75, and thereby the replies are made representative of the entire stratum.

The deviation from the grossed-up total current expenditure and investment data for the stated values in the official statistics was conducted by means of a proportional grossing up of current expenditure as well as investment expenditure. This was undertaken on the assumption that there was a normal distribution of expenditure values within each stratum.

3.2 Practical grossing up of data

Defective statistical material

As the existing statistical data material was highly defective, it was necessary to complete the missing information by means of a number of statistical analogy conclusions. The natural basis for grossing up was the collected data material from the questionnaires, but this was far from adequate.

Scaling of environmental expenditure

The method used was to gradually fill up with data from the bottom and upwards. First, a simple grossing up was conducted of the collected data, which is described in paragraph 3.1. On the basis of this, total current expenditure and total investment expenditure in the industries were estimated for each enterprise size group. Wherever this estimation did not comply with the data available to Statistics Denmark's Division for Accounts Statistics, the grossed-up data material has been "scaled" in such a manner that the totals for current expenditure and investment data in the industries were brought into line with each other. The scaling of environmental current expenditure was conducted in relation to total current expenditure, while scaling of both end-of-pipe and integrated environmental investments were set in relation to total investments.

The gaps are filled out

In cases where there was no available information for the industry that could be used within the relevant enterprise size group, the relative information is obtained from one of the other size groups. If the result then obtained was not satisfactory, the information was collected from the "adjacent" industry on

the assumption that the environmental behaviour of this industry was the one which was the nearest.

It must be expected that this form of alternative data collection can be considerably reduced, when the survey is made compulsory, and there is a full-scale sample.

Industries for which data are considered defective

Industries for which data are available but which are considered to be defective for all enterprise size groups are as follows: Tobacco factories (NACE 16); Pulp and paper (NACE 21); Chemicals (NACE 24); Rubber and plastic (NACE 25); Manufacture of other electrical machinery and apparatus (NACE 31); Manufacture of telecommunications equipment (NACE 32); Manufacture of medical equipment, optical instruments, watches and clocks, etc. (NACE 33). The list of missing data would have been even greater, if the recommendations in the Structural Regulations of 5 enterprise size groups were to be followed. It must again be assumed that the lack of statistical data can be considerably improved by extending the sample survey – supplemented by making it compulsory to complete the questionnaire with data.

Industries without any original environmental data

Industries for which there is no original existing environmental information are as follows: Manufacture of wood and wood products (NACE 20); Manufacture of refined petroleum products, etc. (NACE 23); Manufacture of basic metals (NACE 27); Manufacture of office machinery and computers (NACE 30); Manufacture of motor vehicles, etc. (NACE 34); Manufacture of other transport equipment (NACE 35); Recyclying of waste products (NACE 37). This constitutes a significant lack in conducting the survey, which cannot be expected to be eliminated until the survey is made compulsory.

3.3 Important reservations in the analysis

Distribution of the material into 2 groups

Unfortunately, it has proved to be necessary to divide the analyses into two groupings:

- The first group comprises the industries in the NACE groups 15 -37, which below are called ”Manufacturing enterprises”
- The second group comprises the industries in the NACE groups 40 – 41, which below are called ”Supply enterprises”

There are no accounts data for the supply enterprises

The reason for this distribution is due to the circumstance that enterprise-related accounts data for the “manufacturing enterprises” are available to Statistics Denmark, whereas accounts data for the “supply enterprises” are only available to Statistics Denmark in a highly summary form. This gives rise to two grossing-up methods that differ widely.

Focus is primarily on the manufacturing enterprises

A majority of the analyses focuses primarily on the “manufacturing enterprises”, which despite the wide number of inadequate data, are nevertheless the group which is best monitored by the pilot survey, and which can form the basis for comparatively reliable recommendations for the future production of statistics on a full scale. This is only partially the case with respect to the “Supply enterprises”. Against this background, some of the recommendations concerning this part of the statistics will aim at the requirement of being able to collect more basic primary statistical data for this group.

4 Some main results

4.1 Response rates

Replies from 1 pct. of all manufacturing enterprises

In 2001, there were 19,863 manufacturing enterprises and 2,069 supply enterprises in Denmark, and on the basis of the stratified sample selection respectively, 312 and 84 enterprises were drawn and a questionnaire was mailed to these enterprises. Despite the fact that a letter was attached to the questionnaire and two written "reminders" were sent to the enterprises, we only succeded in receiving, respectively, 73 and 23 questionnaires that could be partially used – and especially the questionnaires from the supply enterprises are considered to be of a doubtful character. It can be seen from table 1 that despite the great number of reminders sent to the enterprises, we only succeded in receiving questionnaires from about 1 pct. of all enterprises. Several enterprises indicated that if participation in the survey was compulsory, they would (if required) have built up the necessary flows of information in the enterprises. Several enterprises also said that they did not have – or could not be expected to have sufficient administrative capacity to complete the questionnaires in the future.

Table 1 **Response rates in relation to the enterprise units**

NACE code		Number of units	Mailed	Usable	Mailed in relation to units	Mailed in pct.	Usable in pct.
		units			pct.		
15	Food and beverages	1 854	67	17	4	1	25
16	Tobacco factories	7	3	1	43	14	33
17	Textile industry	570	17	5	3	1	29
18	Wearing apparel industry	527	11	3	2	1	27
19	Leather industry	85	6	2	7	2	33
20	Wood and wood products	763	10	0	1	0	0
21	Pulp and paper	200	4	1	2	1	25
22	Publishing, printing	2 860	21	6	1	0	29
23	Manufacture of refined petroleum products	8	2	0	25	0	0
24	Manufacture of chemicals	372	19	6	5	2	32
25	Manufacture of rubber and plastic	736	14	1	2	0	7
26	Manufacture of non-metallic mineral produc.	734	33	10	4	1	30
27	Manufacture of basic metals	198	2	0	1	0	0
28	Manufacture of fabricated metal products	3 953	18	2	0	0	11
29	Manufacture of machinery and equipment	2 379	27	12	1	1	44
30	Manufacture of office machinery and computers	104	0	0	0	0	-
31	Manufacture of other electrical machinery and apparatus	948	7	2	1	0	29
32	Mfr. of telecommunications equipment	213	6	1	3	0	17
33	Manufacture of medical equipment, optical instruments, watches and clocks	700	6	1	1	0	17
34	Manufacture of motor vehicles	173	1	0	1	0	0
35	Manufacture of other transport equipment	410	3	0	1	0	0
36	Furniture industry and other manufacturing industries	2 042	33	3	2	0	9
37	Recycling of waste products	27	2	0	7	0	0
	Total "Industry"	**19 863**	**312**	**73**	**2**	**0**	**23**
40	Electricity, gas, steam and hot water supply	2 042	71	17	3	1	24
41	Water supply	27	13	6	48	22	46
	Total "Supply enterprises"	**2 069**	**84**	**23**	**4**	**1**	**27**

Pilot survey covered 30 pct. of the persons employed

Taking into accounts that there are differences in the number of employees in the enterprises, the picture thus obtained is not so miserable. Table 2 shows the questionnaires in relation to the size of enterprises. More than 110,000 of the 440,000 persons employed in the "industry" were originally covered by a questionnaire, which implies that almost 30 pct. of all persons employed would have been covered by the survey, if the survey had been compulsory. This must be considered to be a satisfactory sample selection, apart from certain industries (Wood and wood products, Manufacture of basic metals, Manufacture of office equipment and computers, Manufacture of other electrical machinery and apparatus, and Manufacture of other transport equipment). As participation in the survey was voluntary, a satisfactory response rate was, unfortunately, not achieved for a majority of the industries. The total response rate only reached 8 pct. This is not a satisfactory outcome in order to achieve a valid statistical result.

Table 2 **Response rates in relation to the number of persons employed**

Nace-kode		Units according to the Accounts Statistics	Mailed	Usable	Mailed in pct. (mailed/total from register in DST)	Response rate (usable/total acc. Acco. Sta.)
15	Food and beverages	71 275	44 619	7 009	63	10
16	Tobacco factories	1 317	1 032	276	78	21
17	Textile industry	7 182	1 428	599	20	8
18	Wearing apparel industry	3 311	835	78	25	2
19	Leather industry	1 363	958	767	70	56
20	Wood and wood products	13 727	971	-	7	0
21	Pulp and paper	8 033	1 058	324	13	4
22	Publishing, printing	31 181	3 242	1 197	10	4
23	Manufacture of refined petroleum products	597	522	-	88	0
24	Manufacture of chemicals	25 179	15 977	11 413	63	45
25	Manufacture of rubber and plastic	21 445	5 716	2 284	27	11
26	Manufacture of non-metallic mineral produc.	15 542	8 777	1 464	56	9
27	Manufacture of basic metals	8 630	537	-	6	0
28	Manufacture of fabricated metal products	40 367	1 592	39	4	0
29	Manufacture of machinery and equipment	67 170	6 644	3 672	10	5
30	Manufacture of office machinery and computers	1 450			0	0
31	Manufacture of other electrical machinery and apparatus	21 286	1 723	464	8	2
32	Mfr. of telecommunications equipment	10 796	2 388	90	22	1
33	Manufacture of medical equipment, optical instruments, watches and clocks	14 637	2 970	747	20	5
34	Manufacture of motor vehicles	6 701	761	-	11	0
35	Manufacture of other transport equipment	8 296	585	-	7	0
36	Furniture industry and other manufacturing industries	27 222	9 402	201	35	1
37	Recycling of waste products	389	136	-	35	0
	Total "Manufacturing industry"	**407 097**	**111 874**	**30 623**	**27**	**8**
40	Electricity, gas, steam and hot water supply	12 125	4 092	415	34	3
41	Water supply	1 810	271	25	15	1
	Total "Supply enterprises"	**13 935**	**4 363**	**440**	**31**	**3**

It can be established that the same explanation applies more or less to the "Supply enterprises". Here, the response rate in relation to the persons employed was as low as 3 pct.

4.2 Expenditure of the manufacturing industry for environmental purposes

Results are not representative of the Danish manufacturing industry

As already described, the results are widely influenced by the relatively low response rate of the data reported to Statistics Denmark. ***Consequently, the following results cannot be regarded as being representative of the Danish manufacturing industry 2001.*** On the other hand, the survey shows that despite defective data reports, statistics that are generally acceptable can be compiled, provided that we are ready to accept the preconditions inherent in the grossing-up procedures. The need for these assumptions will definitely be considerably reduced, when the data reporting to the statistics is made compulsory and the sample survey is doubled – especially with a view to improving the monitoring of the industries, where the quality of data is poor (Wood and wood products, Manufacture of basic metals, Manufacture of office equipment and computers, Manufacture of other electrical machinery and apparatus, and Manufacture of other transport equipment and the Supply enterprises).

0.7 pc.t of all current expenditure related to the environment

The total grossed-up figures for the Danish manufacturing industry shows that 0.7 pct. of all current expenditure can be related to the environment in the form they are defined by the Structural Regulation. However, there are clear indications that the amount is much greater in reality, as many enterprises have not provided data on, e.g. waste and waste water expenditure. When the questionnaire is made compulsory, Statistics Denmark will have better opportunities to go into detail with the replies returned by the enterprises – possibly, followed up by a telephone interview.

4 pct. of all investments related to the environment

It also appears from table 3 that 4 pct. of all investments in the manufacturing industry can be related to environmental purposes. This constitutes a figure which is far higher than that shown in previous Danish surveys, but the result is nevertheless still subject to wide margins of errors. This is something which is expected to be considerably minimised, when the survey is made compulsory. The environmental investments are distributed by 2.5 pct. for "End-of-pipe" investments and by 1.6 pct. for integrated environmental investments. It seems obvious that the Danish enterprises have had some considerable problems in understanding this question as well as in finding the relevant information in the enterprises, as this information is not readily available from the accounting systems of the enterprises. It must be assumed that this will be significantly improved, when the task is made compulsory, and the employees of Statistics Denmark can participate as an "environmental consultant" in connection with completing the questionnaires.

International comparison

In 2002, total investments attributable to environmental purposes reached 5 pct. in Sweden, while the corresponding level in Denmark was 4 pct. There was in Sweden and in Denmark a minor predominance in investments for environmental protection measures (End-of-pipe) in relation to investments in preventive environmental measures. In Norway, investments in "End-of-pipe"-technologies made up 3.5 pct. of total investments in the manufacturing industry in 2001, whereas Statistics Denmark reached 2.5 pct. for Denmark on the basis of the survey conducted.

Table 3 **Environmental expenditure in the manufacturing industry in 2001**

NACE code		Total current expenditure (1)	Current expenditure on the environment (2)	Environmental current expenditure in pct. of total (1) / (2)	Of which services	Total investments (3)	End-of-pipe investments (4)	Integrated environmental investments (5)	Total environmental investments (4+5)	Environmental investments in pct. of total (4+5) / (3)
		DKK mio.		pct.	DKK mio.					pct.
	Total manufacturing industry	**515 764**	**3 567**	**0,7**	**2 006**	**35 311**	**873**	**548**	**1 421**	**4,0**
15	Food and beverages	134 917	920	0,7	447	7 669	290	123	413	5,4
16	Tobacco factories	2 685	1	0,0	0	134	0	0	0	0,1
17	Textile industry	7 715	77	1,0	70	639	0	1	1	0,2
18	Wearing apparel industry	4 907	1	0,0	1	123	0	0	0	0,0
19	Leather industry	3 312	1	0,0	1	101	2	2	4	4,3
20	Wood and wood products	12 571	508	4,0	323	919	109	68	177	19,2
21	Pulp and paper	9 804	396	4,0	252	582	69	32	101	17,4
22	Publishing, printing	31 851	23	0,1	19	2 312	0	46	46	2,0
23	Manufacture of refined petroleum products	7 050	101	1,4	36	183	5	0	5	3,0
24	Manufacture of chemicals	45 242	650	1,4	231	4 275	127	1	128	3,0
25	Manufacture of rubber and plastic	20 115	129	0,6	12	2 057	0	4	4	0,2
26	Manufacture of non-metallic mineral produc.	15 584	502	3,2	464	1 933	61	6	68	3,5
27	Manufacture of basic metals	9 880	17	0,2	17	591	31	48	79	13,3
28	Manufacture of fabricated metal products	34 178	58	0,2	58	2 479	130	171	301	12,1
29	Manufacture of machinery and equipment	67 602	78	0,1	46	3 472	26	35	62	1,8
30	Manufacture of office machinery and computers	1 975	5	0,2	1	44	0	0	0	0,0
31	Manufacture of other electrical machinery and apparatus	30 687	71	0,2	8	2 227	0	0	0	0,0
32	Mfr. of telecommunications equipment	13 386	0	0,0	0	1 058	21	0	21	2,0
33	Manufacture of medical equipment, optical instruments, watches and clocks	15 795	15	0,1	11	1 637	0	3	3	0,2
34	Manufacture of motor vehicles	8 000	2	0,0	1	485	0	2	2	0,3
35	Manufacture of other transport equipment	9 970	2	0,0	1	494	0	2	2	0,3
36	Furniture industry and other manufacturing industries	27 286	10	0,0	7	1 688	0	5	5	0,3
37	Recycling of waste products	1 250	0	0,0	0	209	0	0	0	0,0

Impossible to compile statistics for the largest enterprise groups

Against the background of the very small pilot survey conducted by Statistics Denmark, it is impossible to compile reliable statistics for the two largest enterprise groups (500+ and 1,000+). For many of the industries in Denmark, it is impossible to undertake this distribution, if the statistical confidentiality practice has to be observed.

The statistics are so to speak built up from bottom and upwards. First, complete statistics are compiled for enterprises employing 0 – 50 employees, then for enterprises with 50 – 250 employees, and statistics for enterprises with over 250 employees are then ultimately produced. This has been carried out by filling out the "gaps", which were unfortunately caused by the original statistical data material.

4.3 Manufacturing enterprises employing under 50 persons

Data material extremely defective

Table 4 is exclusively based on data collected from the questionnaires. The data material is extremely defective. There are no usable data for manufacturing enterprises with under 50 employees. Information is missing for: Tobacco factories, Wood and wood products, Pulp and paper, Manufacture of refined petroleum products, Manufacture of chemicals Manufacture of rubber and plastic, Manufacture of basic metals, Manufacture of office machinery and computers, Manufacture of other electrical machinery and apparatus, Manufacture of telecommunications equipment, Manufacture of medical equipment, optical instruments, watches and clocks, Manufacture of motor vehicles, Manufacture of other transport equipment and Recyclying of waste products. When the statistics are to be planned for compilation on a full scale, it is important to assess whether this lack of reliable data can be covered by making the survey compulsory, or whether it is necessary to expand the sample selection within particularly these industries. It is a major problem, as a majority of the Danish manufacturing enterprises falls within this size category. Manufacturing enterprises employing under 50 persons make up about 93 pct. of all enterprise units, while the number of employees only cover about 25 pct. of all persons employed.

Table 4 **First grossing up of environmental expenditure for the manufacturing industry (0-50 employees)**

NACE code		Current expenditure	Estimated current expen. on the enviro.	Estimated current costs on services	Estimated total investments	Estimated end-of-pipe investments	Estimated integrated investments
		DKK mio.					
15	Food and beverages	16 617	40	31	437	0	21
16	Tobacco factories	0	0	0	0	0	0
17	Textile industry	1 055	3	2	23	0	0
18	Wearing apparel industry	3 052	0	0	7	0	0
19	Leather industry	414	1	1	2	0	0
20	Wood and wood products	0	0	0	0	0	0
21	Pulp and paper	0	0	0	0	0	0
22	Publishing, printing	11 844	8	6	102	0	0
23	Manufacture of refined petroleum products	0	0	0	0	0	0
24	Manufacture of chemicals	0	0	0	0	0	0
25	Manufacture of rubber and plastic	0	0	0	0	0	0
26	Manufacture of non-metallic mineral produc.	2 348	299	280	456	2	0
27	Manufacture of basic metals	0	0	0	0	0	0
28	Manufacture of fabricated metal products	9 497	16	16	353	18	183
29	Manufacture of machinery and equipment	21 227	2	2	481	8	0
30	Manufacture of office machinery and computers	0	0	0	0	0	0
31	Manufacture of other electrical machinery and apparatus	0	0	0	0	0	0
32	Mfr. of telecommunications equipment	0	0	0	0	0	0
33	Manufacture of medical equipment, optical instruments, watches and clocks	0	0	0	0	0	0
34	Manufacture of motor vehicles	0	0	0	0	0	0
35	Manufacture of other transport equipment	0	0	0	0	0	0
36	Furniture industry and other manufacturing industries	3 840	3	2	3	0	0
37	Recycling of waste products	0	0	0	0	0	0

The sample survey is representative of total current expenditure, but not representative of investment expenditure

Apart from the fact that there were no original data for a number of industries, the grossing up of the original data (wherever available) did not precisely result in the "verification figures" which could be derived from the accounts registers maintained by Statistics Denmark. In table 4, e.g. Manufacture of food and beverages, total current expenditure is estimated at DKK 16,617 in mio., while total environmental expenditure is estimated at DKK 437 in mio. On the basis of Statistics Denmark's accounts registers, it can be seen that current expenditure can be estimated at DKK 16,643 in mio. and investment at DKK 1,121 in mio. This proves that the sample survey conducted by Statistics Denmark was comparatively reliable in providing a "true picture" of total current expenditure in the industry, whereas the sample only "captured" less than half of total investment expenditure. This constitutes a distortion of the data material in the sample survey, and further work will have to be carried out in this respect, when the statistics are made compulsory.

Scaling of environmental expenditure

In table 5, the problem is technically solved by scaling the environmental expenditure in relation to Statistics Denmark's register-based information concerning total current expenditure and environmental investments in relation to Statistics Denmark's total investment data. For Manufacture of food and beverages with under 50 persons employed, this implies, in practice, that the environmental expenditure in table 4 is proportionately adjusted by 0.2 pct. (16,643/16,617), and environmental investments are adjusted by as much as 156.5 pct. (1,121/437).

Table 5 **Second grossing up of environmental expenditure for the manufacturing industry (0-50 employees)**

NACE code		Total current expenditure	Env. current expenditure	Of which services	Total investments	EOPI	Integrated	Environ. investments
		DKK mio.						
15	Food and beverages	16 643	40	31	1 121	0	53	53
16	Tobacco factories	N/A	N/A	N/A	N/A	N/A	N/A	N/A
17	Textile industry	2 960	7	5	215	0	0	0
18	Wearing apparel industry	2 445	0	0	59	0	0	0
19	Leather industry	427	1	1	4	0	0	0
20	Wood and wood products	N/A	N/A	N/A	N/A	N/A	N/A	N/A
21	Pulp and paper	N/A	N/A	N/A	N/A	N/A	N/A	N/A
22	Publishing, printing	12 532	8	7	801	0	0	0
23	Manufacture of refined petroleum products	N/A	N/A	N/A	N/A	N/A	N/A	N/A
24	Manufacture of chemicals	N/A	N/A	N/A	N/A	N/A	N/A	N/A
25	Manufacture of rubber and plastic	N/A	N/A	N/A	N/A	N/A	N/A	N/A
26	Manufacture of non-metallic mineral produc.	3 844	490	459	456	2	0	2
27	Manufacture of basic metals	N/A	N/A	N/A	N/A	N/A	N/A	N/A
28	Manufacture of fabricated metal products	16 619	28	28	1 361	71	706	778
29	Manufacture of machinery and equipment	16 369	2	2	923	16	0	16
30	Manufacture of office machinery and computers	N/A	N/A	N/A	N/A	N/A	N/A	N/A
31	Manufacture of other electrical machinery and apparatus	N/A	N/A	N/A	N/A	N/A	N/A	N/A
32	Mfr. of telecommunications equipment	N/A	N/A	N/A	N/A	N/A	N/A	N/A
33	Manufacture of medical equipment, optical instruments, watches and clocks	N/A	N/A	N/A	N/A	N/A	N/A	N/A
34	Manufacture of motor vehicles	N/A	N/A	N/A	N/A	N/A	N/A	N/A
35	Manufacture of other transport equipment	N/A	N/A	N/A	N/A	N/A	N/A	N/A
36	Furniture industry and other manufacturing industries	9 872	8	5	368	0	0	0
37	Recycling of waste products	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Missing primary data created on the basis of adjacent groups

Where original data for an industry within the size group 0-50 employees were not available from the questionnaires, Statistics Denmark has made efforts to find the missing information within the same industry, but in the size group 50-250 employees. The relative distributions between total current expenditure in relation to environmental current expenditure and total investments in relation to environmental investments are here included. If usable figures could not be found in this way, the relative distributions of the "adjacent industry" were used.

When grossing up of the sample survey and completion of the missing primary data have been created, it is possible to produce table 6.

Environmental costs of small enterprises

The table shows that Danish manufacturing enterprises employing under 50 persons spend about 1 pct. of their total current expenditure on environmental purposes. It appears from the present report that the many gaps in the data material implies that results must be interpreted with caution. However, the practical procedure has proved to be usable. The problem is to select a sufficiently representative sample and to ensure that the questionnaire is understood and correctly filled in by the enterprises.

Table 6 **Final grossing up of environmental expenditure for the manufacturing industry (0-50 employees)**

NACE code		Total current expenditure (1)	Current expenditure on the environment (2)	Pct. of total current expenditure (1) / (2)	Of which services	Total investments (3)	End-of-pipe investments (4)	Integrated environmental investments (5)	Total environmental investments (4+5)	Pct. of total investments (4+5) / (3)
		DKK mio.		pct.	DKK mio.					pct.
	Total manufacturing industry	**113 995**	**966**	**0,8**	**741**	**7 853**	**157**	**229**	**386**	**4,9**
15	Food and beverages	16 643	40	0,2	31	1 121	0	53	53	4,7
16	Tobacco factories	25	0	0,0	0	2	0	0	0	0,3
17	Textile industry	2 960	7	0,2	5	215	0	0	0	0,0
18	Wearing apparel industry	2 445	0	0,0	0	59	0	0	0	0,0
19	Leather industry	427	1	0,2	1	4	0	0	0	0,0
20	Wood and wood products	4 533	183	4,0	117	258	31	19	50	19,2
21	Pulp and paper	2 141	87	4,0	55	148	18	7	24	16,5
22	Publishing, printing	12 532	8	0,1	7	801	0	0	0	0,0
23	Manufacture of refined petroleum products	227	3	1,4	1	27	1	0	1	3,0
24	Manufacture of chemicals	3 857	55	1,4	20	371	11	1	12	3,1
25	Manufacture of rubber and plastic	5 161	33	0,6	3	337	0	1	1	0,3
26	Manufacture of non-metallic mineral produc.	3 844	490	12,7	459	456	2	0	2	0,5
27	Manufacture of basic metals	1 552	3	0,2	3	85	4	7	11	13,3
28	Manufacture of fabricated metal products	16 619	28	0,2	28	1 361	71	140	211	15,5
29	Manufacture of machinery and equipment	16 369	2	0,0	2	923	16	0	16	1,7
30	Manufacture of office machinery and computers	767	2	0,2	0	18	0	0	0	0,0
31	Manufacture of other electrical machinery and apparatus	5 142	12	0,2	1	443	0	0	0	0,0
32	Mfr. of telecommunications equipment	1 573	0	0,0	0	145	3	0	3	2,0
33	Manufacture of medical equipment, optical instruments, watches and clocks	4 029	5	0,1	4	374	0	1	1	0,3
34	Manufacture of motor vehicles	1 347	0	0,0	0	134	0	0	0	0,3
35	Manufacture of other transport equipment	1 772	0	0,0	0	176	0	1	1	0,3
36	Furniture industry and other manufacturing industries	9 872	8	0,1	5	368	0	0	0	0,0
37	Recycling of waste products	158	0	0,0	0	27	0	0	0	0,0

4.4 Manufacturing enterprises employing 50-250 persons

Defective information from a number of industries

The problems for enterprises with 50-250 employees are more or less the same as those for small enterprises. Tables 7 and 8 show the number of industries for which information is missing, and which results the scaling provides for those industries where original questionnaire-based data are available. In addition to defective information from a number of industries, there are also "problems" with the questionnaire-based data from the industry Manufacture of machinery and equipment. They are obviously subject to errors. This is a factor implying that special efforts must be made when the survey is conducted on a full scale.

Table 7 **First grossing up of environmental expenditure for the manufacturing industry (50-250 employees)**

NACE code		Current expenditure	Estimated environmental costs	Current costs on services	Estimated total investments	Estimated end-of-pipe investments	Integrated investments
		DKK mio.					
15	Food and beverages	31 681	217	166	1 460	33	26
16	Tobacco factories	0	0	0	0	0	0
17	Textile industry	6 844	103	95	145	0	1
18	Wearing apparel industry	901	0	0	25	0	0
19	Leather industry	0	0	0	0	0	0
20	Wood and wood products	0	0	0	0	0	0
21	Pulp and paper	0	0	0	0	0	0
22	Publishing, printing	0	0	0	0	0	0
23	Manufacture of refined petroleum products	0	0	0	0	0	0
24	Manufacture of chemicals	0	0	0	0	0	0
25	Manufacture of rubber and plastic	0	0	0	0	0	0
26	Manufacture of non-metallic mineral produc.	2 655	1	1	48	3	0
27	Manufacture of basic metals	0	0	0	0	0	0
28	Manufacture of fabricated metal products	0	0	0	0	0	0
29	Manufacture of machinery and equipment	34 782	93	45	993	0	24
30	Manufacture of office machinery and computers	0	0	0	0	0	0
31	Manufacture of other electrical machinery and apparatus	21 948	51	6	1 402	0	0
32	Mfr. of telecommunications equipment	7 785	0	0	174	3	0
33	Manufacture of medical equipment, optical instruments, watches and clocks	0	0	0	0	0	0
34	Manufacture of motor vehicles	0	0	0	0	0	0
35	Manufacture of other transport equipment	0	0	0	0	0	0
36	Furniture industry and other manufacturing industries	10 017	0	0	326	0	1
37	Recycling of waste products	0	0	0	0	0	0

Table 8 **Second grossing up of environmental expenditure for the manufacturing industry (50-250 employees)**

NACE code		Total current expenditure	Env. current expenditure	Of which services	Total investments	EOPI	Integrated	Environmen. investments
		DKK mio.						
15	Food and beverages	22 106	152	116	1 509	34	27	61
16	Tobacco factories	N/A	N/A	N/A	N/A	N/A	N/A	N/A
17	Textile industry	3 759	57	52	175	0	1	1
18	Wearing apparel industry	1 615	1	0	43	0	0	0
19	Leather industry	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20	Wood and wood products	N/A	N/A	N/A	N/A	N/A	N/A	N/A
21	Pulp and paper	N/A	N/A	N/A	N/A	N/A	N/A	N/A
22	Publishing, printing	N/A	N/A	N/A	N/A	N/A	N/A	N/A
23	Manufacture of refined petroleum products	N/A	N/A	N/A	N/A	N/A	N/A	N/A
24	Manufacture of chemicals	N/A	N/A	N/A	N/A	N/A	N/A	N/A
25	Manufacture of rubber and plastic	N/A	N/A	N/A	N/A	N/A	N/A	N/A
26	Manufacture of non-metallic mineral produc.	4 978	2	1	828	45	0	45
27	Manufacture of basic metals	N/A	N/A	N/A	N/A	N/A	N/A	N/A
28	Manufacture of fabricated metal products	N/A	N/A	N/A	N/A	N/A	N/A	N/A
29	Manufacture of machinery and equipment	19 404	52	25	855	0	21	21
30	Manufacture of office machinery and computers	N/A	N/A	N/A	N/A	N/A	N/A	N/A
31	Manufacture of other electrical machinery and apparatus	5 377	12	1	219	0	0	0
32	Mfr. of telecommunications equipment	2 757	0	0	366	7	0	7
33	Manufacture of medical equipment, optical instruments, watches and clocks	N/A	N/A	N/A	N/A	N/A	N/A	N/A
34	Manufacture of motor vehicles	N/A	N/A	N/A	N/A	N/A	N/A	N/A
35	Manufacture of other transport equipment	N/A	N/A	N/A	N/A	N/A	N/A	N/A
36	Furniture industry and other manufacturing industries	7 984	0	0	429	0	1	1
37	Recycling of waste products	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Environmental expenditure is apparently lower in medium-sized enterprises

Table 9 shows the main results for the manufacturing industries employing between 50 – 250 persons. The results show that 0.8 pct. of all current expenditure is linked to environmental purposes, while 3.6 pct. of all investments are linked to environmental purposes. The circumstance that environmental expenditure is apparently lower than for the enterprises with under 50 employees is probably attributed to the problems with data in the industry: Manufacture of machinery and equipment. The results must be interpreted with great caution.

Table 9 **Final grossing up of environmental expenditure for the manufacturing industry (50-250 employees)**

NACE code		Total current expen-diture (1)	Current expen. on the environ-ment (2)	Pct. of total current expendi-ture (1) / (2)	Of which services	Total invest-ments (3)	End-of-pipe invest-ments (4)	Integrated environ-mental invest-ments (5)	Total environ-mental invest-ments (4+5)	Pct. of total invest-ments (4+5) / (3)
		DKK mio.		pct.	DKK mio.					pct.
	Total industry	**123 519**	**728**	**0,6**	**445**	**8 543**	**205**	**101**	**306**	**3,6**
15	Food and beverages	22 106	152	0,7	116	1 509	34	27	61	4,0
16	Tobacco factories	460	0	0,0	0	20	0	0	0	0,3
17	Textile industry	3 759	57	1,5	52	175	0	1	1	0,4
18	Wearing apparel industry	1 615	1	0,0	0	43	0	0	0	0,0
19	Leather industry	487	0	0,0	0	15	0	1	1	9,3
20	Wood and wood products	3 564	144	4,0	92	234	28	17	45	19,2
21	Pulp and paper	3 401	138	4,0	88	249	30	12	41	16,5
22	Publishing, printing	7 449	6	0,1	5	651	0	0	0	0,0
23	Manufacture of refined petroleum products	0	0	0	0	0	0	0	0	0
24	Manufacture of chemicals	5 712	82	1,4	29	411	12	1	13	3,1
25	Manufacture of rubber and plastic	7 453	48	0,6	4	689	0	2	2	0,3
26	Manufacture of non-metallic mineral produc.	4 978	2	0,0	1	828	45	0	45	5,4
27	Manufacture of basic metals	2 932	5	0,2	5	159	8	13	21	13,3
28	Manufacture of fabricated metal products	12 562	21	0,2	21	774	40	3	44	5,6
29	Manufacture of machinery and equipment	19 404	52	0,3	25	855	0	21	21	2,5
30	Manufacture of office machinery and computers	1 208	3	0,2	0	26	0	0	0	0,0
31	Manufacture of other electrical machinery and apparatus	5 377	12	0,2	1	219	0	0	0	0,0
32	Mfr. of telecommunications equipment	2 757	0	0,0	0	366	7	0	7	2,0
33	Manufacture of medical equipment, optical instruments, watches and clocks	4 263	5	0,1	4	376	0	1	1	0,3
34	Manufacture of motor vehicles	2 704	1	0,0	0	251	0	1	1	0,3
35	Manufacture of other transport equipment	2 253	0	0,0	0	81	0	0	0	0,3
36	Furniture industry and other manufacturing industries	7 984	0	0,0	0	429	0	1	1	0,3
37	Recycling of waste products	1 092	0	0,0	0	182	0	0	0	0,0

4.5 Manufacturing enterprises employing over 250 persons

The sample survey for large enterprises was not representative

For manufacturing enterprises with over 250 employees, it appears from tables 10 and 11 that the pilot survey conducted on the basis of a very small sample, which was not compulsory, resulted in major statistical problems related to the industries: Manufacture of chemicals and Manufacture of machinery and equipment. Here, the simple grossing up of the data reported showed that there were great differences compared to the data already available from the accounts registers maintained by Statistics Denmark. Here, many efforts need to be made in order to correct this factor, when the statistics are made compulsory.

Table 10 **First grossing up of environmental expenditure (+250 employees)**

NACE code		Current expenditure	Estimated environmental current expenditure	Current costs on services estimated investments	Estimated total investments	Estimated end-of-pipe investments	Estimated integrated investments
		DKK mio.					
15	Food and beverages	40 872	310	127	4 277	218	37
16	Tobacco factories	1 664	0	0	119	0	0
17	Textile industry	0	0	0	0	0	0
18	Wearing apparel industry	0	0	0	0	0	0
19	Leather industry	4 797	1	1	164	3	3
20	Wood and wood products	0	0	0	0	0	0
21	Pulp and paper	5 043	204	130	226	27	17
22	Publishing, printing	20 748	17	13	692	0	37
23	Manufacture of refined petroleum products	0	0	0	0	0	0
24	Manufacture of chemicals	82 355	1 183	421	8 137	242	0
25	Manufacture of rubber and plastic	6 017	39	4	947	0	1
26	Manufacture of non-metallic mineral produc.	5 495	9	3	193	4	2
27	Manufacture of basic metals	0	0	0	0	0	0
28	Manufacture of fabricated metal products	0	0	0	0	0	0
29	Manufacture of machinery and equipment	97 916	76	58	2 389	15	76
30	Manufacture of office machinery and computers	0	0	0	0	0	0
31	Manufacture of other electrical machinery and apparatus	0	0	0	0	0	0
32	Mfr. of telecommunications equipment	0	0	0	0	0	0
33	Manufacture of medical equipment, optical instruments, watches and clocks	17 058	21	15	1 039	0	0
34	Manufacture of motor vehicles	0	0	0	0	0	0
35	Manufacture of other transport equipment	0	0	0	0	0	0
36	Furniture industry and other manufacturing industries	0	0	0	0	0	0
37	Recycling of waste products	0	0	0	0	0	0

Table 11 **Second grossing up of environmental expenditure (+250 employees)**

NACE code		Total current expenditure	Environ. current ex.	Of which services	Total investments	EOPI	Integrated	Environmen. investments
		DKK mio.						
15	Food and beverages	96 169	729	300	5 040	256	43	300
16	Tobacco factories	2 200	1	0	112	0	0	0
17	Textile industry	N/A	N/A	N/A	N/A	N/A	N/A	N/A
18	Wearing apparel industry	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Leather industry	2 398	1	1	82	2	1	3
20	Wood and wood products	N/A	N/A	N/A	N/A	N/A	N/A	N/A
21	Pulp and paper	4 262	172	110	185	22	14	36
22	Publishing, printing	11 870	10	8	860	0	46	46
23	Manufacture of refined petroleum products	N/A	N/A	N/A	N/A	N/A	N/A	N/A
24	Manufacture of chemicals	35 674	512	182	3 492	104	0	104
25	Manufacture of rubber and plastic	7 501	48	5	1 031	0	1	1
26	Manufacture of non-metallic mineral produc.	6 761	11	4	649	14	6	21
27	Manufacture of basic metals	N/A	N/A	N/A	N/A	N/A	N/A	N/A
28	Manufacture of fabricated metal products	N/A	N/A	N/A	N/A	N/A	N/A	N/A
29	Manufacture of machinery and equipment	31 830	25	19	1 693	11	54	65
30	Manufacture of office machinery and computers	N/A	N/A	N/A	N/A	N/A	N/A	N/A
31	Manufacture of other electrical machinery and apparatus	N/A	N/A	N/A	N/A	N/A	N/A	N/A
32	Mfr. of telecommunications equipment	N/A	N/A	N/A	N/A	N/A	N/A	N/A
33	Manufacture of medical equipment, optical instruments, watches and clocks	7 503	5	3	887	0	0	0
34	Manufacture of motor vehicles	N/A	N/A	N/A	N/A	N/A	N/A	N/A
35	Manufacture of other transport equipment	N/A	N/A	N/A	N/A	N/A	N/A	N/A
36	Furniture industry and other manufacturing industries	N/A	N/A	N/A	N/A	N/A	N/A	N/A
37	Recycling of waste products	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Results for large enterprises are subject to wide margins of uncertainty

The final grossing up of manufacturing enterprises with over 250 employees shows in table 12 that environmental expenditure reached about 0.7 pct. of total current expenditure and that environmental investments made up just under 4 pct. of total investment expenditure. These results must be considered to be subject to wide margins of uncertainty, especially against the background of, e.g. the problems related to the industries: Manufacture of chemicals and Manufacture of machinery and equipment.

Table 12 **Final grossing up of environmental expenditure in the manufacturing industry (+250 employees)**

NACE code		Total current expenditure (1)	Current expenditure on environment (2)	Pct. of total current expenditure (1) / (2)	Of which services	Total investments (3)	End-of-pipe investments (4)	Integrated environmental investments (5)	Total environmental investments 4+5)	Pct. of total investments (4+5) / (3)
		DKK mio.		pct.	DKK mio.					pct.
	Total industry	**278 251**	**1 873**	**0,7**	**819**	**18 914**	**511**	**218**	**729**	**3,9**
15	Food and beverages	96 169	729	0,8	300	5 040	256	43	300	5,9
16	Tobacco factories	2 200	1	0,0	0	112	0	0	0	0,0
17	Textile industry	995	13	1,3	12	249	0	1	1	0,3
18	Wearing apparel industry	848	0	0,0	0	21	0	0	0	0,0
19	Leather industry	2 398	1	0,0	1	82	2	1	3	3,6
20	Wood and wood products	4 474	181	4,0	115	427	51	31	82	19,2
21	Pulp and paper	4 262	172	4,0	110	185	22	14	36	19,2
22	Publishing, printing	11 870	10	0,1	8	860	0	46	46	5,3
23	Manufacture of refined petroleum products	6 823	98	1,4	35	156	5	0	5	3,0
24	Manufacture of chemicals	35 674	512	1,4	182	3 492	104	0	104	3,0
25	Manufacture of rubber and plastic	7 501	48	0,6	5	1 031	0	1	1	0,1
26	Manufacture of non-metallic mineral produc.	6 761	11	0,2	4	649	14	6	21	3,2
27	Manufacture of basic metals	5 396	9	0,2	9	347	18	28	46	13,3
28	Manufacture of fabricated metal products	4 997	8	0,2	8	345	18	28	46	13,3
29	Manufacture of machinery and equipment	31 830	25	0,1	19	1 693	11	14	25	1,5
30	Manufacture of office machinery and computers	0	0	0	0	0	0	0	0	0
31	Manufacture of other electrical machinery and apparatus	20 168	47	0,2	5	1 565	0	0	0	0,0
32	Mfr. of telecommunications equipment	9 055	0	0,0	0	547	11	0	11	2,0
33	Manufacture of medical equipment, optical instruments, watches and clocks	7 503	5	0,1	3	887	0	0	0	0,0
34	Manufacture of motor vehicles	3 949	1	0,0	1	100	0	0	0	0,3
35	Manufacture of other transport equipment	5 946	1	0,0	1	237	0	1	1	0,3
36	Furniture industry and other manufacturing industries	9 430	2	0,0	1	892	0	3	3	0,3
37	Recycling of waste products	0	0	0	0	0	0	0	0	0

4.6 Supply enterprises

Missing enterprise-related accounts data

When the questionnaires had been mailed to the enterprises, it proved that Statistics Denmark did not have any existing enterprise-related accounts data for these industries. As participation in the survey was voluntary, Statistics Denmark held the view that it would not be expedient to subsequently collect this information from the enterprises. This implied that it was not possible to gross up the collected data for compiling reliable statistics, and we have therefore decided not to publish the results thus achieved by Statistics Denmark in the basic database.

Extension of questionnaire is needed for these industries

For these two industries the pilot survey showed that it will in the future be necessary to extend the questionnaire, so that questions are included with respect to both data on current expenditure and data on investments. Consequently, two sets of questionnaires will have to be mailed out.

Other problems related to this industry group

The work conducted concerning the questionnaires for this industry group also showed some other problems than those known beforehand by Statistics Denmark. Many of the enterprises engaged within Electricity, gas and steam and hot water supplies stated that they act as a kind of "transmission or trading enterprises", and which did not themselves produce the services in question, but were only acting as intermediaries, and the enterprises only had small office premises at their disposal. They frequently distributed electricity and gas via other enterprises. These problems must be subject to a further examination before compilation of the compulsory statistics is initiated. A number of more detailed definitions are probably required in the Danish Central Business Register.

Problems related to public ownership – who has the information?

Secondly, it can be established that public ownership is very common within thses industries. This causes problems with respect to where the necessary information about the enterprises is available (from the enterprise, from the parent company, from the municipality or from the county), and whether there is a kind of duplicate counting of the environmental expenditure in the public sector.

These factors concerning ownership and data capture must be clarified before the statistics are extended and compiled on a full scale.

4.7 Environmental domains

Large problems involved in distributing expenditure by environmental domains

It has generally been very difficult for the enterprises to provide usable information concerning the environmental domains. Many data have stuck out in several different directions. It is obvious that it is within this domain that the future work must be carried out. The information received by Statistics Denmark from the enterprises concerning, e.g. Waste and Waste water do not harmonize with the existing statistics relating to this domain. If the necessary staff resources had been available to Statistics Denmark, we would have contacted these enterprises again in order to verify the information reported, and many of the errors would, most likely, have been corrected, as this information is frequently readily available from the accounting systems of the enterprises. Tables concerning expenditure distributed by domains are shown in Annex 1.

5 Evaluation of the survey

5.1 Results from the survey

- The survey has shown that it is technically possible to use the method chosen, but there is still a long to go before the survey results can be assumed to be representative.
- The survey has clearly shown that the sample was not sufficiently large to capture data from all industries and from all enterprise size groups, but

the survey has created a better basis for conducting better stratified samples in the future.

- The survey has also shown that it is necessary to have legal requirements for collecting the data, as voluntary participation in the survey resulted in a large response rate.
- It is also important that the future stratification takes into account the difficulty of obtaining valid data for these industries – there are, especially problems in Manufacture of chemicals and Manufacture of machinery and equipment.
- The survey has shown that the necessary enterprise-related background variables for the manufacturing industry are available to Statistics Denmark, so that a reasonably reliable grossing up of the data reported can be conducted.
- The survey has also shown that sufficiently reliable enterprise-related information for the supply enterprises is *not* available to Statistics Denmark, so that it is impossible to conduct a reasonably reliable grossing up of the data material received.
- The survey has shown that it will be necessary to extend the questionnaire for these enterprises in order to receive information on total current expenditure and investment expenditure of the enterprises.
- The survey has shown that it is still difficult for the enterprises to fill in the questionnaire, although it has been prepared in such a way that it should be easy to read and understand. The reason for this is that the information requested is not always readily available from the information systems of the enterprises. Frequently, a qualified estimate has to be made, which is difficult for many respondents – it is almost contrary to their nature.
- The pilot project has not created a reliable basis for assessing the enterprises' possibilities of indicating the various environmental domains on a sufficient basis. However, it is our assumption that when the survey is made compulsory, the number of questionnaires will increase, and when Statistics Denmark has been provided with the necessary resources to assist the enterprises, this problem will presumably be considerably reudced.

5.2 Future development of the questionnaire design

The questionnaire was generally considered to be satisfactory

The questionnaire prepared was generally considered to be satisfactory with respect to the manufacturing enterprises. Experience has shown that the quality of completing the questionnaire will be enhanced when the enterprises have become used to the survey. Similarly, it must be expected that a close follow-up by Statistics Denmark will have to be conducted during the first couple of years. (e.g. by means of telephone interviews).

The questionnaire for the supply enterprises must contain two more spaces

However, the questionnaires for the supply enterprises proved to be defective in relation to the data available to Statistics Denmark. Consequently, it will be necessary in the future to expand the questionnaires by including two additional spaces concerning total investments and total current expenditure of the enterprises.

5.3 Proposal for the future organisation of the work

Data on environmental expenditure are always subject to margins of uncertainty

The margins of errors inherent in the figures are both caused by random errors and by various problems of measurement. For all types of environmental protection costs, it is difficult to undertake correct measurements, and it is therefore important to focus on the problems of measurement in the future surveys. This implies that focus must be directed at the quality of the figures reported by the enterprises.

Better data quality

Against this background, resources in the future collection of data must be directed at increasing the quality of the data reported by making follow-up interviews of the respondents concerning the data reported by the enterprises.

Compulsory survey is necessary

If the results are to be valid, it is imperative that the data collection is made compulsory, so that the enterprises cannot refrain from filling out the questionnaires mailed.

Well-developed procedure is necessary

However, making participation in the survey compulsory contravened with the objective of the Danish government aiming at reducing the administrative burdens of the enterprises. The character and legal status of the statistics will probably necessitate that Statistics Denmark has to establish a well-developed reminder procedure. Similarly, it must be expected that the data material reported is, at first, so defective that for a majority of the questionnaires reported it will be necessary to conduct follow-up telephone interviews with the enterprises.

Man-years in the future

The survey seems to indicate that compiling statistics on environmental expenditure for the Danish manufacturing industry on a full scale will require about 3.4 man-years at Statistics Denmark.

6 References

Julie L. Hass and Tone Smith (2002): *Methodology Work for Environmental Protection Investment and Current Expenditures in the Manufacturing Industry. Final Report to Eurostat.* Documents 2000/3, Statistics Norway.

Laban Koch Karlshøj (2002): *Survey of the possibilities of collecting questionnaire-based data on environmental protection expenditure for the manufacturing industry.* Statistics Denmark.

Eurostat (2001): *Environmental Expenditure Statistics, Industry Data Collection Guidebook*.

Annex 1 Environmental domains

Table1 **Current costs distributed by environmental domains, number of replies, and share of total current expenditure**

NACE		Total	Waste water		Waste		Air and climate		Other	
		N	N	Pct.	N	Pct.	N	Pct.	N	Pct.
15	Food and beverages	17	13	0,6	12	0,2	5	0,1	7	0,1
16	Tobacco factories	1	1	0,0	1	0,0				
17	Textile industry	5	4	0,6	5	0,2	2	0,0	2	0,0
18	Wearing apparel industry	3			1	0,0				
19	Leather industry	2			2	0,0				
20	Wood and wood products	0								
21	Pulp and paper	1	1	2,1	1	1,9	1	0,0	1	0,1
22	Publishing, printing	6	2	0,0	3	0,2			1	0,1
23	Manufacture of refined petroleum products	0								
24	Manufacture of chemicals	6	5	0,8	5	0,3	4	0,3	5	0,5
25	Manufacture of rubber and plastic	1	1	0,1	1	0,2	1	0,0	1	0,4
26	Manufacture of non-metallic mineral produc.	10	5	0,1	7	1,4	2	0,0	2	9,0
27	Manufacture of basic metals	0								
28	Manufacture of fabricated metal products	2			2	0,1				
29	Manufacture of machinery and equipment	12	6	0,0	7	0,0	4	0,0	4	0,0
30	Manufacture of office machinery and computers	0								
31	Manufacture of other electrical machinery and apparatus	2	1	0,0	2	0,1	2	0,0	1	0,1
32	Mfr. of telecommunications equipment	1								
33	Manufacture of medical equipment, optical instruments, watches and clocks	1	1	0,0	1	0,0	1	0,0	1	0,0
34	Manufacture of motor vehicles	0								
35	Manufacture of other transport equipment	0								
36	Furniture industry and other manufacturing industries	3	1	0,0	1	0,0				
37	Recycling of waste products	0								
40	Electricity, gas, steam and hot water supply	17	0		0		0		0	
41	Water supply	6			0				0	

Table 2 **End-of-pipe investments distributed by environmental domain, number of replies, and share of total investments**

NACE		Total	Waste water		Waste		Air and climate		Other	
		N	N	Pct.	N	Pct.	N	Pct.	N	Pct.
15	Food and beverages	17	8	1,3	5	0,6	2	0,1	1	0,0
16	Tobacco factories	1								
17	Textile industry	5	1	11,5						
18	Wearing apparel industry	3								
19	Leather industry	2	1	0,7	1	1,2				
20	Wood and wood products	0								
21	Pulp and paper	1	1	3,3	1	1,5	1	1,5	1	1,4
22	Publishing, printing	6	1	32,8						
23	Manufacture of refined petroleum products	0								
24	Manufacture of chemicals	6								
25	Manufacture of rubber and plastic	1	1	0,1	1	0,1				
26	Manufacture of non-metallic mineral produc.	10	1	1,0						
27	Manufacture of basic metals	0								
28	Manufacture of fabricated metal products	2	1	64,7						
29	Manufacture of machinery and equipment	12	3	37,3	2	0,7	1	2,0	1	0,9
30	Manufacture of office machinery and computers	0								
31	Manufacture of other electrical machinery and apparatus	2								
32	Mfr. of telecommunications equipment	1								
33	Manufacture of medical equipment, optical instruments, watches and clocks	1								
34	Manufacture of motor vehicles	0								
35	Manufacture of other transport equipment	0								
36	Furniture industry and other manufacturing industries	3	1	5,1						
37	Recycling of waste products	0								
40	Electricity, gas, steam and hot water supply	17	0		0					
41	Water supply	6	0							

Table 3 **Integrated environmental investments distributed by environmental domains, number of replies, and share of total investments**

NACE		Total	Waste water		Waste		Air and climate		Other	
		N	N	Pct.	N	Pct.	N	Pct.	N	Pct.
15	Food and beverages	17	4	0,8	3	0,2	3	0,1	5	1,6
16	Tobacco factories	1								
17	Textile industry	5			1	11,5				
18	Wearing apparel industry	3								
19	Leather industry	2					1	1,6		
20	Wood and wood products	0								
21	Pulp and paper	1	1	5,3			1	2,1		
22	Publishing, printing	6	1	6,6						
23	Manufacture of refined petroleum products	0								
24	Manufacture of chemicals	6								
25	Manufacture of rubber and plastic	1					1	0,1	1	0,1
26	Manufacture of non-metallic mineral produc.	10					1	1,0		
27	Manufacture of basic metals	0								
28	Manufacture of fabricated metal products	2					1	64,7		
29	Manufacture of machinery and equipment	12					3	8,6	1	1,4
30	Manufacture of office machinery and computers	0								
31	Manufacture of other electrical machinery and apparatus	2								
32	Mfr. of telecommunications equipment	1								
33	Manufacture of medical equipment, optical instruments, watches and clocks	1								
34	Manufacture of motor vehicles	0								
35	Manufacture of other transport equipment	0								
36	Furniture industry and other manufacturing industries	3					1	2,6		
37	Recycling of waste products	0								
40	Electricity, gas, steam and hot water supply	17	1		1		3			
41	Water supply	6							1	

Questionnaire and folder

DANMARKS
STATISTIK

CVR-nr.

Industriens omkostninger til miljøbeskyttelse

Undersøgelsens formål er at give et overblik over hvor store omkostninger industrien har til miljø- beskyttelse. Omkostninger til miljøbeskyttelse omfatter alt fra udgifter til fx bortskaffelse af affald, til større investeringer i udstyr til rensning af udslip fra eksempelvis energiproduktion.

Det er kun den miljøbeskyttelse virksomheden foretager, som respons på krav udefra, der skal med i opgørelsen, - krav fra eksempelvis myndigheder, naboer, kunder, og andre interessenter.

Tiltag, som er foretaget pga. sundheds- og sikkerhedsmæssige, tekniske eller rent økonomiske årsager, skal ikke indgå i denne undersøgelse, selvom de har haft en positiv virkning på miljøet.

Omkostningerne skal opdeles på:

- **Driftsudgifter til miljøbeskyttelse**

- **Investeringer til bekæmpelse af forurening**

- **Investeringer til forebyggelse af forurening**

Herudover skal omkostningerne fordeles på de fire miljøområder:

Spildevand og afløb - Affald - Luft/klima - Andet.

Send spørgeskemaet ind, selvom virksomheden ikke har haft udgifter til miljøbeskyttelse.
Alle svar er vigtige for undersøgelsens kvalitet.

Med venlig hilsen

Danmarks Statistik

Ulla Agerskov/Vibeke Vestskov Terney

DSt 2022-30 A-1.200-41.2003 DSt-Tryk

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Driftsudgifter til miljøbeskyttelse

Hvad skal med?

- Lønudgifter til ansatte som arbejder med miljøspørgsmål, rapportering og forureningstilladelser og udgifter til eksterne konsulenter mv.
- Udgifter til forureningstilladelser, affalds- og spilde- vandsafgifter mv.
- Meromkostninger forbundet med miljøhensyn ved køb af varer og kontorartikler mv.
- Drift, reparation og vedligeholdelse af miljøudstyr, samt udgifter til leasing af udstyr.

Hvad skal ikke med?

- Generelle miljøskatter, fx CO-afgifter, afskrivninger og renter på lån.
- Miljørelaterede bøder eller kompensation til tredje part for skader knyttet til miljøskadeligt udslip.

Eksempler

Spildevand og afløb
Fx overvågnings- og analyseudgifter, afgifter, behandling af spildevand, indkøb af miljørigtige hjælpestoffer.

Affald
Fx affaldsbehandling, affaldsafgifter, sortering, dehydrering, overvågnings- og analyseafgifter, affaldsforebyggende foranstaltninger

Luft/klima
Fx brug af filtre, overvågning, analyseudgifter, udgifter relateret til udslipstilladelser, energiforbrug relateret til miljøforanstaltninger.

Anden miljøbeskyttelse
Fx driftsudgifter til behandling af forurenet jord eller grundvand, indsamling af miljøinformation, miljøledelse.

Investeringer til bekæmpelse af forurening

Investeringer i udstyr og anlæg til bekæmpelse af den forurening, som virksomheden *har* skabt.

Det skal være udstyr, der er uafhængigt af selve produktionsprocessen, og som enten behandler, forhindrer, kontrollerer eller måler den forurening, som er opstået i forbindelse med produktionen.

Udstyret betegnes også "end-of-pipe"-løsningen.

Eksempler

Spildevand og afløb
Fx anlæg til spildevandsbehandling, tanke til opbevaring af spildevand, måleinstrumenter.

Affald
Fx udstyr til sortering og behandling af affald, beholdere der udelukkende anvendes til affald, genbrugssystemer.

Luft/klima
Fx filtre, kølesystemer, katalysatorer til behandling af procesgasser, renseudstyr, overvågningsudstyr.

Anden miljøbeskyttelse
Udstyr til fx begrænsning af forbruget af grundvand, rensning af forurenet jord, støjdæmpning.

Investeringer til forebyggelse af forurening

Investeringer i udstyr med integrerede miljøforanstaltninger, som har til formål at mindske udledningen af forurenende stoffer eller begrænse de forurenende aktiviteter.

Hvilke investeringer skal med?

- Hvis hele formålet med investeringen var at reducere udslippet eller forbedre miljøet, angives hele investeringen.
- Hvis formålet med investeringen var en mere effektiv produktionsproces kombineret med miljøbeskyttelsesforanstaltninger angives:
  - prisforskellen, hvis der på investeringstidspunktet fandtes et billigere alternativ til investeringen, som *ikke* havde de ønskede miljøeffekter.
  - meromkostninger, som skyldes miljøhensynet.

Hvilke investeringer skal ikke med?

- Investeringer i anlæg eller udstyr, som er blevet standardteknologi.
- Investeringsudgifter, hvor det ikke er muligt at give et overslag på miljødelen af investeringen.

Eksempler

Spildevand og afløb
Fx kontroludstyr, reduceret forbrug eller genbrug af vand, systemer med forbedret dosering af rengøringsmiddel.

Affald
Fx "renere" produktionsteknologier, som medfører en reduktion i affaldet eller skaber mindre skadelige affaldstyper, reduktion af brugen af inputs, mere miljøvenlige råvarer/inputs i produktionen.

Luft/klima
Fx systemer for dampudveksling og recirkulation af procesgasser, kontrolsystemer for optimal forbrænding/drift.

Anden miljøbeskyttelse
Fx dobbeltvæggede tanke installeret for værn af jord og grundvand, støjdæmpende udstyr.

Generelt

1 Da det sjældent fremgår direkte af årsregnskabet, hvor stor miljøandelen er, må der gerne i dette spørgeskema indgå virksomheden "bedste skøn" over udgifter og investeringer, som var knyttet til forureningsbeskyttelse i 2001

2 Alle omkostninger i denne undersøgelse regnes brutto, dvs. at eventuelle gevinster i form af biprodukter, ressourcebesparelser eller modtagne subsidier ikke skal indregnes.

3 Beløbene skal føres ekskl. moms og finansiel støtte.

4 Ingen udgifter til miljøbeskyttelse angives ved at skrive "0" i felterne.

Driftsudgifter til miljøbeskyttelse

	Spildevand og afløb	Affald	Luft/klima	Andet
	1.000 kr. ekskl. moms	1.000 kr. ekskl. moms	1.000 kr. ekskl. moms	1.000 kr. ekskl. moms
Heraf eksterne tjenesteydelser	pct.	pct.	pct.	pct.

Investeringer til bekæmpelse af forurening

Spildevand og afløb	Affald	Luft/klima	Andet
1.000 kr. ekskl. moms	1.000 kr. ekskl. moms	1.000 kr. ekskl. moms	1.000 kr. ekskl. moms

Investeringer til forebyggelse af forurening

Beskrivelse af investeringen Beskriv alle større investeringer, mindre investeringer lægges sammen til en samlet post.	**Investering** 1.000 kr.	**Miljøandel** pct.	Hovedmiljøformål, sæt kun ét kryds			
			Spilde-vand og afløb	Affald	Luft/ klima	Andet
			☐	☐	☐	☐
			☐	☐	☐	☐
			☐	☐	☐	☐
			☐	☐	☐	☐
			☐	☐	☐	☐
			☐	☐	☐	☐

Skriv eventuelle bemærkninger til spørgeskemaet her:

Kontaktperson som Danmarks Statistik kan henvende sig til ved spørgsmål angående besvarelsen:

Navn: Tlf. nr.: E-post:

Dato Underskrift

Udgifter skal også fordeles på fire miljøformål

Udgifterne skal kategoriseres efter, hvilket miljøformål de hovedsageligt er rettet mod. Hvis et tiltag dækker mere end et formål skal udgifterne placeres på hovedformålet:

1) **Beskyttelse af luft og klima**
2) **Spildevand**
3) **Affald**
4) **Andre**

Fordelingen udspringer af det fælleseuropæiske klassifikationssystem CEPA 2000: *Classification of Environmental Protection Activities*.

Klassifikationssystemet dækker økonomiske aktiviteter i forbindelse med miljøbeskyttelse. CEPA 2000 opererer med ni selvstændige miljøbeskyttelsesgrupper.

CEPA 2000.

a) Beskyttelse af luft og klima
b) Spildevand
c) Affald
d) Beskyttelse og forbedring af jord, grundvand og overfladevand
e) Larm og støjgener
f) Beskyttelse af biodiversitet og landskab
g) Beskyttelse af stråling
h) Forskning og udvikling
i) Andre miljøbeskyttelsesaktiviteter: Generel miljøadministration og ledelse, uddannelse, træning og information, udelelige udgifter og udgifter, som ikke kan placeres.

Ved tvivlsspørgsmål

Ved tvivlsspørgsmål i forbindelse med blankettens udfyldelse er De velkommen til at rette henvendelse til:

Ulla Agerskov
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Danmarks Statistik
Oktober 2003

Industriens omkostninger til miljøbeskyttelse

Hvad, hvorfor og hvordan?

DANMARKS STATISTIK

Hvad er miljøbeskyttelsesudgifter?

Miljøbeskyttelsesudgifter er udgifter knyttet til tiltag og aktiviteter, som har til *hovedformål* at forebygge, reducere eller behandle forurening eller andre skader på det fysiske miljø. Desuden skal miljøbeskyttelsen være foretaget som en reaktion på krav udefra, - krav fra eksempelvis myndigheder, naboer, kunder og andre interessenter.

Vi spørger i skemaet efter tre typer miljøbeskyttelsesudgifter:

1) **Driftsudgifter**
2) **Investeringer til bekæmpelse af forurening (end-of-pipe)**
3) **Investeringer til forebyggelse af forurening (integrerede løsninger)**

Da det sjældent fremgår direkte af årsregnskabet, hvor stor miljøandelen er, må der gerne i dette spørgeskema indgå *virksomhedens bedste skøn* over udgifter og investeringer knyttet til miljøbeskyttelse i 2001.

Hvad er *ikke* miljøbeskyttelsesudgifter?

Hvis udgiften ikke er direkte rettet mod miljøbeskyttelse og aktiviteter, der gennemføres af tekniske, sikkerhedsmæssige eller hygiejnemæssige årsager skal ikke indgå, selvom de har nogle afledte gunstige miljøeffekter.

Lovgivning

Undersøgelsen er med til at forberede en fremtidig opfyldelse af EU's statistikstrukturforordnings (SBS-Regulation) nye betingelser for obligatorisk statistik for miljøomkostninger fordelt på:

- industriens investeringer i forureningsforebyggende teknologier
- industriens investeringer i forureningsbekæmpende teknologier
- og driftsudgifter til miljøbeskyttelse.

Det skal bemærkes at deltagelse i denne undersøgelse *ikke* er obligatorisk.

Miljøindsatsen skal fordeles på udgiftstyper

Virksomhedens indsats mod forurening er delt op i løbende driftsudgifter til miljøbeskyttelse og investeringer til hhv. bekæmpelse og forebyggelse af forurening. Spørgeskemaet er delt op i tre afsnit:

Driftsudgifter

Angiv her driftsudgifter - herunder lønninger, energi og varer samt køb af tjenester mv. - hvis hovedformål er at undgå, reducere, behandle eller eliminere forurening forårsaget af virksomheden. Afskrivninger på udstyr og skattebetalinger skal ikke medtages.

Vi vil også gerne have udspecificeret, hvor stor en andel af de samlede driftsudgifter, der er gået til køb af eksterne tjenester, som eksempelvis afhentning af affald.

Investeringer til bekæmpelse af forurening

Disse investeringer kendetegnes ved, at de ikke påvirker selve produktionsprocessen. Angiv her investeringer i teknologier, processer eller udstyr designet til at indsamle, opbevare eller fjerne forureningen *efter* den er opstået i produktionsprocessen. Angiv også investeringer i måleudstyr her.

Investeringer til forebyggelse af forurening

Forureningsforebyggende investeringer påvirker selve produktionsprocessen og kan være kendetegnet ved:

- at de mindsker omfanget af forureningen
- at der kan anvendes mindre miljøbelastende inputs
- at de omfatter processer, som giver en mindre påvirkning af miljøet

De skal under dette punkt kort beskrive hver enkelt investering. Det er den samlede investering i udstyret, vi vil bede Dem oplyse, suppleret med den procentandel, der er knyttet til forureningsforebyggelsen.

Hvis fx den samlede investering er 1.000,- kr. og hele formålet med investeringen var at mindske miljøpåvirkningen, angiv da: **1.000,- kr.** og **100 pct.**

Hvis fx den samlede investering er 1.000,- kr., og miljøandelen anslås til 10 pct. angiv da: **1.000,- kr.** og **10 pct.**