

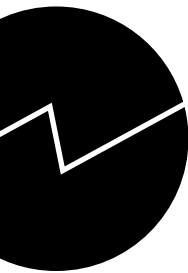
Statistics Norway  
Department of Economic Statistics

*Julie L. Hass*

Documents

**Compilation of data on  
expenditure in Environmental  
protection by businesses**

Report to the European Commission  
DG for Environment



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**Abstract:**

Establishing environmental protection expenditure statistics for the manufacturing, mining and quarrying, and steam and hot water supply industries has been a step-wise process over the three year project period. Statistics for the manufacturing, mining and quarrying industries were developed for end-of-pipe investment for 2000 and 2001, while for 2002 all three environmental protection expenditure variables were developed. These three variables are: end-of-pipe investment, integrated technology investment and current expenditures. For the steam and hot water supply industry (NACE 40.3) end-of-pipe investment statistics were developed for 2001 and 2002. These statistics were developed by industry division and six environmental domains. The six environmental domains include: air/climate, wastewater/cooling water, waste, soil and groundwater, biodiversity and landscape, and other (which includes noise, R&D, management systems, etc.).

**Keywords:**

Environmental protection investment and expenditure in industry, end-of-pipe investment, integrated technology investment, pollution prevention, miljøvernkostnader

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# 1 Introduction

The main purpose of this project was to establish survey and reporting routines to enable Statistics Norway to comply with SBS regulation 58/97 regarding environmental protection expenditure in enterprises.

Statistics Norway is under pressure to streamline all work processes and to reduce the amount of reporting required from enterprises and establishments. Given these constraints, the reporting of environmental protection investment and current expenditure has been coordinated with the standard surveys for the industries required to be covered under the SBS regulation. This work has therefore been a cooperative project between the Division of environmental statistics and the Division for energy and industrial production statistics at Statistics Norway.

Establishing environmental protection expenditure in mining and quarrying, manufacturing, and steam and hot water supply industries has been a step-wise process over the three year project period. For the mining and quarrying and manufacturing industries (NACE 10, 12-37) end-of-pipe investment was obtained for 2000 and 2001 while in 2002 all three environmental protection expenditure variables were included. For the steam and hot water supply industry (NACE 40.3) end-of-pipe investment was obtained for 2001 and 2002.

Please note that due to the special nature of NACE 11 (Extraction of crude petroleum and natural gas) in Norway, this industry is excluded from the current work since this industry is not covered by the standard industrial statistical surveys. Work to include reporting for this industry is being developed separately and is not covered in this project.

Also due to the fact that nearly all electricity production is from hydro power sources, environmental protection expenditure in NACE E in this project has been limited to NACE 40.3 Steam and hot water supply industry, since it is this industry where there are emissions that can be controlled and reduced through the use of end-of-pipe type of equipment.

## 1.1 Environmental protection expenditure variables in the SBS regulation

There are three environmental protection expenditure variables included under the SBS regulation 58/97 as amended.

In the regulation these variables are identified as the following:

- Investments in end-of-pipe equipment (21 11 0)
- Investments in integrated technologies (21 12 0)
- Total current expenditure for environmental protection (21 14 0)

According to the regulation the variables shall also be broken down by four environmental domains:

- Ambient air and climate
- Wastewater management
- Waste management
- Other environmental protection activities

A Eurostat task force has provided definitions and guidelines to help countries' in the implementation of the environmental protection expenditure variables (Eurostat 2001). This work and earlier definitions for the variables were used to develop the specific questions in the questionnaires and in the examples and instructions provided to fill out the information.

Investments in end-of-pipe equipment (21 11 0) are also called investments in "pollution treatment" or known as "process external" equipment.

These are described as:

44. Pollution treatment investment is defined as capital expenditures for methods, technologies, processes or equipment designed to collect and remove pollution and pollutants (e.g. air emissions, effluents or solid waste) from the environment after their creation, prevent the spread of and measure the level of the pollution, and treat and dispose of pollutants generated by the operating activity of the company.

45. Pollution treatment investments include distinct, identifiable components supplementing existing equipment, which are implemented at the end of or completely outside the production line ("end-of-pipe" equipment).

46. Pollution treatment include investments in equipment (e.g. filters or separate cleaning steps) which compose or extract pollutants within the production line, when the removal of this equipment would not affect the functioning of the production line.  
(Eurostat 2001: 12)

Investments in integrated technologies (21 12 0) are also called investments in "pollution prevention" or known as "process internal" equipment.

These are described as:

48. Pollution prevention investment is defined as capital expenditures for new or adaptation of existing methods, technologies, processes, equipment (or parts thereof) designed to reduce or eliminate the creation of pollution, or change the composition of pollutants (e.g. toxicity), at the source, thereby reducing the environmental impacts associated with the release of pollutants and/or with polluting activities.

49. Included are investments needed when switching to new production inputs with lower environmental impacts....

#### *Integrated*

53. Pollution prevention also include capital expenditures for methods, processes, technologies and equipment that are integrated with the overall operating activity (production process/installation) in a way that may make it difficult to identify separately the pollution prevention component.

In these cases ("integrated measures"), only the environmental protection fraction of the total investment should be reported as an environmental protection expenditure.

This fraction corresponds to the incremental expenditure of the selected investment vis-à-vis the capital expenditure that would have been incurred were it not for the environmental protection considerations.  
(Eurostat 2001: 13)

Total current expenditure for environmental protection (21 14 0) is described as follows:

59. Current expenditure on environmental protection includes compensation of employees, payments of rents, use of energy and other material goods and purchases of services, where the main purpose is to prevent, reduce, treat or eliminate pollutants and pollution or any other degradation of the environment resulting from the operating activity of the company....

63. Current expenditure on environmental protection often occurs as a result of previous investment in environmental protection equipment, it includes the compensation of employees,

the payment of rents, consumption of goods and services necessary to run, repair and maintain the environmental protection facilities and equipment.

64. Current expenditure also occur when activities are undertaken which aim at the provision of environmental services such as environmental co-ordination, certification, training, information and research.

65. Current expenditure may also include the purchase of goods used for environmental protection purposes which are not used to run an environmental protection equipment (e.g. lime used to reduce air emissions), and any identifiable substantial incremental costs resulting from a switch to new production inputs or practices with lower environmental impacts.

66. Current expenditure includes the full cost of purchasing environmental protection services (fees, charges), which finance an environmental protection activity which is related to the environmental impacts of the operating activity of the company.  
(Eurostat 2001: 15-16)

Due to national interest and to the OECD/Eurostat joint questionnaire, more detailed environmental domains were included in the surveys for all three years. In 2000 the following five environmental domains were requested: air/climate, wastewater, waste, noise and other. In 2001 and 2002 the following six environmental domains were requested: air/climate, wastewater, waste, soil and groundwater, biodiversity and landscape, and other. For reporting to Eurostat for the SBS regulation these additional categories will simply be added to the category "other." For reporting to the OECD/Eurostat joint questionnaire for environmental protection expenditure and revenues, these categories will be reported separately as requested in that reporting system.

## **1.2 Brief description of the project strategy**

There are two surveys that needed to be modified to include the new variables. One survey focuses on the mining and quarrying and manufacturing industries (NACE 10, 12-37) and the other survey is specific for the steam and hot water supply industry (NACE 40.3).

Since both of the surveys are conducted at the establishment level it was decided to also request environmental protection expenditure data at the establishment level and not at the more aggregate enterprise level as is specified in the SBS regulation. Based on experience from the 1997 pilot study (Hass, et al., 2000), it was evaluated that environmental protection expenditures information is available at the establishment level (or lower) and therefore it is appropriate to request this from establishments. In the future we plan to try to combine emissions information and environmental protection expenditure information and it is desirable to have the information for the same entities, i.e. establishments. This also meant that no major changes in the procedures for the standard manufacturing survey were necessary and the existing survey instruments could simply be modified by adding the new questions.

The initial approach taken in both surveys was to include a question regarding investment in pollution treatment equipment, also called end-of-pipe investment, by simply adding an additional specification in the sections of the surveys that request information regarding total investments in the establishments. Responding to the structural statistics questionnaire is obligatory so by including the environmental questions in this questionnaire, responding will also be obligatory.

For NACE 10, 12-37 (mining and quarrying, manufacturing industries) end-of-pipe investments was requested as part of the standard industry survey for 2000 and 2001 and was included in the survey sent to all enterprises in Norway (census). For 2002 a sample survey was used and a separate four page survey instrument that included all three environmental protection expenditure variables was sent

to establishments in the sample along with the other industry statistics questionnaires for those establishments. See appendices for examples of the questionnaires.

For NACE 40.3 (steam and hot water supply industry) end-of-pipe investments were requested as part of the standard survey for this industry for 2001 and 2002. This was done by including a specific question regarding end-of-pipe investments in section 13 of the standard questionnaire sent to all enterprises in this industry in Norway (census).

By fully coordinating the data collection for environmental protection expenditure with the standard industry statistics surveys this also allows for coordinating the controlling and editing of the data against standard variables such as total investment and total current expenditures.

## **2 Mining and Quarrying and Manufacturing Industries (NACE 10, 12-37)**

### **2.1 2000 Data collection methodology for NACE 10, 12-37**

In developing this survey it was determined that the most cost-effective approach to implement the required collection of environmental protection investment and current expenditure data would be to include this variable into the standard industry statistics questionnaire rather than to set up a totally separate survey administered by the Division for environmental statistics.

The approach of simply expanding the standard manufacturing statistics survey to include the environmental variables takes advantage of the administrative apparatus that already exists for manufacturing statistics. The databases, controlling and editing processes and personnel, logistics and practical apparatus surrounding the mailing of questionnaires, optical reading of the returned questionnaires, reporting routines to Eurostat, etc. can simply be expanded to include the new variables. Also by including this question on the manufacturing survey questionnaire, responding also becomes obligatory and this requirement should help with increasing the response rate.

#### **2.1.1 General information regarding the 2000 survey of the manufacturing, mining and quarrying industries**

Since the question regarding investment in equipment and plant for pollution control (end-of-pipe) was included in the survey for manufacturing industries, the information regarding the coverage, data sources and data collection is the same for the environment variable as for all of the other variables.

##### *Coverage*

The annual manufacturing statistics cover local kind-of-activity units (LKAUs) in manufacturing, mining and quarrying, as defined by the Norwegian Standard Industrial Classification (SIC). Information on oil and gas extraction is not included. Enterprises with individual proprietorship where the owner is working alone (one-man enterprises), are not included in this survey. Furthermore, local KAUs with employment less than half a man-year worked are not included in the annual manufacturing statistics.

##### *Data sources and data collection*

The manufacturing statistics are prepared based on information from questionnaires and data from administrative registers. The manufacturing statistics' sample is based on a so-called cut-off sample where all local KAUs with at least ten employees at the time of sampling are included. In addition all local KAUs in multi-enterprises with at least one manufacturing local KAU with ten or more employees are included. A form and a copy of the standard financial report that the tax authorities collect from the enterprises ( the Standard Industry Form) are therefore collected from all enterprises with manufacturing activity with at least ten employees. The Standard Industry Form covers income statement and balance sheet which enterprises are required to report to the tax authorities.

**Table 1      Local kind-of-activity units (Local KAUs). Manufacturing Statistics. 2000**

	Number of local KAUs	Production value in bill. NOK	Employment
Population	11 763	496.5	286 479
Sample	4 845	464.4	256 093
Small local KAUs	6 918	32.1	30 386

In 2000, the population consisted of 11 763 local KAUs classified in manufacturing, mining and quarrying, and the tables are produced based on data from these local KAU. The local KAUs in the population from which Statistics Norway has collected data, make up the net sample and came to 4,845 in 2000. These 4 845 local KAUs made up 93.5 per cent of total production value and 89 per cent of total employment in manufacturing, mining and quarrying.

As many as 6 918 local KAUs were so-called small local KAUs. These we do not have any information on from the questionnaires, because they employed less than ten at the time the selection was made. The small local KAUs made up about 10 per cent of the employment in manufacturing, mining and quarrying in 2000, and 6.5 per cent of the production value. The figure for production value for the small local KAUs is an estimated figure as are other data from this group. The estimation methods are mainly based on estimations with a basis in the variables we have from other sources for the small local KAUs as well as from the sample.

Additional information and statistics for Manufacturing Statistics 2000 can be found in the publication NOS D 284 in the series Official Statistics of Norway ([Statistics Norway 2003](#)).

### **2.1.2      Environmental protection investment (end-of-pipe) in the 2000 industry survey**

Of the 4 845 local KAUs that were included in the sample, 545 reported at least one type of investment in equipment and plant for pollution control (end-of-pipe), or 11.2 per cent.

The figure below shows how the question was included in the questionnaire (see Appendix 6.1.1 for a copy of the complete questionnaire – Norwegian only). End-of-pipe investment was requested broken down by the following 5 environmental domains: air, wastewater, waste, noise and other.

The reported environmental protection investment data was controlled by comparing the total end-of-pipe investment amount (sum of post 597) against the amount for total investments (acquisitions) reported on the questionnaire (post 590 Acquisitions). The control was that the total environmental protection investment amount could not be greater than the total of the acquisitions reported as investments.

**Figure 1 Section of the 2000 standard industry questionnaire where end-of-pipe investment (Investeringer til miljøvern) is requested (with translation into English following)**

Investeringer til miljøvern (i 1000 kr)	Luft	Avløp	Avfall	Støy	Annet
597 Investeringer i anlegg og utstyr for rensing og utslippsreduksjon(end-of-pipe)					

Her føres utstyr som kan behandle, forhindre, kontrollere eller måle forurensing, bl.a. : Renseanlegg, rørledninger, skorsteiner, eksossystemer, forbrenningsovner, gjenvinningscontainere, deponier, inkluder overvåkingsutstyr og bygninger.)

English translation:

Investments in environmental protection (in 1000 kr)	Air	Wastewater	Waste	Noise	Other
597 Investments in plant and equipment for treatment and emissions reduction (end-of-pipe)					

Here one reports equipment that treats, reduces, controls or measures pollution, including: wastewater treatment plants, smoke stacks, pipelines, exhaust systems, incineration ovens, recycling containers, waste landfills, include control equipment and buildings

In the development of the statistics no estimates were made for the small local KAUs. The values reported were considered as if they were from a census survey and simply added together to give total values for this variable for the manufacturing, mining and quarrying industries.

Editing any type of investment reporting is difficult since these types of investments may not be done every year. There is also no expectation that all enterprises would have this type of investment every year. Exactly how many establishments would have this kind of investment is currently difficult to know and this will only be obtained through experience and with a longer time series of data. Therefore it is difficult to know whether the establishments not reporting any of this type of environmental protection investment actually did not have any or simply did not fill out the areas of the questionnaire. This potential non-response to this question will need to be considered in the future in the design of a separate questionnaire.

## 2.2 Publication of the 2000 NACE 10, 12-37 statistics on Statistics Norway's website

During the spring of 2002 the administrative procedures for establishing "Environmental protection expenditures in manufacturing, mining and quarrying industries" as official statistics within Statistics Norway's portfolio were conducted. It is now the intention that environmental protection expenditures in manufacturing, mining and quarrying industries will be a part of the annual manufacturing industry statistics produced and published. The current website reference for the English version for these statistics is: [http://www.ssb.no/english/subjects/01/06/20/miljokostind\\_en/](http://www.ssb.no/english/subjects/01/06/20/miljokostind_en/)

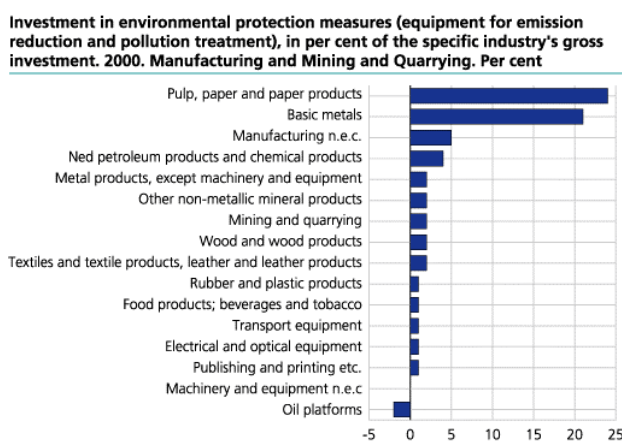
The following is a copy of the information published on the Statistics Norway's website for the 2000 environmental protection investments in end-of-pipe equipment in the manufacturing, mining and quarrying industries.

The table shows the most detailed level for publishing these figures. Most of the data is available at the 2-digit or division level and for NACE 15, 21 and parts of 24 the data are available at the 3-digit or group level. There are some problems with confidentiality due to the small number of establishments in some NACE groups. Currently in Norway there are only 2 refineries and so it is not possible to publish separate data for NACE 23. These data are published together with NACE 24.1 in the following table. There are no establishments (LKAUs) in NACE 24.2 Pesticides and other agro-chemical products or in NACE 24.7 Man-made fibers listed in the business register in Norway. For this reason these NACE groups have also been excluded from the tables.

## Metals industry invests the most in the environment

*5.1 per cent of total investments made by the manufacturing and the mining and quarrying industries in 2000 were for environmental protection measures. The total amount of investment was NOK 794 million. 35 per cent of these investments were directed towards reducing air emissions. The basic metals industry invested the greatest amount in environmental protection.*

The basic metals industry and the pulp and paper industry invested the most in environmental protection, measured both in terms of kroner and in terms of per cent of gross investments in the individual industries. Almost 21 per cent, or NOK 330 million, was invested by the basic metals industry in environmental protection measures. The corresponding values in the pulp and paper industry were 24 per cent and NOK 219 million (the values for the pulp and paper industry have a number of uncertainties and could be adjusted).



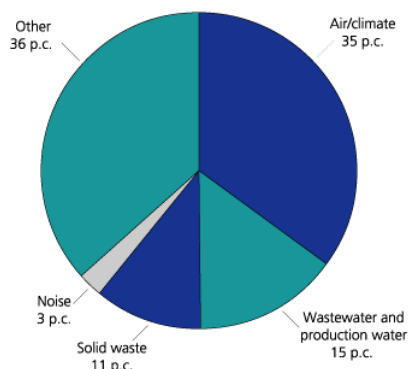
Although the investment amounts were not as large, the proportion of gross investment for environmental protection measures was large in the paint and varnishes industry, 22 per cent, and in the recycling industry, 17 per cent. In most cases, however, this type of investment accounted for only about 1-2 per cent of an industry's gross investment.

The manufacturing industry invested a total of NOK 782 million in equipment that reduces pollutant emissions (also called "end-of-pipe" investments or external process investments). This type of equipment is external to the production process and treats, prevents, controls or measures pollution. The other NOK 12 million were investments made by the mining and quarrying industry.

### Largest investment focuses on air emissions

The investments are also classified according to the domain to which the investment is primarily focused: air/climate, wastewater (including production water), waste, noise and other. 35 per cent of environmental protection investment was made to reduce air emissions. The corresponding values for wastewater and waste were 15 and 11 per cent, respectively.

Investment in environmental protection measures (equipment for emission reduction and pollution treatment), divided according to five environmental domains. 2000. Manufacturing and Mining and Quarrying. Per cent



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Please note that these statistics do not include all types of environmental protection investments in the manufacturing and the mining and quarrying industries. Investments in new or modified production processes where environmental protection equipment are integrated into the main production processes are more difficult to define and therefore to obtain cost estimates. These types of investments are not included in these current statistics.

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#### Tables

[Table 1 Environmental protection investment in pollution treatment equipment \(end-of-pipe\) in Manufacturing, Mining and Quarrying. 2000](#)

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**Table 2 Environmental protection investment in pollution treatment equipment (end-of-pipe) in Manufacturing, Mining and Quarrying, 2000**

Industry division (SIC 94)	Number of Local kind of activity units	Investment in pollution treatment equipment (end-of-pipe). 1000 NOK						Gross investment (Acquisitions less disposals of fixed assets)	End of pipe investment as percent of Gross investment	Total acquisitions	Investment in pollution treatment equipment (end-of-pipe) as percent of total acquisitions	Production Value
		Air/climate	Wastewater	Solid waste	Noise	Other	Total					
<b>10, 12-37 MANUFACTURING, MINING AND QUARRYING</b>	<b>11 760</b>	<b>278 174</b>	<b>117 436</b>	<b>87 495</b>	<b>20 141</b>	<b>290 536</b>	<b>793 788</b>	<b>15 527 887</b>	<b>5.1</b>	<b>19 563 776</b>	<b>4.1</b>	<b>496 493 770</b>
<b>NACE C, 10, 12-14 MINING AND QUARRYING</b>	<b>360</b>	<b>10 648</b>	<b>100</b>	<b>3</b>	<b>574</b>	<b>398</b>	<b>11 723</b>	<b>546 264</b>	<b>2.1</b>	<b>645 699</b>	<b>1.8</b>	<b>6 166 096</b>
10 Coal and peat	10	-	-	-	-	-	-	201 392	0.0	226 181	0.0	233 394
13 Metal ores	5	-	-	-	-	-	-	29 117	0.0	31 835	0.0	543 131
14 Other mining and quarrying	345	10 648	100	3	574	398	11 723	315 755	3.7	387 683	3.0	5 389 571
<b>NACE D, 15-37 INDUSTRY</b>	<b>11 400</b>	<b>267 526</b>	<b>117 336</b>	<b>87 492</b>	<b>19 567</b>	<b>290 138</b>	<b>782 065</b>	<b>14 981 623</b>	<b>5.2</b>	<b>18 918 077</b>	<b>4.1</b>	<b>490 327 674</b>
15-16 FOOD PRODUCTS; BEVERAGES AND TOBACCO	1 656	15 409	13 209	7 392	1 283	8 469	45 762	3 814 584	1.2	5 024 644	0.9	116 494 663
15.1 Meat and meat products	243	8 129	825	550	40	6 271	15 815	663 977	2.4	700 425	2.3	29 357 581
15.2 Fish and fish products	523	2 047	5 830	4 862	1 156	1 654	15 549	1 003 707	1.5	1 159 363	1.3	24 262 680
15.5 Dairy products	81	489	1 408	668	-	182	2 747	349 372	0.8	475 586	0.6	13 039 779
15.3-4/6-8 Other food products	760	4 744	4 946	1 132	57	300	11 179	661 679	1.4	975 596	1.0	22 034 107
15.9/16 Beverages and tobacco	49	-	200	180	30	62	472	632 000	0.1	913 371	0.1	11 302 819
17-19 TEXTILES AND TEXTILE PRODUCTS, LEATHER AND LEATHER PRODUCTS	495	309	683	87	53	322	1 454	78 118	1.9	164 290	0.9	5 710 127
17 Textiles	329	279	663	77	33	312	1 364	55 670	2.5	138 484	1.0	4 042 799
18 Wearing apparel, dressing and dyeing of fur	131	30	20	10	20	10	90	19 060	0.5	22 080	0.4	1 157 525
19 Leather and leather products	35	-	-	-	-	-	-	3 388	0.0	3 726	0.0	509 803
20 WOOD AND WOOD PRODUCTS	999	1 287	651	900	846	2 702	6 386	320 681	2.0	841 275	0.8	17 845 960
21 PULP, PAPER AND PAPER PRODUCTS	98	15 748	12 969	1 539	3 352	185 257	218 865	908 767	24.1	1 001 999	21.8	20 341 685
21.1 Pulp, paper and paperboard	30	15 734	12 566	1 034	2 692	185 257	217 283	754 900	28.8	804 214	27.0	15 931 611

**Table 2 Environmental protection investment in pollution treatment equipment (end-of-pipe) in Manufacturing, Mining and Quarrying, 2000**

Industry division (SIC 94)	Number of Local kind of activity units	Investment in pollution treatment equipment (end-of-pipe). 1000 NOK						Gross investment (Acquisitions less disposals of fixed assets)	End of pipe investment as percent of Gross investment	Total acquisitions	Investment in pollution treatment equipment (end-of-pipe) as percent of total acquisitions	Production Value
		Air/climate	Wastewater	Solid waste	Noise	Other	Total					
21.2 Articles of paper and paperboard	68	14	403	505	660	-	1 582	153 867	1.0	197 785	0.8	4 410 074
22 PUBLISHING AND PRINTING ETC.	1 923	2 740	1 182	2 762	42	391	7 117	1 071 952	0.7	1 530 426	0.5	34 891 054
23-24 PETROLEUM PRODUCTS AND CHEMICAL PRODUCTS	200	18 636	33 052	12 834	3 314	20 385	88 221	2 395 515	3.7	2 491 236	3.5	72 101 144
23-24.1 Refined petroleum products and basic chemicals	92	5 012	25 028	12 057	3 214	18 674	63 985	1 748 915	3.7	1 799 411	3.6	58 135 656
24.3 Paints, varnishes and similar coatings, printing ink and mastics	27	9 809	1 254	214	-	1 711	12 988	646 600	3.7	691 825	3.5	13 965 488
24.4 Pharmaceuticals, medicinal chemicals and botanical products	26	1 570	6 300	223	40	-	8 133	59 261	21.9	66 550	19.5	2 192 880
24.5 Soap and Detergents, cleaning and polishing preparations, perfumes and toilet preparations	28	1 752	-	-	-	-	1 752	490 312	1.7	491 077	1.7	8 720 695
24.6 Other chemical products	27	493	470	340	60	-	1 363	13 952	12.6	33 705	5.2	1 500 622
25 RUBBER AND PLASTIC PRODUCTS	356	1 277	250	1 086	1 204	1 804	5 621	83 075	1.6	100 493	1.4	1 551 291
26 OTHER NON-METALLIC MINERAL PRODUCTS	602	5 292	1 723	8 596	1 346	1 620	18 577	416 565	1.3	580 583	1.0	7 655 555
27 BASIC METALS	132	173 932	45 055	42 679	2 915	65 629	330 216	797 709	2.3	915 315	2.0	13 920 358
28 METAL PRODUCTS, EXCEPT MACHINERY AND EQUIPMENT	1 250	9 142	470	359	928	894	11 793	1 603 081	20.6	1 804 136	18.3	48 233 102
29 MACHINERY AND EQUIPMENT N.E.C	1 268	1 192	310	133	330	1 063	3 028	487 793	2.4	637 243	1.9	20 032 473
30-33 ELECTRICAL AND OPTICAL	779	625	3 218	2 607	254	7	6 711	770 003	0.4	971 427	0.3	30 009 725

**Table 2 Environmental protection investment in pollution treatment equipment (end-of-pipe) in Manufacturing, Mining and Quarrying, 2000**

Industry division (SIC 94)	Number of Local kind of activity units	Investment in pollution treatment equipment (end-of-pipe). 1000 NOK							Gross investment (Acquisitions less disposals of fixed assets) 1000 kroner	End of pipe investment as percent of Gross investment Per cent	Total acquisitions 1000 kroner	Investment in pollution treatment equipment (end-of-pipe) as percent of total acquisitions Per cent	Production Value 1000 kroner
		Air/climate	Wastewater	Solid waste	Noise	Other	Total						
EQUIPMENT													
30 Office machinery and computers	16	-	-	-	-	-	-	956 391	0.7	1 199 340	0.6	34 074 080	
31 Electrical machinery and apparatus n.e.c.	359	625	3 035	1 548	239	-	-	12 569	0.0	15 618	0.0	1 379 926	
32 Radio, television, communication equipment	79	-	183	1 050	3	7	1 243	371 358	1.5	489 636	1.1	11 993 411	
33 Medical, precision and optical instruments	325	-	-	9	12	-	21	378 667 193 797	0.3 0.0	477 640 216 446	0.3 0.0	11 422 803 9 277 940	
34-35 (-35.114/5) TRANSPORT EQUIPMENT	681	1 335	706	1 648	1 958	729	6 376						
34 Motor vehicles, trailers and semi- trailers	118	519	45	302	1 505	373	2 744	561 424	1.1	679 280	0.9	27 718 709	
35 (-35.114/5) Other transport equipment	563	816	661	1 346	453	356	3 632	321 577 239 847	0.9 1.5	377 513 301 767	0.7 1.2	6 505 340 21 213 369	
35.114/5 OIL PLATFORMS	105	1 809	4	56	729	40	2 638	195 662	1.3	368 458	0.7	25 894 745	
36-37 MANUFACTURING N.E.C.	856	18 793	3 854	4 814	1 013	826	29 300						
36 Furniture and manufacturing n.e.c.	748	2 241	474	2 724	463	756	6 658	603 378	4.9	708 425	4.1	15 404 294	
37 Recycling	108	16 552	3 380	2 090	550	70	22 642	466 832	1.4	567 041	1.2	12 494 894	

## 2.3 2001 Data collection methodology for NACE 10, 12-37

The 2001 data collection methodology is very similar to that used in 2000, i.e. a question regarding end-of-pipe investment was included in the standard industry survey. The only major change was the inclusion of 6 environmental domains (instead of 5). The six environmental domains are: air/climate, wastewater, waste, soil and groundwater, biodiversity and landscape, and other.

The change in the environmental domains was based on a national interest and focus on biodiversity and the change in the proposal to the SBS regulation that made pilot variables out of the categories soil and groundwater and biodiversity and landscape and that the SBS regulation no longer had noise as a separate domain. By making this change the data collection became more in line with the SBS regulation and national interests.

### 2.3.1 General information regarding the 2001 survey of the manufacturing, mining and quarrying industries

The coverage, data sources and data collection approach are the same as in the previous year (see section 2.1). The following table provides specific information regarding the manufacturing, mining and quarrying survey for 2001.

**Table 3 Local kind-of-activity units (Local KAUs). Manufacturing Statistics. 2001**

	Number of local KAUs	Production value in bill. NOK	Employment
Population	11 161	508.4	276 489
Sample	4 689	468.1	240 920
Small local KAUs	6 472	40.2	35 569

In 2001, the population consisted of 11 161 local kind-of-activity units (LKAUs) classified in manufacturing, mining and quarrying, and the tables are produced based on data from these local KAU. The local KAUs in the population from which Statistics Norway has collected data, make up the net sample and came to 4689 in 2001. These 4 689 local KAUs made up 92.1 per cent of total production value and 87.1 per cent of total employment in manufacturing, mining and quarrying.

### 2.3.2 Environmental protection investment (end-of-pipe) in the 2001 industry survey

Of the 4 689 local KAUs that were included in the sample, 373 reported at least one type of investment in equipment and plant for pollution control (end-of-pipe), or 8.0 per cent. This compares with 11.2 per cent that reported end-of-pipe investment in 2000.

Again the same controlling and editing procedures were used as in the previous survey, i.e. the total of end-of-pipe investment was less than the total for all investment acquisitions.

The following figure shows how the question was included in the questionnaire (see Appendix 6.1.2 for a copy of the whole questionnaire). End-of-pipe investment was requested broken down by the following 6 environmental domains: air/climate, wastewater, waste, soil and groundwater, biodiversity and landscape, and other.

**Figure 2 Section of the 2001 standard industry questionnaire where end-of-pipe investment is requested**

**Investeringer til miljøverntiltak i utslipps- og renseutstyr i løpet av året (i 1000 kr, ikke beholdningsverdier)**

597 Investeringer i anlegg og utstyr for rensing og utslippsreduksjon (Prosessekstern, også kalt end-of-pipe. Post 597 skal være en del av post 590 Anskaffelser over)	Luft/klima	Produksjonsvann og avløp	Avfall
	Jord og grunnvann	Biolog. mangfold og landskap	Annet

**English translation:**

**Investments in environmental protection measures in emissions and treatment equipment during the year**  
(in 1000 kroner, not value of stocks)

597 Investments in plant and equipment for treatment and emissions reduction (External to production processes, also called end-of-pipe. Post 597 must be a part of post 590 Gross investment above)	Air/climate	Cooling water and Wastewater	Waste
	Soil and ground water	Biodiversity and landscape	Other

## 2.4 Publication of the 2001 NACE 10, 12-37 statistics on Statistics Norway's website

The following is the article and statistics table that was published on the Statistics Norway website for the 2001 pollution control (end-of-pipe) investment in the manufacturing, mining and quarrying industries, NACE 10, 12-37.

The table shows the most detailed level for publishing these figures. Most of the data is available at the 2-digit or division level and for NACE 15, 21 and parts of 24 the data are available at the 3-digit or group level. There are some problems with confidentiality due to the small number of establishments in some NACE groups. Currently in Norway there are only 2 refineries and so it is not possible to publish separate data for NACE 23. These data are published together with NACE 24.1 in the following table. There are no establishments (LKAUs) in NACE 24.2 Pesticides and other agro-chemical products or in NACE 24.7 Man-made fibers listed in the business register in Norway. For this reason these NACE groups have also been excluded from the tables.

## Reduced investment in environmental protection

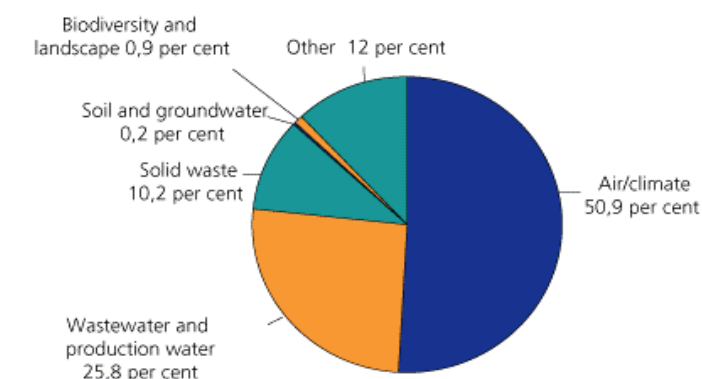
*Manufacturing, mining and quarrying industries invested NOK 586 million in end-of-pipe environmental protection in 2001. 51 per cent of the investments in environmental protection measures were directed towards reducing air emissions. Basic metals industry invested the most in environmental protection both in 2000 and 2001.*

The investment level was 26 per cent lower than in 2000, while the industries' total investments rose by 8 per cent.

Manufacturing, mining and quarrying industries invested a total of NOK 586 million in equipment that reduces pollutant emissions, also called "end-of-pipe" investments or external process investments. This equals 3.5 per cent of the industries' total investments. This type of equipment is external to the production process and treats, prevents, controls or measures pollution.

The investments are classified according to environmental domains: air/climate, wastewater – including production water– waste, soil and groundwater, biodiversity and landscape, and other. 51 per cent of the environmental protection investments were made to reduce air emissions. The corresponding values for wastewater and waste were 26 and 10 per cent, respectively.

**Investment in environmental protection measures (equipment for emission reduction and pollution treatment), divided according to environmental domains. 2001. Manufacturing and mining and quarrying. Per cent.**



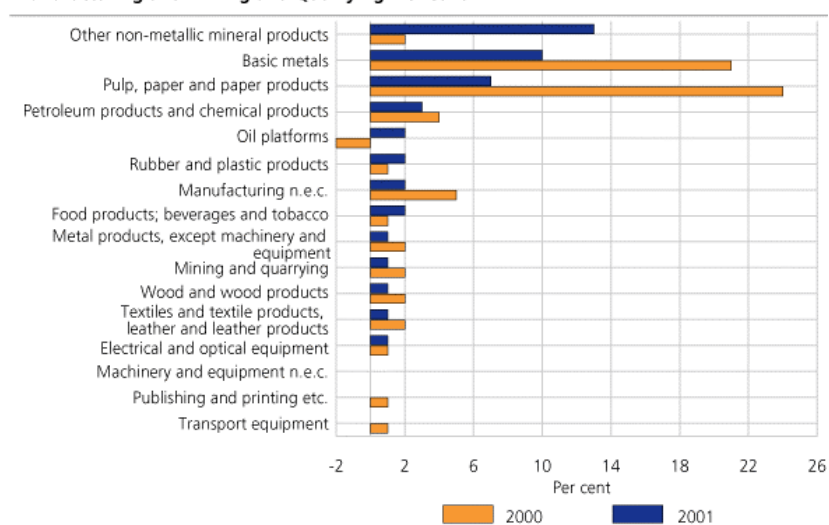
2003 © Statistics Norway

## Basic metal industry invested the most in environmental protection

The basic metals industry invested the most in environmental protection, while the mineral products industry invested the most in terms of per cent of the gross investments. More than 10 per cent, or NOK 284 million, were invested by the basic metals industry in environmental protection measures. The corresponding values in the mineral products industry were 13 per cent, or NOK 68 million.

In the production of food and beverages, petroleum and chemical products, and in the pulp and paper industry, important investments were especially focused on wastewater and protection of air/climate. Major changes in investment levels from one year to the next may often be due to specific investments made by large enterprises. In most cases, however, this kind of investment account for only about 1-2 per cent of an industry's gross investment.

**Investment in environmental protection measures (equipment for emission reduction and pollution treatment), as a percent of the specific industry's gross investment. 2001. Manufacturing and Mining and Quarrying. Per cent**



2003 © Statistics Norway

### Newly established statistics

Please note that these statistics do not include all kinds of environmental protection investments in the manufacturing and the mining and quarrying industries. Investments in new or modified production processes where environmental protection equipment are integrated into the main production processes are not included. These figures will be published for 2002. This is the second year that companies report environmental protection investments as part of the annual industry survey. For the year 2001, the companies have to a larger extent divided the investments according to specific environmental domain instead of grouping them in the category "other". At the same time, some large investments are difficult to divide according to specific environmental focus.

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### Tables

- [Table 1 Environmental protection investment in pollution treatment equipment \(end-of-pipe\) in Manufacturing, Mining and Quarrying. 2000 and 2001](#)

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**Table 4 Environmental protection investment in pollution treatment equipment (end-of-pipe) in Manufacturing, Mining and Quarrying, 2001**

Industry division (SIC 94)	Number of Local kind of activity units	Investment in pollution treatment equipment (end-of-pipe). 1 000 NOK										Gross investment (Acquisition less disposals of fixed assets)	End of pipe investment as percent of Gross investment	Total acquisitions	Investment in pollution treatment equipment (end-of-pipe) as percent of total acquisitions	Production Value
		Biodiversity and landscape					Other									
		Air/climate	Wastewater	Solid waste	Soil and groundwater	Total										
10, 12-37 MANUFACTURING, MINING AND QUARRYING	11 161	298 282	151 147	59 670	1 442	5 336	70 108	585 985	16 526 320	3,5	19 670 297	3,0	1 000 NOK	1 000 NOK	508 640 151	
NACE C, 10, 12-14 MINING AND QUARRYING	359	1 425	1 216	374	51	2	2 683	5 751	536 690	1,1	887 838	0,6			7 096 921	
10 Coal and peat	7	-	-	373	-	-	2 363	2 736	151 319	1,8	347 335	0,8			596 356	
13 Metal ores	5	-	566	-	-	-	-	566	26 159	2,2	27 744	2,0			659 960	
14 Other mining and quarrying	347	1 425	650	1	51	2	320	2 449	359 212	0,7	512 759	0,5			5 840 605	
NACE D, 15-37 INDUSTRY	10 801	296 837	149 911	59 276	1 391	5 334	67 425	580 174	15 977 017	3,6	18 769 846	3,1			501 483 314	
15-16 FOOD PRODUCTS; BEVERAGES AND TOBACCO	1 561	12 621	46 512	3 910	64	37	1 450	64 594	4 236 671	1,5	5 435 193	1,2			123 721 969	
15.1 Meat and meat products	229	1 352	3 758	1 668	10	28	-	6 816	622 167	1,1	750 750	0,9			34 104 797	
15.2 Fish and fish products	483	3 342	12 907	1 604	-	-	1 050	18 903	1 378 221	1,4	1 565 833	1,2			25 543 713	
15.5 Dairy products	76	5 591	2 442	262	-	-	-	8 295	364 860	2,3	517 647	1,6			13 014 380	
15.3-4/6-8 Other food products	730	2 336	27 395	326	54	9	400	30 520	1 367 087	2,2	1 499 508	2,0			32 139 450	
15.9/16 Beverages and tobacco	43	-	10	50	-	-	-	60	504 336	0,0	1 101 455	0,0			18 919 629	
17-19 TEXTILES AND TEXTILE PRODUCTS, LEATHER AND LEATHER PRODUCTS	462	447	543	348	-	-	-	1 338	157 197	0,9	200 270	0,7			5 670 954	
17 Textiles	308	397	523	308	-	-	-	1 228	145 067	0,8	174 142	0,7			4 148 275	
18 Wearing apparel, dressing and dyeing of fur	121	-	20	-	-	-	-	20	9 614	0,2	21 115	0,1			1 061 402	
19 Leather and leather products	33	50	-	40	-	-	-	90	2 516	3,6	5 013	1,8			461 277	
20 WOOD AND WOOD PRODUCTS	949	2 058	1 032	918	150	112	120	4 390	509 696	0,9	578 880	0,8			18 766 870	
21 PULP, PAPER AND PAPER PRODUCTS	95	14 025	21 300	6 729	-	4 590	25	46 669	701 103	6,7	803 797	5,8			20 625 705	
21.1 Pulp, paper and paperboard	33	13 810	20 352	6 109	-	4 590	25	44 886	580 769	7,7	609 651	7,4			16 429 235	
21.2 Articles of paper and paperboard	62	215	948	620	-	-	-	1 783	120 334	1,5	194 146	0,9			4 196 470	

**Table 4 Environmental protection investment in pollution treatment equipment (end-of-pipe) in Manufacturing, Mining and Quarrying, 2001**

Industry division (SIC 94)	Number of Local kind of activity units	Investment in pollution treatment equipment (end-of-pipe). 1 000 NOK							Gross investment (Acquisition less disposals of fixed assets)	End of pipe investment as percent of Gross investment	Total acquisitions	Investment in pollution treatment equipment (end-of-pipe) as percent of total acquisitions	Production Value
		Biodiversity and landscape					Total						
		Air/climate	Wastewater	Solid waste	Soil and groundwater	Other							
22 PUBLISHING AND PRINTING ETC.	1 797	1 063	268	644	-	19	-	1 994	681 151	0.3	926 997	0.2	35 829 317
23-24 PETROLEUM PRODUCTS AND CHEMICAL PRODUCTS	191	44 712	8 677	1 241	247	450	6 753	62 080	2 412 938	2.6	2 503 484	2.5	65 296 534
23-24.1 Refined petroleum products and basic chemicals	91	42 918	7 432	423	247	450	4 320	55 790	1 742 007	3.2	1 799 111	3.1	51 103 439
24.2-24.7 Other chemical products	100	1 794	1 245	818	-	-	2 433	6 290	670 931	0.9	704 373	0.9	14 193 095
24.3 Paints, varnishes and similar coatings, printing ink and mastics	26	407	90	162	-	-	2 433	3 092	71 110	4.3	72 025	4.3	2 331 748
24.4 Pharmaceuticals, medicinal chemicals and botanical products	25	120	670	406	-	-	-	1 192	519 135	0.2	531 201	0.2	7 914 425
24.5 Soap and Detergents, cleaning and polishing preparations, perfumes and toilet preparations	23	40	-	-	-	-	-	40	34 142	0.1	35 466	0.1	2 444 691
24.6 Other chemical products	26	1 227	485	250	-	-	-	1 962	46 544	4.2	65 681	3.0	1 502 231
25 RUBBER AND PLASTIC PRODUCTS	340	196	1 128	930	-	9	1 186	3 449	163 171	2.1	265 647	1.3	7 498 889
26 OTHER NON-METALLIC MINERAL PRODUCTS	576	1 142	1 928	11 301	7	2	54 000	68 380	521 995	13.1	644 361	10.6	14 195 945
27 BASIC METALS	132	194 964	59 647	29 567	-	100	50	284 328	2 761 276	10.3	2 808 816	10.1	46 342 463
28 METAL PRODUCTS, EXCEPT MACHINERY AND EQUIPMENT	1 213	6 801	358	574	2	11	-	7 746	562 630	1.4	703 936	1.1	20 463 489
29 MACHINERY AND EQUIPMENT N.E.C	1 184	2 263	256	318	200	1	-	3 038	749 700	0.4	920 040	0.3	35 030 295

**Table 4 Environmental protection investment in pollution treatment equipment (end-of-pipe) in Manufacturing, Mining and Quarrying, 2001**

Industry division (SIC 94)	Number of Local kind of activity units	Investment in pollution treatment equipment (end-of-pipe). 1 000 NOK										Gross investment (Acquisition's less disposals of fixed assets)	End of pipe investment as percent of Gross investment	Total acquisitions	Investment in pollution treatment equipment (end-of-pipe) as percent of total acquisitions	Production Value	
		Soil and water					Biodiversity and landscape										Total
		Air/climate	Wastewater	Solid waste	groundwater	Other											
30-33 ELECTRICAL AND OPTICAL EQUIPMENT 30 Office machinery and computers 31 Electrical machinery and apparatus n.e.c. 32 Radio, television, communication equipment 33 Medical, precision and optical instruments	720 14	3 595	924	229	-	-	-	-	-	-	4 748	874 861	0.5	1 046 390	0.5	34 912 336	
		-	-	-	-	-	-	-	-	-	-	23 738	0.0	24 190	0.0	1 229 629	
	328	2 704	646	27	-	-	-	-	-	-	3 377	384 408	0.9	447 524	0.8	12 049 656	
	81	290	278	200	-	-	-	-	-	-	768	327 608	0.2	336 063	0.2	11 503 545	
	297	601	-	2	-	-	-	-	-	-	603	139 107	0.4	238 613	0.3	10 129 506	
	659	8 409	5 642	1 133	1	2	-	-	-	-	15 187	673 696	2.3	749 714	2.0	32 872 353	
	120	3 195	2 900	650	1	-	-	-	-	-	6 746	306 355	2.2	339 855	2.0	6 798 460	
	539	5 214	2 742	483	-	2	-	-	-	-	8 441	367 341	2.3	409 859	2.1	26 073 893	
	114	68	-	50	-	-	-	-	-	-	118	339 507	0.0	451 541	0.0	26 369 018	
	36-37 MANUFACTURING N.E.C. 36 Furniture and manufacturing n.e.c. 37 Recycling	808 714 94	4 473 3 173 1 300	1 696 1 696 -	1 384 584 800	720 120 600	1 1 600	3 841 450 3 391	-	-	12 115 6 024 6 091	631 425 374 299 257 126	1.9 1.6 2.4	730 780 453 063 277 717	1.7 1.3 2.2	13 887 177 12 049 530 1 837 647	

## 2.5 2002 Data collection methodology for NACE 10, 12-37

In 2002 a different data collection approach was taken. Since all three variables were to be included in the survey it was decided that a separate questionnaire would be used rather than expanding the standard industry questionnaire which was the approach taken in the earlier surveys. It was also decided that a sample survey would be conducted instead of a census.

### 2.5.1 Development of the questionnaire

A good deal of time and effort was put into developing the questionnaire and the questions and instructions for collecting these new environmental protection expenditure variables. Previous work related to these variables included a pilot study conducted in 1997 (Hass, Solberg and Bersvendsen 2000) and methodology work specifically focused on the questionnaire that was completed in 2001 (Hass and Smith, 2002). Based on this earlier work certain problems were still remaining to be solved before a final version of the survey instrument could be made.

The following issues needed to be addressed: respondents not filling out the question (non-response), phrasing of the questions, placement of the explanation/ examples with respect to the question (questionnaire layout) and deciding which values could be requested as estimates and which figures needed to be requested as exact values.

The problem of non-response was especially relevant since from previous experience there were always areas left blank on the questionnaire. Did these blanks mean the enterprise did not fill-in the information, or did they not have that kind of expense so the answer is actually zero (null) or was it not possible for them to report this information for some reason. When these problems were discussed with the questionnaire and methodology experts at Statistics Norway, a new layout and approach to asking the questions was suggested. Instead of a questionnaire that looked like the standard industry questionnaire with only numbers to fill in, it was suggested that we ask for the information with check-off boxes that would have give the option for answers of "yes," "no," or "don't know."

An example of how the questions looked is provided in the figure below (see appendix for a copy of the complete questionnaire).

**Figure 3 Example of question for current expenditures and investment in end-of-pipe equipment in questionnaire for 2002**

**1** Hadde bedriften driftsutgifter knyttet til **avløp og produksjonsvann** i 2002?  
*For eksempel: avløpsgebyrer, drift og vedlikehold av oppsamlingstanker, forbehandling av avløp eller produksjonsvann, overvåkings- og analyseutgifter, bruk av filtermedia, utgifter relatert til utslippstillatelser.*

☐ Ja →  1 000 kr. eks. MVA  
☐ Nei  
☐ Vet ikke  
 ↓  
 Gå til **2**

Hvor stor andel av dette var kjøpt fra andre aktører (inkl. gebyrer)? Gi et estimat. →  Prosent

#### English translation:

**1** Did the establishment have current costs connected to wastewater and cooling water in 2002?  
*For example: wastewater treatment fees, running and maintenance of storage tanks, pretreatment of wastewater or cooling water, monitoring and analysis expenses, use of filter media, costs related to emission permits*

☐ Yes →  1 000 kr. excl. VAT  
☐ No  
☐ Don't know  
 ↓  
 Go to **2**

How large a portion of this was purchased from others (include fees paid)? Give an estimate. →  Per cent

The question is posed to the establishment in the following way: "Did the establishment have current costs connected to wastewater and cooling water in 2002?" Directly under the question is given examples of what kind of costs might have included, "For example: wastewater treatment fees, running and maintenance of storage tanks, pretreatment of wastewater or cooling water, monitoring and analysis expenses, use of filter media, costs related to emission permits." There are then three boxes that can be checked off. The first box is "yes" with an arrow pointing to the right which then asks for the amount excluding the VAT in 1000 kr. The other two boxes are "no" or "don't know" with an arrow pointing down and to the number of the next question that should be answered.

If the question is answered "yes" and an amount is reported, a follow-up question is asked regarding the amount of the reported figure that is purchased from others. An estimate (as a per cent) of the amount reported that is purchased from others is requested. Please note that this information will be used to report to the joint questionnaire of OECD/Eurostat for environmental protection expenditures and revenues (differentiating between own production and services purchased from others) and is *not* part of the required reporting to the SBS regulation and is therefore not included in this report.

By providing answering possibilities "no" or "don't know" means that the information has been evaluated by the person answering the questionnaire and it can be determined that an answer has been given to that specific question. This helps to reduce the problem of non-response to a specific question and provides an easier approach to controlling and editing. Especially for establishments that rent their locations, it is often impossible for them to know the amount of their rent that covers services for wastewater and waste treatment. It is therefore, important to have the check-off box "don't know" in order to identify these types of situations.

This approach to asking for information was used for current expenditures and end-of-pipe investments. A different approach was used for requesting integrated technology investments. For this variable a short description of the investment was requested, then the total investment amount and an estimate of the per cent associated with environmental protection was requested. After that the six environmental domains were listed and they were requested to check-off the one, major environmental domain to which the investment focused.

An example of the questions for integrated investment is provided in the figure below with an English translation following.

**Figure 4** Example of question for investment in integrated technologies in separate survey instrument for 2002

			Hovedmiljøformål (sett bare ett kryss)					
Beskrivelse av de prosessinterne investeringene	Total investeringsutgift (1000 kr, eks. MVA)	Prosent tilknyttet miljøvern	Avløp/ vann	Avfall	Luft/ klima	Jord/ grunn- vann	Biologisk mangfold/ landskap	Annet
15			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

English translation:

Description of the integrated technology investments	Total investment amount (1000 kr, excl. VAT)	Per cent for environmental protection	Main environmental domain (cross off only one)					
			Waste-water / cooling water	Waste	Air / climate	Soil and ground water	Bio-diversity/ landscape	Other
15.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The amount reported for integrated investment is then calculated by taking the per cent of the total investment amount provided. By asking for the information in this way, we are allowing the respondents to give an estimate of this type of investment rather than an exact figure. It was felt that this is one way of indicating to the respondents that these values are less precise (estimates are expected) than current expenditure and end-of-pipe investment that was to be reported in the earlier parts of the questionnaire.

When deciding how the integrated technologies should be included in the questionnaire, it was determined that the total investment amount should be information that is available to the establishment. The questionnaire methodology experts at Statistics Norway emphasized the importance of asking for existing information that is readily available to the respondents before asking for information that involves estimation. Exactly how much of that total investment amount is connected to environmental protection is the part that must be evaluated and estimated by the respondent. Using this logic it was decided to ask for the total investment amount as an exact figure and then to ask for an estimate of the amount of that investment that was connected to environmental protection.

In addition we wanted to obtain a description of the investment that is being reported. It would then be possible to evaluate if the investment should be included as part of environmental protection investment. In this way we are expecting to be able to exclude some investment that may be reported that is connected with energy savings, safety and health that are actually not to be included as environmental investment according to the variable definitions.

On the first page of each questionnaire the name and other establishment specific information (address, NACE, etc.) is preprinted. The questionnaire itself is set up in such a way that it can be optically read (scanned) in order to register the information provided by the respondents into the databases. See appendix for a complete version of the questionnaire.

### **2.5.2 2002 Data collection methodology**

The 2002 data collection methodology was different for environmental protection expenditure than those used for end-of-pipe investment in 2000 and 2001. The 2002 survey was a sample survey which is described in more detail below but first a brief description of the general industry survey is provided.

#### ***General industry survey***

The manufacturing industry survey used the same coverage, data sources and data collection as in the previous year (see section 2.1). The following table provides some basic information regarding the coverage of the manufacturing, mining and quarrying survey for the 2002 survey.

**Table 5 Local kind-of-activity units (Local KAUs). Manufacturing Statistics. 2002**

	Number of local KAUs	Production value in bill. NOK	Employment
Population	11 134	498.3	272 884
Sample	3 915	451.0	234 511
Small local KAUs	7 219	47.3	38 373

In 2002, the population consisted of 11 134 local KAUs classified in manufacturing, mining and quarrying, and the tables are produced based on data from these local KAU. The local KAUs in the population from which Statistics Norway has collected data, make up the net sample and came to 3915 in 2001. These 3 915 local KAUs made up 90.5 per cent of total production value and 85.9 per cent of total employment in manufacturing, mining and quarrying.

### ***Environmental protection expenditure survey***

The environmental protection investment and current expenditure survey was conducted as a sample survey in 2002. The sample survey was a subset of the main industry survey. The separate questionnaire was included together with the other questionnaires that were a part of the manufacturing mining and quarrying 2002 survey. The establishments that were included in the sample were sent all of the surveys that were needed to be reported that year in one mailing from Statistics Norway. This mailing was sent to the individual listed as being responsible for the enterprise (or establishment) in the business register. It was then necessary for the individual in each enterprise or establishment to forward the different questionnaires to the specific person(s) who had the responsibility and knowledge for responding to the various questionnaires.

For the Environmental protection expenditure survey, the sample was chosen according to the following criteria:

1. The enterprise (or establishment) was included in the general industry survey for 2002.
2. All enterprises with at least one establishment with 200 employees at the time the sample was drawn were automatically included.
3. The rest of the sample was selected as a stratified sample where the stratification was at the 3-digit NACE level with a higher probability of being included in the sample if that NACE group had a high reporting frequency of end-of-pipe investment in the 2001 census survey.

Although the SBS directive 58/97 as amended states that the entity to be included in the survey is at the enterprise-level, since industry statistics is surveyed at the establishment level it was decided to develop the environmental variables at the establishment level. There were many advantages for doing this since the controlling and editing procedures, databases and other systems that are set up for implementing the other parts of the SBS directive 58/97 can be simply be expanded to include these new variables. In the future we would like to be able to connect emissions data together with the expenditure data. Air emissions and water emissions data are collected at the establishment level so it is important that the units of analysis be consistent throughout all of these statistics.

The total number in the sample was 592 enterprises which included 1173 establishments/LKAUs. The number of the enterprises responding was 540 enterprises which included 1030 establishments/LKAUs. This is a response rate of 91.2 per cent at the enterprise level and 87.7 per cent at the establishment/LKAU level. Since it was obligatory to respond to the survey a high response rate is expected since there can be a fine imposed for not returning the questionnaire. Of the 1030 establishments returning the questionnaire, 990 reported figures.

These 990 establishments included 49 per cent of total production value, 37 per cent of total employment and 59 per cent of total gross investments in manufacturing, mining and quarrying in 2002.

Control and editing were conducted by the Division for Energy and industrial production statistics. Since all of the establishments included in the environmental protection expenditure sample survey were also covered by the industrial production survey, environmental investment and current expenditure totals could be compared with the totals reported for gross investments and for current expenditures (defined as: costs of goods and services consumed and compensation of employees). In this way it was possible to check for values that would be unreasonable when taken into the context of the establishments' general level of investment and current expenditure. In this way decimal errors could be particularly identified and since the values were requested in 1000 NOK a number of decimal errors were identified in this way (i.e. figures reported were in NOK and not 1000 NOK). These types of decimal errors are very important to identify and correct since they greatly influence the values. This also allowed for a basic check of consistency between the statistics developed using the industrial production questionnaire and those developed using the environmental protection expenditure questionnaire. This consistency is also an important factor when developing the survey and the statistics.

Although the 2002 survey has been a sample survey rather than a census, it has been decided to not gross up the values at this time. It was determined that further work and experience with this survey data are needed before a reliable grossing methodology can be established. From experience the values reported in a survey conducted for the first year are not the most reliable. Typically data quality improves as respondents become accustomed to reporting the requested data. The respondents often need to set up or change some of their accounting systems in order to be able to provide the requested information regarding environmental protection expenditure.

As the survey becomes more established, relationships between the variables that need to be grossed up and the standard variables that are available (such as gross investment, employment and turnover) need to be investigated. Some preliminary work has been done using the pilot survey data from 1997 (Hass, et al. 2000). From this work no variables were clearly identified as reliable for grossing up the variables. Grossing up investment is particularly difficult and the uncertainty is high. Further discussion regarding grossing up is provided after the presentation of the statistics.

## **2.6 Publication of the 2002 NACE 10, 12-37 statistics on Statistics Norway's website**

Again, most of the data is available at the 2-digit or division level and for NACE 15, 21 and parts of 24 the data are available at the 3-digit or group level. As mentioned before, there are some problems with confidentiality due to the small number of establishments in some NACE groups. Currently in Norway there are only 2 refineries and so it is not possible to publish separate data for NACE 23. These data are published together with NACE 24.1. In addition, there are no establishments (LKAUs) in NACE 24.2 Pesticides and other agro-chemical products or in NACE 24.7 Man-made fibers listed in the business register in Norway. For this reason these NACE groups have also been excluded from the following tables.

Due to the limited number of establishments included in the sample survey and that the figures have not been grossed up, the figures for the following industries cannot be provided due to confidentiality reasons:

NACE 10	Coal and peat
NACE 13	Metal ores
NACE 14	Other mining and quarrying
NACE 17	Textiles
NACE 18	Wearing apparel, dressing and dyeing of fur
NACE 24.4	Pharmaceuticals, medicinal chemicals and botanical products
NACE 24.5	Soap & detergents, cleaning & polishing preparations, perfumes & toilet preparations
NACE 30	Office machinery and computers
NACE 33	Medical, precision and optical instruments

## Large manufacturing establishments spent over NOK 2.2 billion on environmental protection

*For the first time Norwegian establishments have reported current costs related to environmental protection, and in 2002 such costs came to a total of NOK 1.3 billion for large establishments in the manufacturing, mining and quarrying industries. In the same year, these establishments invested approximately NOK 860 million in environmental protection measures, making the total costs for environmental protection over NOK 2.2 billion.*

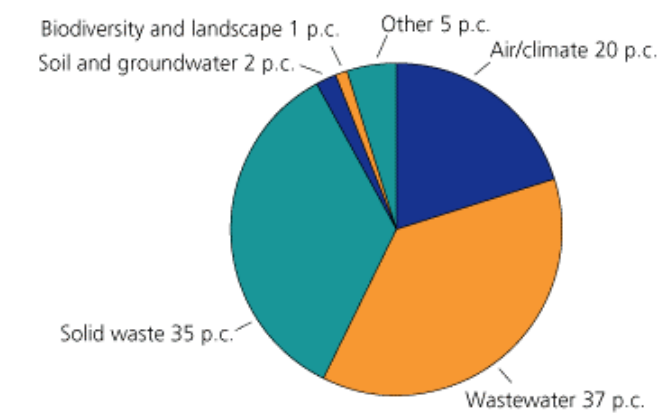
This represents 1 per cent of the costs of goods and services consumed, compensation of employees and gross investment in these establishments. The investments focused mostly on reducing air emissions while current costs were highest for wastewater and waste.

These statistics are based on information from a sample survey of 1 173 of the largest establishments classified in the manufacturing and mining and quarrying industries, where the industries with the largest expected environmental protection investments were best represented in the sample. It has been estimated that the environmental protection investments for these establishments accounted for over 70 per cent of the total environmental protection investment in the manufacturing and mining and quarrying industries. Gross investment in this sample accounted for approximately 60 per cent of total gross investment in the manufacturing, mining and quarrying industries while the current expenditures in the sample accounted for just under 55 per cent of the total.

### Current expenditures mostly for wastewater and waste

NOK 950 million or about 72 per cent of current costs for environmental protection were related to wastewater and waste. These costs included municipal fees and other wastewater and solid waste fees. At the same time, costs for reducing air emissions were NOK 265 million or approximately 20 per cent of environmental protection current costs. Costs for CO<sub>2</sub> taxes and other environmental taxes are not included.

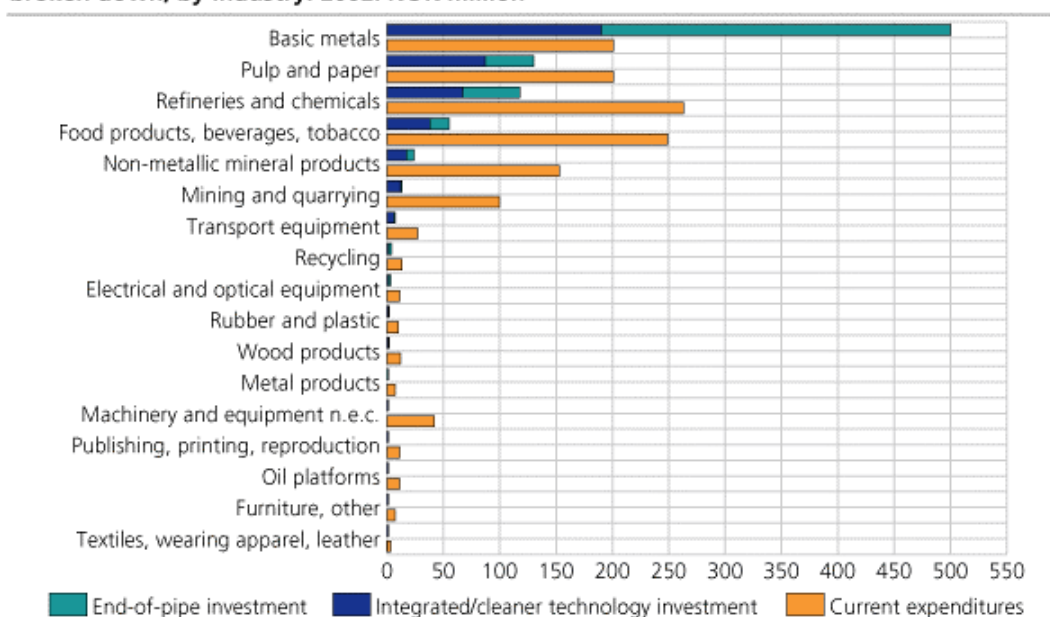
**Current costs for environmental protection broken down, by environmental domain. 2002. Per cent**



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Four industries, in particular, stand out because of their high current expenditures for environmental protection. In addition to the pulp and paper industry, oil refineries and chemical industry, and basic metals industry, the food products, beverages and tobacco industry had the highest current costs, at approximately NOK 249 million. The food products, beverages and tobacco industry consists of a large number of production units and most of them reported current costs connected to environmental protection. These costs are particularly focused in the environmental domains of waste and wastewater.

**Investments and current expenditures for environmental protection in large establishments broken down, by industry. 2002. NOK million**



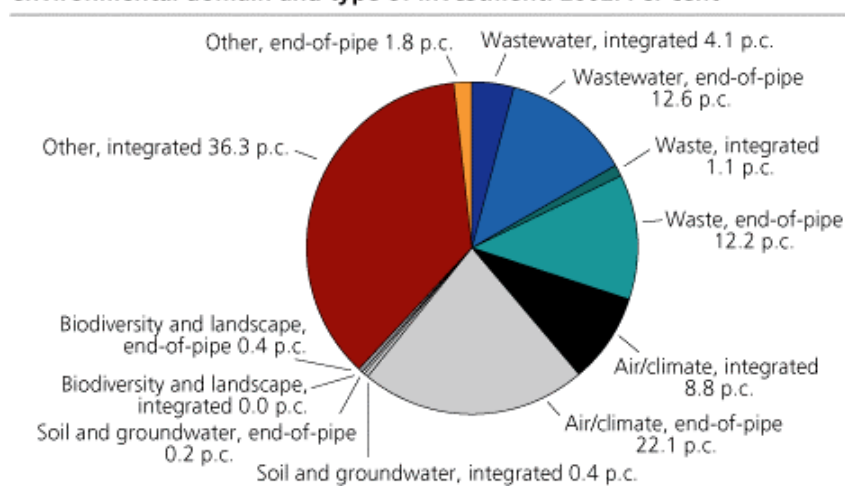
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Industries that have high current costs for environmental protection do not necessarily have high investment levels for the same environmental domain. One explanation can be that costs for wastewater and waste treatment account for a large portion of the reported current costs and these expenditures are not necessarily directly linked to the establishments own investments. This pattern is particularly observed for mining and quarrying, non-metallic mineral products, and the food products, beverages and tobacco industries.

**Most investments for air and waste measures**

So-called end-of-pipe or pollution treatment investments are an important part of environmental protection investments and Norwegian establishments reported NOK 426 million in costs related to this type of investment in 2002. Investments in measures focusing on air emissions continue to be important. These investments accounted for 45 per cent of all end-of-pipe investment while end-of-pipe investments in solid waste measures accounted for about 25 per cent.

**Environmental protection investment broken down according to environmental domain and type of investment. 2002. Per cent**



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A large proportion of integrated technology investment (72 per cent) is not specified according to environmental domain. One reason for this can be that it is often difficult for establishments to divide up a large investment according to environmental domains if more than one domain is covered by the investment. Of the integrated technology investments that have been reported according to environmental domain, just about 61 per cent of the

investment went to measures focused on air/climate emissions and 28 per cent of the investment went to treatment of wastewater/production water.

The pulp and paper industry reported NOK 43 million in integrated technology investments. And with respect to end-of-pipe investments, the pulp and paper industry also had a relatively high investment level with over NOK 87 million or 20 per cent of total reported end-of-pipe investment. All together this industry invested more than NOK 22 800 per employed person, in environmental protection measures.

The basic metals industry had the highest share of end-of-pipe investments, and used NOK 190 million. In addition, high levels were reported for integrated technology investments, which means that this industry used almost 10 per cent of its total gross investment for environmental protection purposes. This industry alone accounted for over half of total environmental protection investment in the manufacturing, mining and quarrying industries.

The basic metals industry also had a larger share of integrated technology investments than the other industries. The pulp and paper industry and the oil refineries and chemical industry also have high levels of integrated technology investments. Most industries still invest more in pollution treatment or so-called end-of-pipe solutions than in cleaner, integrated production technology.

### **More about environmental protection investments**

Environmental protection investment was reported for the accounting year 2002 according to two main categories, integrated technology and end-of-pipe technology, while only end-of-pipe investments were reported in 2001. The purpose of end-of-pipe or pollution treatment investments is to treat, control or measure pollution, whereas integrated technology investments are connected to cleaner technology within production processes and are also considered pollution prevention measures.

In connection with the reporting of integrated technology investments, the establishments have given a short description of the investment. Examples of investments that were made in 2002 include measures for waste reduction including improved production equipment that use raw materials more efficiently and thus result in less waste, and equipment for reusing cooling water. These types of investments typically result in increases in production efficiency as well as providing a positive environmental effect. It is likely that there is a certain amount of errors in the reporting of this type of investment since the portion of the investment that is specifically connected to environmental protection can be difficult to estimate. Establishments in the survey reported that they used NOK 438 million for integrated technology investments in 2002. A large portion of the integrated technology investments in 2002 was connected to large individual investments in the basic metals industry.

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#### **Tables**

- [Table 1 Environmental protection investment in large establishments in Manufacturing, Mining and Quarrying, 2002](#)
- [Table 2 Environmental expenditure in large establishments, by industry and environmental area](#)

**Table 6 Environmental protection investment in pollution treatment equipment (end-of-pipe) and integrated technology in large establishments in Manufacturing, Mining and Quarrying, 2002**

Industry division (SIC 94)	Number of Local kind of activity units	Investment in pollution treatment equipment (end-of-pipe) and integrated technology (pollution prevention). 1 000 NOK														Gross investment (Acquisitions less disposals of fixed assets)	Environ-mental protection investment as percent of total acquisitions	Environ-mental protection investment as percent of total acquisitions	Production Value		
		Air/climate		Wastewater		Solid waste		Soil and groundwater		Biodiversity and landscape		Other		Totals							
		End-of-pipe	Inte-grated	End-of-pipe	Integrated	End-of-pipe	Integrated	End-of-pipe	Integrated	End-of-pipe	Integrated	End-of-pipe	Integrated	End-of-pipe	Integrated					Total	
10, 12-37 MANUFACTURING, MINING AND QUARRYING																		1 000 NOK	Per cent	1 000 NOK	1 000 NOK
	990	190 391	75 657	109 184	35 302	105 171	9 648	2 099	3 710	3 635	180	15 235	313 164	425 715	437 660	863 375		7.8	12 403 017	7.0	242 786 902
	45	2 838	100	4 491	-	2 264	-	193	40	860	-	1 088	1 000	11 734	1 140	12 874	106 584	12.1	129 880	9.9	2 657 572
	1	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	1	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	43	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	945	187 553	75 557	104 693	35 302	102 907	9 648	1 906	3 670	2 775	180	14 147	312 164	413 981	436 520	850 501	11 029 273	7.7	12 273 137	6.9	240 129 330
	272	11 579	2 968	24 347	8 649	1 758	2 300	70	746	-	-	335	2 020	38 089	16 682	54 771	1 771 712	3.1	2 200 967	2.5	69 577 134
	67	6 883	1 300	1 041	870	960	200	-	-	-	-	10	-	8 894	2 370	11 264	487 964	2.3	527 489	2.1	26 097 903
	69	3 470	302	7 443	367	220	-	-	-	-	-	5	325	11 138	994	12 132	359 203	3.4	396 857	3.1	6 200 402
55	986	542	11 531	2 296	350	1 797	70	-	-	-	20	615	12 957	5 250	18 207	438 272	4.2	455 762	4.0	12 370 585	
54	40	-	4 332	3 326	228	303	-	746	-	-	100	-	4 700	4 375	9 075	257 002	3.5	294 668	3.1	6 856 259	
15.9/16 Beverages and tobacco	18	-	500	-	1 790	-	-	-	-	-	-	-	950	-	3 240	3 240	185 104	1.8	469 449	0.7	9 760 059
17-19 TEXTILES AND TEXTILE PRODUCTS, LEATHER AND LEATHER PRODUCTS	12	-	-	455	-	90	-	-	-	-	-	-	-	545	-	545	17 907	3.0	21 126	2.6	528 864
17 Textiles	11	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
18 Wearing apparel, dressing and dyeing of fur	1	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:

**Table 6 Environmental protection investment in pollution treatment equipment (end-of-pipe) and integrated technology in large establishments in Manufacturing, Mining and Quarrying, 2002**

Industry division (SIC 94)	Number of Local kind of activity units	Investment in pollution treatment equipment (end-of-pipe) and integrated technology (pollution prevention). 1 000 NOK															Gross investment (Acquisitions less disposals of fixed assets)	Environ-mental protection investment as percent of total acquisitions	Environ-mental protection investment as percent of total acquisitions	Production Value
		Air/climate		Wastewater		Solid waste		Soil and groundwater		Biodiversity and landscape		Other		Totals						
		End-of-pipe	Inte-grated	End-of-pipe	Integrated	End-of-pipe	Inte-grated	End-of-pipe	Inte-grated	End-of-pipe	Inte-grated	End-of-pipe	Integrated	End-of-pipe	Inte-grated	Total				
19 Leather and leather products	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 WOOD AND WOOD PRODUCTS	47	689	401	262	-	10	380	-	-	-	-	20	-	981	781	1 762	1.4	149 590	1.2	4 111 146
21 PULP, PAPER AND PAPER PRODUCTS	26	6 600	14 594	4 263	23 205	74 018	-	317	10	384	-	1 802	4 925	87 384	42 734	130 118	21.9	632 338	20.6	12 788 566
21.1 Pulp, paper and paperboard	15	6 600	14 594	4 263	23 205	73 928	-	317	10	384	-	1 802	4 925	87 294	42 734	130 028	22.8	595 690	21.8	11 176 416
21.2 Articles of paper and paperboard	11	-	-	-	-	90	-	-	-	-	-	-	-	90	-	90	0.4	36 648	0.2	1 612 150
22 PUBLISHING AND PRINTING ETC.	40	400	-	-	-	845	-	-	-	-	-	-	-	1 245	-	1 245	1.2	207 041	0.6	11 238 275
23-24 PETROLEUM PRODUCTS AND CHEMICAL PRODUCTS	58	46 301	46 479	9 391	2 090	1 315	826	1 290	374	50	-	8 490	1 556	66 837	51 325	118 162	6.7	1 783 607	6.6	43 436 280
23-24.1 Refined petroleum products and basic chemicals	42	41 191	46 329	6 281	1 865	1 189	250	1 290	374	50	-	8 440	1 556	58 441	50 374	108 815	6.6	1 668 939	6.5	39 075 070
24-2-24.7 Other chemical products	16	5 110	150	3 110	225	126	576	-	-	-	-	50	-	8 396	951	9 347	8.3	114 668	8.2	4 361 210
24.3 Paints, varnishes and similar coatings, printing ink and mastics	5	60	30	-	225	126	576	-	-	-	-	-	-	186	831	1 017	1.7	59 292	1.7	1 708 382
24.4 Pharmaceuticals, medicinal chemicals and botanical products	5	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
24.5 Soap and Detergents, cleaning and polishing preparations, perfumes and toilet preparations	2	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:

**Table 6 Environmental protection investment in pollution treatment equipment (end-of-pipe) and integrated technology in large establishments in Manufacturing, Mining and Quarrying, 2002**

Industry division (SIC 94)	Number of Local kind of activity units	Investment in pollution treatment equipment (end-of-pipe) and integrated technology (pollution prevention). 1 000 NOK															Gross investment (Acquisitions less disposals of fixed assets)	Environ- mental protection investment as percent of total acquisitions	Environ- mental protection investment as percent of total acquisitions	Production Value		
		Air/climate		Wastewater		Solid waste		Soil and groundwater		Biodiversity and landscape		Other		Totals								
		End-of-pipe	Inte- grated	End-of-pipe	Integrated	End-of-pipe	Inte- grated	End-of-pipe	Inte- grated	End-of-pipe	Inte- grated	End-of-pipe	Integrated	End-of-pipe	Inte- grated	Total						
24.6 Other chemical products	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5 927	-	6 277	-	504 907	
25 RUBBER AND PLASTIC PRODUCTS	31	540	-	404	210	100	250	-	-	-	-	155	500	1 199	960	2 159	79 051	2.7	155 425	1.4	1 692 649	
26 OTHER NON-METALLIC MINERAL PRODUCTS	157	2 264	1 833	1 464	-	13 159	4 069	59	40	10	-	130	653	17 086	6 595	23 681	221 740	10.7	416 982	5.7	7 763 080	
27 BASIC METALS	37	117 396	7 175	58 965	-	10 553	543	155	-	2 331	180	851	302 090	190 251	309 988	500 239	5 008 397	10.0	5 026 801	10.0	26 900 765	
28 METAL PRODUCTS, EXCEPT MACHINERY AND EQUIPMENT	47	120	1 020	150	-	56	-	-	-	-	-	50	-	376	1 020	1 396	89 095	1.6	109 927	1.3	3 486 568	
29 MACHINERY AND EQUIPMENT N.E.C	51	160	83	776	83	180	-	15	-	-	-	84	-	1 215	166	1 381	100 249	1.4	313 219	0.4	13 316 668	
30-33 ELECTRICAL AND OPTICAL EQUIPMENT	34	8	318	706	395	35	980	-	-	-	-	-	420	749	2 113	2 862	226 742	1.3	236 043	1.2	10 862 195	
30 Office machinery and computers	1	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
31 Electrical machinery and apparatus n.e.c.	20	8	318	706	395	15	980	-	-	-	-	-	420	729	2 113	2 842	116 183	2.4	118 006	2.4	4 522 597	
32 Radio, television, communication equipment	9	-	-	-	-	20	-	-	-	-	-	-	-	20	-	20	58 409	0.0	65 606	0.0	3 867 743	
33 Medical, precision and optical instruments	4	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
34-35 (-35.114/5) TRANSPORT EQUIPMENT	43	450	640	3 445	670	128	-	-	-	-	-	2 000	-	6 023	1 310	7 333	459 337	1.6	467 894	1.6	11 325 737	
34 Motor vehicles, trailers and semitrailers	11	450	-	870	670	-	-	-	-	-	-	-	-	1 320	670	1 990	328 887	0.6	329 429	0.6	3 489 812	



**Table 7 Current expenditures for environmental protection in large establishments in Manufacturing, Mining and Quarrying, 2002**

Industry division (SIC 94)	Number of Local kind of activity units	Current expenditures for environmental protection. 1 000 NOK						Costs of goods & services consumed + compensation of employees	Current expenditure for environmental protection as percent of costs of goods & services consumed + compensation of employees	Number of persons employed	Current expenditure for environmental protection per person employed	Production Value
		Air/climate	Wastewater	Solid waste	Soil and groundwater	Biodiversity and landscape	Other					
<b>10, 12-37 MANUFACTURING, MINING AND QUARRYING</b>	990	265 551	491 250	459 149	26 578	15 252	63 876	1 321 656	0.6	100 170	13.2	242 786 902
<i>NACE C, 10, 12-14 MINING AND QUARRYING</i>	45	50 503	26 095	18 452	285	350	4 714	100 399	4.6	1 198	83.8	2 657 572
10 Coal and peat	1	:	:	:	:	:	:	:	:	:	:	:
13 Metal ores	1	:	:	:	:	:	:	:	:	:	:	:
14 Other mining and quarrying	43	:	:	:	:	:	:	:	:	:	:	:
<i>NACE D, 15-37 INDUSTRY</i>	945	215 048	465 155	440 697	26 293	14 902	59 162	1 221 257	0.6	98 972	12.3	240 129 330
<i>15-16 FOOD PRODUCTS, BEVERAGES AND TOBACCO</i>	272	4 741	150 994	85 333	2 497	2 124	3 580	249 269	0.4	23 899	10.4	69 577 134
15.1 Meat and meat products	67	1 631	37 450	30 232	-	105	937	70 355	0.3	9 212	7.6	26 097 903
15.2 Fish and fish products	69	687	8 864	9 588	-	29	1 155	20 323	0.3	3 195	6.4	6 200 402
15.5 Dairy products	55	294	44 165	14 067	-	1 740	518	11 720 112	0.5	3 871	15.7	12 370 585
15.3-4/6-8 Other food products	54	839	29 935	18 083	2 455	-	652	51 964	0.9	3 572	14.5	6 856 259
15.9/16 Beverages and tobacco	18	290	29 764	12 594	17	-	68	42 733	0.8	3 430	12.5	9 760 059
<i>17-19 TEXTILES AND TEXTILE PRODUCTS, LEATHER AND LEATHER PRODUCTS</i>	12	162	1 132	1 126	10	-	77	2 507	0.5	579	4.3	528 864
17 Textiles	11	:	:	:	:	:	:	:	:	:	:	:
18 Wearing apparel, dressing and dyeing of fur	1	:	:	:	:	:	:	:	:	:	:	:
19 Leather and leather products	-	-	-	-	-	-	-	-	-	-	-	-
<i>20 WOOD AND WOOD PRODUCTS</i>	47	1 039	2 307	7 414	349	-	1 020	12 129	0.3	3 222	3.8	4 111 146
<i>21 PULP, PAPER AND PAPER PRODUCTS</i>	26	19 892	123 300	48 723	500	435	8 440	201 290	1.7	5 696	35.3	12 788 566
21.1 Pulp, paper and paperboard	15	19 745	120 103	44 053	500	435	8 440	193 276	1.9	4 526	42.7	11 176 416
21.2 Articles of paper and paperboard	11	147	3 197	4 670	-	-	-	8 014	0.5	1 170	6.8	1 612 150
<i>22 PUBLISHING AND PRINTING ETC.</i>	40	710	1 722	8 445	-	-	180	11 057	0.1	8 216	1.3	11 238 275
<i>23-24 PETROLEUM PRODUCTS AND CHEMICAL PRODUCTS</i>	58	54 420	108 819	66 053	16 478	143	16 838	262 751	0.6	7 977	32.9	43 436 280

**Table 7 Current expenditures for environmental protection in large establishments in Manufacturing, Mining and Quarrying, 2002**

Industry division (SIC 94)	Number of Local kind of activity units	Current expenditures for environmental protection. 1 000 NOK							Costs of goods & services consumed + compensation of employees	Current expenditure for environmental protection as percent of Costs of goods & services consumed + compensation of employees	Number of persons employed	Current expenditure for environ- mental protection per person employed	Production Value
								Total					
		Air/climate	Wastewater	Solid waste	Soil and groundwater	Biodiversity and landscape	Other						
23-24.1 Refined petroleum products and basic chemicals 24.2-24.7 Other chemical products 24.3 Paints, varnishes and similar coatings, printing ink and mastics 24.4 Pharmaceuticals, medicinal chemicals and botanical products 24.5 Soap and Detergents, cleaning and polishing preparations, perfumes and toilet preparations 24.6 Other chemical products	42	52 975	104 887	56 467	16 478	75	15 564	246 446	0.7	5 771	42.7	39 075 070	
	16	1 445	3 932	9 586	-	68	1 274	16 305	0.4	2 206	7.4	4 361 210	
	5	99	1 316	4 091	-	18	1 023	6 547	0.4	953	6.9	1 708 382	
	5	:	:	:	:	:	:	:	:	:	:	:	
	2	:	:	:	:	:	:	:	:	:	:	:	
	4	220	441	1 589	-	-	151	2 401	0.5	171	14.0	504 907	
	31	910	1 819	5 937	-	-	941	9 607	0.6	1 149	8.4	1 692 649	
	157	37 858	27 094	73 201	1 621	10 613	2 980	153 367	2.2	4 566	33.6	7 763 080	
	37	78 207	30 179	70 350	3 385	919	17 862	200 902	0.8	7 808	25.7	26 900 765	
	47	544	1 849	4 171	100	-	423	7 087	0.2	2 439	2.9	3 486 568	
28 METAL PRODUCTS, EXCEPT MACHINERY AND EQUIPMENT 29 MACHINERY AND EQUIPMENT N.E.C 30-33 ELECTRICAL AND OPTICAL EQUIPMENT 30 Office machinery and computers 31 Electrical machinery and apparatus n.e.c. 32 Radio, television, communication equipment 33 Medical, precision and optical instruments	51	12 261	1 831	25 431	923	532	1 212	42 190	0.4	5 823	7.2	13 316 668	
	34	398	2 323	6 804	35	105	1 130	10 795	0.1	5 827	1.9	10 862 195	
	1	:	:	:	:	:	:	:	:	:	:	:	
	20	307	1 851	4 834	20	15	1 130	8 157	0.2	2 458	3.3	4 522 597	
	9	76	372	1 021	15	90	-	1 574	0.0	2 092	0.8	3 867 743	
	4	:	:	:	:	:	:	:	:	:	:	:	
	43	1 996	8 066	14 824	100	-	1 973	26 959	0.3	6 493	4.2	11 325 737	
	11	1 313	6 569	5 013	100	-	1 120	14 115	0.4	2 680	5.3	3 489 812	
	32	683	1 497	9 811	-	-	853	12 844	0.2	3 813	3.4	7 835 925	
	37	858	1 065	7 714	65	-	1 391	11 093	0.1	11 640	1.0	18 497 664	
35.114/5 OIL PLATFORMS													

**Table 7 Current expenditures for environmental protection in large establishments in Manufacturing, Mining and Quarrying. 2002**

Industry division (SIC 94)	Number of Local kind of activity units	Current expenditures for environmental protection. 1 000 NOK						Costs of goods & services consumed + compensation of employees	Current expenditure for environmental protection as percent of Costs of goods & services consumed + compensation of employees	Number of persons employed	Current expenditure for environmental protection per person employed	Production Value
		Air/climate	Wastewater	Solid waste	Soil and groundwater	Biodiversity and landscape	Other					
								1 000 NOK	Per cent		Per cent	1 000 NOK
36-37 MANUFACTURING N.E.C.	53	1 052	2 655	15 171	230	31	1 115	4 185 363	0.5	3 638	5.6	4 603 739
36 Furniture and manufacturing n.e.c.	39	485	2 269	3 922	-	1	246	3 735 873	0.2	3 388	2.0	4 092 056
37 Recycling	14	567	386	11 249	230	30	869	449 490	3.0	250	53.3	511 683

## 2.7 Evaluating the 2002 statistics

Since the sample was drawn in such a way that most of the environmental protection investment was expected to be adequately covered in order to not require grossing up, it is necessary to evaluate if this actually ended up to be the case. To try to identify specific areas where there may be a need for grossing up the figures, a very rough grossing up method was used in order to evaluate what further work in this area is required.

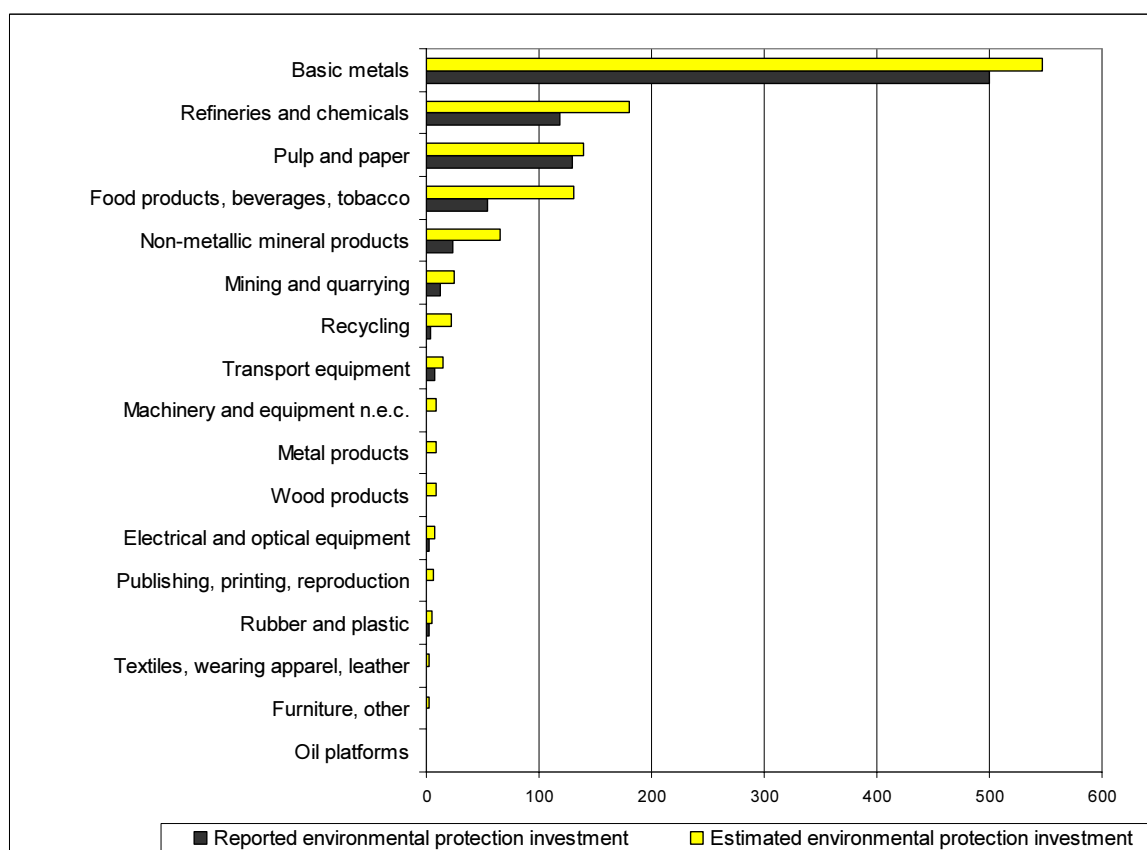
### *Environmental protection investment*

The grossing up method used for the investment figures was simply based on the gross investment figures for the population (broken down according to the NACE 2-digit level) available from manufacturing statistics. The following formula shows the method:

$$\begin{array}{ccccc} \text{Estimated investment for} & & \text{Reported environmental} & & \text{Gross investment in the} \\ \text{environmental protection for the} & = & \text{protection investment in} & * & \text{population} \\ \text{population} & & \text{the sample} & & \\ & & & & \hline & & & & \text{Gross investment in the sample} \end{array}$$

The following figure presents these results.

**Figure 5**      **Reported and estimated environmental protection investment. Billion NOK. 2002**



The industries that have high investment levels in 2002 were well represented in the sample drawn for the reporting of environmental protection investment. This resulted in an estimated 73 per cent total coverage rate for environmental protection investment. The basic metals industry had a high coverage in the sample; 92 per cent. This is also the case for the pulp and paper industries where there was 94 per cent coverage. The coverage in the NACE divisions for refineries and chemicals,

food products, beverages and tobacco, and non-metallic mineral products was not as high. The coverage in these industries was 66 per cent, 42 per cent, and 36 per cent, respectively. Although the other divisions show that the estimated investment values are larger than the reported values, these increases are relatively small in comparison since the general investment levels are so low in these divisions.

One important thing to notice here is whether the industries with high levels of gross investment that would also have investments in environmental protection investment are well covered. For the industries with high levels of investment there is very good coverage in two industries so that no grossing up is warranted. For three industries (refineries and chemicals, food products, beverages and tobacco, and non-metallic mineral products) the level of coverage is not high enough so therefore grossing up the figures appears to be indicated. It does appear that the coverage is high enough to be used as a basis for grossing up the figures, however some other factors may need to be considered, such as are the establishments included in the sample representative of the whole population. This may not be the case since the sample drawn primarily includes large establishments, so there is some question regarding how representative the sample is to the population.

Based on this evaluation, some adjustments in drawing the sample may be possible so that at least one or two of these three NACE divisions are covered more adequately. Due to the structure of NACE 15-16 Food products, beverages and tobacco, it would be very difficult to adequately increase the coverage of this industry because there are so many small establishments so that achieving better coverage would increase the size of the sample to impractical levels.

If adjustments of this type are not possible, either because of having to increase the sample too much or due to other factors, establishing a grossing up methodology for environmental protection investment should be considered.

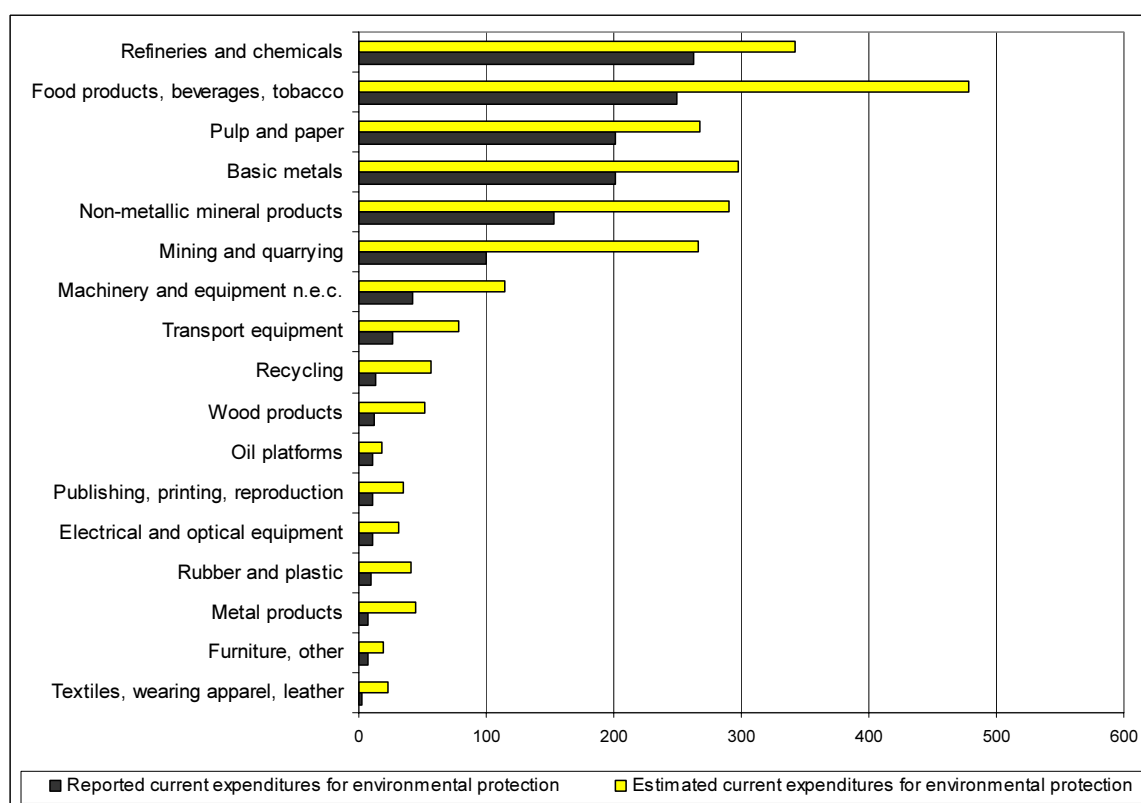
### ***Environmental protection current expenditures***

The grossing up method for current expenditures was similar to that used for investment. The variable used from manufacturing statistics was the sum of (1) costs of goods and services consumed and (2) compensation of employees. The calculation is shown below.

$$\begin{array}{lcl} \text{Estimated current expenditures for} & & \text{Costs of goods and services} \\ \text{environmental protection for the} & = & \text{consumed + compensation of} \\ \text{population} & & \text{employees in the population} \\ & & \hline & \text{Reported current} & \text{Costs of goods and services} \\ & \text{expenditures for} & \text{consumed + compensation of} \\ & \text{environmental protection} & \text{employees in the sample} \\ & \text{in the sample} & \end{array} \quad *$$

The following figure shows how well the current expenditures for environmental protection are estimated to be covered using this very simple grossing up method. If this figure is compared to the figure for investment it is very clear that the selection criteria used for defining the drawing of the sample was based on expected investments and not on expected current expenditure since the coverage rates are not as high.

**Figure 6**      **Reported and estimated current expenditures for environmental protection.**  
**Billion NOK. 2002**



The overall coverage rate for current expenditures (defined as the sum of (1) costs of goods and services consumed and (2) compensation of employees) was only 54 per cent. This figure shows that the refineries and chemicals industry and the pulp and paper industry have over 75 per cent coverage rates which are quite acceptable levels. However for the food products, beverages and tobacco industry, the non-metallic mineral products industry, and the mining and quarrying industry the coverage rates are substantially less. It appears that there is no stable relationship between investment and current expenditures so having based the criteria for drawing the sample on end-of-pipe investments in 2001, it must be concluded that this approach did not cover current expenditures particularly well in many of the industry groups.

This analysis indicates that a methodology for grossing up current expenditures for environmental protection needs to be developed. It is highly unlikely that a larger sample will be used in future surveys so efforts need to be made with regards to grossing up these current expenditure figures. The simple approach used here to evaluate the coverage for current expenditures for environmental protection shows that these figures could increase from NOK 1.3 billion to 2.5 billion. However, using a very simple grossing up methodology is not necessarily justified for all environmental domains and the sample is skewed towards larger establishments and is not necessarily representative for the population. The simple method used here to gross up assumed that the levels of expenditures in large establishments would be the same for small establishments. So the method here most likely over estimates the actual figures. For these reasons a more sophisticated grossing up methodology needs to be developed and evaluated.

With regards to current expenditures for wastewater treatment and waste treatment, we would like to investigate using the municipal rates for these services as a potential method for grossing up. By using the address and the municipal code from the business register it should be possible to identify the municipality in which the enterprises are located for the enterprises that are not included in the sample or for those that have not reported values for these two variables. We could then use the corresponding municipal rates to try to estimate current expenditure for these two

environmental domains. One problem is that Statistics Norway only has municipal rates for the services for households and not for enterprises. Currently, however, at least for wastewater services it is not allowed to charge households and enterprises different rates.

If this approach does not prove to be workable, another idea for estimating these values is to use the variable reported to the tax authorities (and is part of the data obtained from each enterprise for the standard industry production statistics) that reports the expenses for wastewater, waste, water and cleaning services (post 6395). It would be necessary to somehow estimate how much of the amount reported is for cleaning services and water and then subtract this from the reported amount and then assign a certain proportion of the amount remaining between wastewater and waste treatment services. We would like to look at the amounts reported for current expenditures for wastewater and waste and compare them to this standard accounting post that is reported to the tax authorities and perhaps use this information for both control and editing purposes and estimating purposes.

The approach used for establishing these statistics so far has been to focus primarily on large establishments and enterprises. Although a few smaller establishments are included in the sample, this is mostly because they are part of a larger enterprise that was included in the sample and so were also included in the sample. The pattern of environmental protection investment and current expenditure in large establishments and in small and medium-sized establishments is not expected to be the same. So to base a grossing up methodology solely on the reporting of large establishments would not be methodologically sound. Some evaluation of the relationships between the larger and smaller establishments in terms of environmental protection expenditure is needed in order to develop a well-grounded grossing up methodology that would be valid for the whole population. The need for developing a grossing up methodology also has implications for how the sample is drawn. For 2002 the sample was skewed towards high coverage of environmental protection investment and is not necessarily representative for all NACE divisions. These issues will need to be considered with respect to drawing the next year's sample.

Based on this simple analysis, we conclude that the criteria for drawing the sample need to be re-evaluated and potentially adjusted in light of the coverage for certain industries. Grossing up methodologies need to be developed for certain industries with regards to investment and with respect to current expenditure, there is a need to develop grossing up methodologies for nearly all NACE divisions.

## **2.8 Comparisons of the data for 2000, 2001 and 2002**

When establishing a new survey, respondents need to gain experience with regards to collecting the information that is required for filling out the questionnaire and to answering the questionnaire itself. In developing the statistics we also need to gain experience in terms of control and editing processes, calculation and estimation methodologies, and with comparing the new statistics to already established statistical areas.

When only end-of-pipe investment was requested from establishments, we thought that this reporting may include a combination of end-of-pipe investment and investment that could be considered more appropriately as integrated technology investment. We also thought that respondents would tend to report any type of environmental protection investment and not just end-of-pipe investment just to show that their establishment was making investments in environmental protection.

When comparing the data from 2001 to that of 2002 the per cent of establishments included in the survey that reported end-of-pipe investment increased from 8.0 to 18.2 per cent. But it is difficult

to compare the end-of-pipe investment amounts reported because in 2000 and 2001 a census survey was used whereas in 2002 a sample survey was used and the figures were not grossed up.

Exactly why environmental protection investment level went down between 2000 and 2001 cannot be precisely determined but there were several major investments reported in 2000 by establishments in the pulp and paper industries that were perhaps over-reported with respect to the share of the investment that should be considered an environmental protection investment and therefore the end-of-pipe environmental protection investment level was higher for that year than in the following years.

**Table 8 Comparison of the reporting of environmental protection investment over the three surveys. 2000-2002.**

	Number of establishments that had reporting to environmental variables included in their annual survey	Number of establishments reporting end-of-pipe investment with fewer than 200 employees	Number of establishments reporting end-of-pipe investment	Per cent of establishments included in survey that reported end-of-pipe investment	Number of establishments reporting integrated technology investment <sup>1</sup>	Total end-of-pipe investment Million NOK	Total integrated technology investment Million NOK	Total Gross Investment Million NOK	Per cent of gross investment for environmental protection
2000	4 845	483	545	11.2	.	794	.	15 528	5.2
2001	4 689	387	373	8.0	.	586	.	16 526	3.5
2002	990	.	180	18.2	99	426	438	11 135	7.8

<sup>1</sup>Can include establishments that have also reported end-of-pipe investment (a type of "double counting")

The percentage of establishments included in the survey that reported end-of-pipe investment was highest in 2002 when this reporting was requested using a separate questionnaire for environmental protection expenditure. In 2000 and 2001 the reporting was incorporated into the standard industry questionnaire as a single additional question. These results would tend to indicate that there is better reporting when using a separate survey instrument than when the question is simply one of the questions about investment included in the standard industry questionnaire.

The following 3 tables provide breakdowns of the data according to size groups (according to number of employees) over the three year period. There was a majority of establishments reporting that had fewer than 200 persons employed in 2000 and 2001. However, 68 per cent of the amount of end-of pipe investment was reported by establishments with 200 or more persons employed in 2000 and 64 per cent in 2001. For the 2002 sample survey, a cut-off criteria of 200 or more persons employed was chosen to be sure that most of the largest establishments in Norway were included. Using this criterion, 144 of the 185 establishments with 200+ employed persons were included and responded to the environmental protection expenditure survey. In addition to these large establishments, 846 establishments with fewer than 200 employed persons sent in responses to the 2002 questionnaire.

**Table 9 Size breakdown of establishments in industrial statistics and with regards to environmental protection investment in end-of-pipe plant and equipment. 2000**

Size groupings after number of employed persons	Number of establishments	Number of employed persons	Production Value 1000 NOK	Environmental protection investment in end-of-pipe plant and equipment						
				Number of establishments reporting end-of-pipe investment	Number of employees in the establishments reporting end-of-pipe investment	Production Value in the establishments reporting end-of-pipe investment 1000 NOK	End-of-pipe Investment 1000 NOK	Per cent of establishments reporting end-of-pipe investment	Per cent of employed persons in establishments reporting end-of-pipe investment	Per cent of production value in establishments reporting end-of-pipe investment
<b>Total</b>	<b>11 763</b>	<b>286 479</b>	<b>496 493 770</b>	<b>545</b>	<b>48 592</b>	<b>125 243 485</b>	<b>793 788</b>	<b>4.6</b>	<b>17.0</b>	<b>25.2</b>
0-4	4 573	11 407	16 020 050	8	25	82 405	763	0.2	0.2	0.5
5-9	2 616	18 115	19 468 530	17	135	313 194	2 459	0.6	0.7	1.6
10-19	1 890	26 900	31 980 967	116	1 612	2 246 757	10 877	6.1	6.0	7.0
20-49	1 557	50 064	68 433 841	185	5 971	10 623 470	83 598	11.9	11.9	15.5
50-99	579	42 834	67 069 650	83	5 760	9 227 213	35 174	14.3	13.4	13.8
100-199	342	48 503	85 636 827	74	10 288	22 036 005	117 855	21.6	21.2	25.7
200+	206	88 656	207 883 905	62	24 801	80 714 441	543 062	30.1	28.0	38.8

**Table 10 Size breakdown of establishments in industrial statistics and with regards to environmental protection investment in end-of-pipe plant and equipment. 2001**

Size groupings after number of employed persons	Number of establishments	Number of employed persons	Production Value 1000 NOK	Environmental protection investment in end-of-pipe plant and equipment						
				Number of establishments reporting end-of-pipe investment	Number of employees in the establishments reporting end-of-pipe investment	Production Value in the establishments reporting end-of-pipe investment 1000 NOK	End-of-pipe Investment 1000 NOK	Per cent of establishments reporting end-of-pipe investment	Per cent of employed persons in establishments reporting end-of-pipe investment	Per cent of production value in establishments reporting end-of-pipe investment
<b>Total</b>	<b>11 161</b>	<b>276 489</b>	<b>508 400 151</b>	<b>373</b>	<b>36 941</b>	<b>116 018 019</b>	<b>585 985</b>	<b>3.3</b>	<b>13.4</b>	<b>22.8</b>
0-4	4 303	10 595	17 814 400	10	29	81 183	482	0.2	0.3	0.5
5-9	2 401	16 645	19 851 188	29	194	229 347	2 648	1.2	1.2	1.2
10-19	1 833	26 074	32 115 713	57	789	989 179	13 816	3.1	3.0	3.1
20-49	1 515	49 214	72 018 320	105	3 542	6 554 236	33 245	6.9	7.2	9.1
50-99	587	43 505	71 621 566	63	4 303	8 626 731	27 108	10.7	9.9	12.0
100-199	334	46 522	88 250 765	63	8 521	17 158 248	135 844	18.9	18.3	19.4
200+	188	83 934	206 728 199	46	19 563	82 379 095	372 842	24.5	23.3	39.8

**Table 11 Size breakdown of establishments in industrial statistics and with regards to environmental protection investment. 2002**

Size groupings after number of employed persons	Total Number of establishments	Total Number of employed persons	Total Production Value 1000 NOK	Environmental protection investment in end-of-pipe plant and equipment and integrated technology						
				Number of establishments reporting values in the environmental protection expenditure survey	Number of employees in the establishments reporting values in the environmental protection expenditure survey	Production Value in the establishments included in the environmental protection expenditure survey 1000 NOK	Environmental protection investment 1000 NOK	Per cent of establishments reporting values in the environmental protection expenditure survey	Per cent of employed persons in establishments reporting values in the environmental protection expenditure survey	Per cent of production value in establishments reporting values in the environmental protection expenditure survey
<b>Total</b>	<b>11 134</b>	<b>272 884</b>	<b>498 319 042</b>	<b>990</b>	<b>100 170</b>	<b>242 786 902</b>	<b>863 375</b>	<b>8.9</b>	<b>36.7</b>	<b>48.7</b>
0-4	4 549	11 837	20 042 613	80	204	1 011 061	1 231	1.8	1.7	5.0
5-9	2 235	16 363	18 884 049	76	513	1 190 448	1 382	3.4	3.1	6.3
10-19	1 778	26 124	34 197 764	179	2 615	5 441 526	9 104	10.1	10.0	15.9
20-49	1 486	48 883	71 862 813	226	7 505	15 517 164	24 204	15.2	15.4	21.6
50-99	570	41 963	70 468 331	150	10 574	23 654 146	26 120	26.3	25.2	33.6
100-199	331	46 503	87 158 901	135	19 353	39 548 161	67 225	40.8	41.6	45.4
200+	185	81 211	195 704 572	144	59 406	156 424 396	734 110	77.8	73.2	79.9

One approach to improving the coverage would be to have the cut off criterion equal to 100 employed persons rather than the current 200 cut off criterion. This increase of approximately 250 establishments could perhaps be counteracted by a reduction in the number of establishments from the categories 0-19 employed persons. This change could increase the coverage of production value by nearly 17 per cent.

## 2.9 Conclusions and further work for manufacturing, mining and quarrying (excluding NACE 11)

During this work we have successfully established a new survey in a cost-effective way that makes use of Statistics Norway's established routines for manufacturing statistics. This has also enabled us to use a number of standard manufacturing variables for control and editing purposes since there is a coordination of the samples drawn for both surveys and the fact that establishments are the unit of analysis for both the industry survey and the environmental protection expenditure survey. This also allows for better consistency between the two sets of statistics.

Although some establishments telephoned for help regarding the filling out of the questionnaire, there did not appear to be major problems with answering the questions. And in general there were no major objections to filling out the questionnaire. We interpret this as a good sign regarding the questionnaire format since previous experience has shown that more objections are raised if the information requested is too difficult to obtain, there is no obvious relevance or if the questionnaire is very difficult to fill out. A more grounded evaluation of the questionnaire by our questionnaire methodology experts may help to identify areas in the questionnaire that could be improved. For example, the instructions, questions or examples could perhaps be changed to improve their clarity.

One specific thing that should be evaluated in the questionnaire is the addition of another answer check box for questions 1 and 2 which request information about current expenditures for wastewater and waste. The additional answer option would state "Yes, but these costs are included in the rent paid for the locale and cannot be identified for reporting separately." This would help

reduce the number of "no" responses and also help to know that other information sources need to be used to help identify these costs.

The control and editing procedures are another area that needs to be improved. Currently the values are checked against totals to be sure that the environmental protection expenditures are simply less than the total (investment or current expenses). Perhaps a more limited tolerance should be considered since most investment levels are less than 25 per cent of total investments. Information in environmental reports and annual reports can also be useful in evaluating the reporting from larger enterprises and it can also act as a source of supplementary information regarding the figures that are reported in the questionnaire. This is feasible only for some of the larger establishments however, often these are the units that are reporting the greatest environmental protection investment and current expenditures and are therefore of particular interest to know more about what is reported.

The control and editing of the variable, investment in integrated technology also needs to be improved by more active use of the description of the investment provided by the respondent. From the short description provided, it may be possible to evaluate at least whether the investment described should or should not be included as an environmental protection investment. For the 2002 data this evaluation was not included in the editing process due to lack of resources. A brief examination of some of the descriptions provided by respondents revealed that especially some of the investments placed under the category "other" may be more relevant as safety (fire) or health and therefore not necessarily "environmental protection."

Estimation methods and grossing up methods also need to be developed and routines for these established. Estimating values for establishments responding "don't know" to the questions regarding current expenditures for wastewater and waste treatment also needs to be considered since it is assumed that all enterprises have these types of expenses even if they cannot report them. Also procedures for grossing up the figures from the sample to the population need to be developed. Using a sampling method where there is a cutoff of 200-employees appears to be fairly adequate in terms of coverage for the majority of the enterprises having substantial environmental protection investment, however this approach does not provide adequate coverage for current expenditures for environmental protection. Therefore, estimating and grossing up procedures need to be developed for future surveys. Adjusting the criteria used to draw the sample also needs to be considered. The criteria used to draw the sample also need to be adjusted in relation to potential grossing up procedures with respect to having the sample be representative of the population.

Major steps in establishing investment for environmental protection (both end-of-pipe and integrated technology) and current expenditures for environmental protection as part of Statistics Norway's official manufacturing statistics have been made. Future work will need to focus on improving the quality of these statistics.

### 3 Steam and Hot Water Supply Industry (NACE 40.3)

An annual survey separate from the standard industry survey is conducted for NACE 40.3. Therefore to collect data for this industry it was necessary to modify the standard questionnaire and include questions regarding end-of-pipe investment.

#### 3.1 2001 and 2002 Data collection methodology for NACE 40.3

##### 3.1.1 Survey instrument

The same approach was used for collecting data on pollution treatment (end-of-pipe) investments in the steam and hot water supply industry as was used in the manufacturing industry in 2000 and 2001. This simply means that a new section asking about pollution treatment (end-of-pipe) investments was included in the standard survey questionnaire for the steam and hot water supply industry in the section that requests data regarding all investment activity.

The following figure is an excerpt from the survey instrument that shows the relevant section for reporting end-of-pipe investment. See Appendix 6.2 for further details and the survey instrument in its entirety.

**Figure 7 Relevant section from questionnaire sent to enterprises in NACE 40.3 showing how the data for end-of pipe investment are requested to be reported. 2001 and 2002. (English translation of the Norwegian is given in parentheses)**

13. Investeringer og reparasjoner i 2001 (Investments and repairs in 2001)			Anskaffet (Aquisitions) 1000 kr	Solgt (Sales) 1000 kr	Reparasjoner (Repairs) 1000 kr
	Produksjonsanlegg (production plant)	1301			
	Distribusjonsanlegg (distribution plant)	1302			
	Annet (other)	1303			
	I alt (total)	1304			
Miljøverntiltak: Investeringer i anlegg og utstyr for rensing og utslippsreduksjon (også kalt "end of pipe") i løpet av året. Post 1305 skal være inkludert i postene 1301- 1304 over. Beløp i 1000 kr. (Environmental protection measures: Investment in plant and equipment for cleaning and reducing pollution (also called "end of pipe") during the year. Post 1305 is included in the posts 1301- 1304 above. Amount in 1000 NOK.)		1305	Luft/klima (Air/climate)	Produksjonsvann og avløp (cooling water and wastewater)	Avfall (Waste)
			Jord og grunnvann (Soil and groundwater)	Biolog. mangfold og landskap (Biodiversity and landscape)	Annet (Other)

The last section in the questionnaire, section 13, is the relevant reporting part of the questionnaire. In this section, total investment, sales of capital goods and repairs are requested for the production plant (line 1301) and the distribution plant (line 1302) and for 'other' (line 1303). The question for environmental protection investment in pollution control and reduction (end-of-pipe) is requested

in line 1305 and is divided up into 6 categories, Air/climate, wastewater and production water, waste, soil and groundwater, biodiversity and landscape and other. The instructions clarify that the figures reported for environmental protection expenditure should already be included in the reporting made in lines 1301-1304 and that this is a request for a more detailed breakdown of the investments made.

The environmental domains included in the survey were: air/climate, cooling water and wastewater, waste, soil and groundwater, biodiversity and landscape, and other. Which includes the SBS regulation's pilot study environmental domains for soil and ground water and biodiversity and landscape. There is also national interest for information regarding biodiversity and landscape so these extra categories have been included.

### **3.1.2 Survey information**

There is an annual census taken of the steam in hot water supply industry. In the 2001 survey, the entire population of 31 establishments were included in the survey. Of these, four reported end-of-pipe investments, or 13 per cent of the population.

In the 2002 survey, the entire populations of 44 establishments were included in the survey. Of these, 4 reported end-of-pipe investments, or 9 per cent of the population.

Two establishments reported end-of-pipe investment both years. This does tend to indicate that the establishments are able to report this type of information since it is not the same 4 establishments in both years. This also shows that investments of this type are not made annually for many establishments so this does not make it easy to determine the non-response level for this information.

The reported environmental protection investment data was controlled by comparing the total end-of-pipe investment amount (sum of post 1305) against the amount for total investments reported on the same section of the questionnaire (post 1304 Acquisitions). The control was that total environmental protection investment amount could not be greater than the total of the acquisitions reported as investments in section 13 of the questionnaire [(sum of post 1305) < (post 1304 Acquisitions)].

Control and editing any type of investment reporting is difficult since these types of investments may not be done every year. There is also no expectation that all enterprises would have this type of investment every year. Exactly how many establishments would have this kind of investment is currently difficult to know and this will only be obtained through experience and with a longer time series of data. Currently it is difficult to know whether the establishments not reporting any of this type of environmental protection investment actually did not have any or simply did not fill out the areas of the questionnaire. This potential non-response to this question will need to be considered in the future.

## **3.2 Survey results for 2001 and 2002 for investment in Pollution Treatment equipment (end-of-pipe) for NACE 40.3 Steam and Hot Water Supply**

The following table presents the 2001 and 2002 results for the steam and hot water supply industry (NACE 40.3).

**Table 12 Investment in Pollution Treatment equipment (end-of-pipe) for NACE 40.3  
Steam and Hot Water Supply according to environmental domain. 2001 and 2002**

Year	Number of Local kind of activity units	Investment in pollution treatment equipment (end-of-pipe). 1000 NOK							Gross investment (Acquisitions less disposals of fixed assets)	End of pipe investment as percent of Gross investment
		Air/ climate	Waste- water	Solid waste	Soil and Biodiversity Ground- water Landscape	Other	Total	1000 NOK	Per cent	
2001	31	40 578	-	1 006	-	-	3 778	45 362	330 929	13.7
2002	44	84 036	-	-	3 465	-	9 596	97 097	626 369	15.5

### 3.3 Conclusions and further work for NACE 40.3

Since this survey is conducted as a census there is no need to gross up the figures reported. Since so few establishments report this type of investment, checking environmental reports and annual reports for information regarding investment for environmental protection could be one way to try to check if establishments are reporting these types of investments. Another approach would be to identify the establishments with high investments that year and contact them directly if none of the investment is specified as related to environmental protection since the figures show that around 14 to 16 per cent of investment is made for environmental protection (end-of-pipe).

Now that some experience has been gained from the manufacturing industries with respect to the other two environmental variables, it may be time to consider using a similar separate questionnaire for the Steam and hot water supply industry (NACE 40.3).

## 4 Future development work

The control and editing process and grossing up processes are the two main areas that need further development work. A more sophisticated control and editing process needs to be established where the environmental reporting by companies in their annual report and in their separate environmental reports are consulted as part of the control and editing process. This is particularly relevant for large enterprises. In addition the control criterion which compares the reported environmental protection investment against total investment and current expenditures for environmental protection against total current expenditure could also be made more restrictive. In addition, better use of the information provided regarding the descriptions of the integrated investments needs to be implemented during the data control and editing phase.

Grossing up the figures from the sample survey and making estimations for medium and small establishments, especially for current expenditures, also needs work in the future. Finding appropriate grossing up factors as well as using other available information for estimating current costs, especially for wastewater and waste treatment, needs to be addressed in the next phases of establishing and improving these statistics.

Expanding data collection for NACE 40.3 steam and hot water supply to include integrated technology investments and current expenditures for environmental protection also needs to be considered. However, this industry is so small in Norway that the costs of expansion both to Statistics Norway and to the industry need to be carefully examined before this is done.

There has been interest shown for these new statistics by the Federation of Norwegian Process Industries (PIL), the national media (newspapers) and a few environmental organisations. In the future we expect that this information will also be of interest to other industry and environmental organizations and government ministries.


## 5 References

- Eurostat (2001): Definitions and guidelines for measurement and reporting of environmental protection expenditure, revenues and related matters Draft final version, Doc. ENV-EXP/TF-IDC/01/2, Meeting of the Task Force "Environmental Protection Expenditure – Industry Data Collection" Meeting of 6 and 7 June 2001
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- Hass, Julie L. and Tone Smith (2002): Methodology Work for Environmental Protection Investment and Current Expenditures in the Manufacturing Industry: Final Report to Eurostat. Statistics Norway, Documents 2002/3.
- Statistics Norway (2003): Manufacturing Statistics 2000, Industrial figures. Official Statistics of Norway. NOS D284. [http://www.ssb.no/emner/10/07/nos\\_industri/nos\\_d284/nos\\_d284.pdf](http://www.ssb.no/emner/10/07/nos_industri/nos_d284/nos_d284.pdf)
- Statistics Norway website addresses for publication of related statistics:**  
Environmental protection expenditures in manufacturing, mining and quarrying industries: [http://www.ssb.no/english/subjects/01/06/20/miljokostind\\_en/](http://www.ssb.no/english/subjects/01/06/20/miljokostind_en/)  
Manufacturing statistics. Structural data: [http://www.ssb.no/english/subjects/10/07/sti\\_en/](http://www.ssb.no/english/subjects/10/07/sti_en/)  
District heating statistics: [http://www.ssb.no/english/subjects/10/08/10/fjernvarme\\_en/](http://www.ssb.no/english/subjects/10/08/10/fjernvarme_en/)

## **6 Appendix 1: Survey instruments**

### **6.1 Survey instruments for Manufacturing industry (NACE 10, 12-37)**

## 6.1.1 Industry Statistics questionnaire for 2000


 <b>Statistisk sentralbyrå</b> Statistiska Norge	Seksjon for energi og industristatistikk Postboks 8131 Dep., 0033 Oslo Telefon: 21 09 00 00 Telefaks: 21 09 49 96	Undergitt taushetsplikt Oppgaveplikt
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**Industristatistikk 2000**  
 Strukturstatistikk

Frist for innsending: 30 juni 2001

 **I2**

Kopi av hele Næringsoppgaven og RF-1052 Avstemming av egenkapitalen skal vedlegges skjemaene!

Sysselsetting (kun hele tall)	Antall (hele tall)
110 Ansatte    Februar    April    Juni    September    November    Sum +    +    +    +    +    =    : 5	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
120 Eiere (kun i ansvarlige selskap og enkeltmannsforetak)	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
150 Sysselsatte $\perp$	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
170 Av dette deltidsansatte (arbeider mindre enn normal arbeidstid)	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
180 Utførte timeverk av ansatte	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
Produksjonsinntekter (inkl. interne leveranser) fordelt på:	i 1 000 kroner
210 Salg av egenproduserte varer $\perp$	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
220 Salg av handelsvarer	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
230 Reparasjonsarbeid	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
240 Leiearbeid $\perp$	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
250 Andre salgsinntekter	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
260 Øvrige driftsinntekter (leieinntekter, provisjonsinntekter, royalties og patenter m.m.)	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
290 Sum (ekskl. subsidier og gevinst ved avgang anleggsmidler)	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
295 Herav: Interne leveranser til andre bedrifter i foretaket $\perp$	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
Produksjonskostnader (inkl. interne leveranser)	i 1 000 kroner
310 Råvarer, halvfabrikata og hjelpestoffer og emballasje	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
314 Solgte handelsvarers kostnad	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
316 Leiearbeid (fremmedytelser og underentrepriser)	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
320 Energiforbruk	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
330 Frakt og spedisjon vedrørende salget	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
340 Lønn, feriepenger, honorarer mv.	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
350 Arbeidsgiveravgift	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
360 Reparasjon og vedlikehold	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
370 Leiekostnader (fast eiendom og driftsmidler) $\perp$	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
380 Forbruk av andre varer og tjenester (se rettledning)	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
390 Sum (ekskl. lagerendringer, av- og nedskrivninger, tap på fordringer og tap avgang anl.midl.)	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>
395 Herav: Interne leveranser fra andre bedrifter i foretaket	<div style="border-bottom: 1px solid black; width: 100px; height: 15px;"></div>

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Lager (i 1 000 kr)		31.12.2000	1.1.2000
420 Lager av varer under tilvirkning og prosjekter i arbeid			
430 Lager av egentilvirkede ferdigvarer			

Investeringer og reparasjoner (i 1000 kr)	Anskaffelser	Salg (til salgspris)	Vedl./Reparasjoner
520 Bygninger og anlegg			
530 Tomter og andre grunnareal			
540 Boliger inkl. boligtomter			
550 Skip, rigger, fly mv.			
560 Varebiler mv.			
570 Kontormaskiner			
580 Personbiler, maskiner, inventar, og andre driftsmidler			
<b>590 I alt</b>			
595 Investerings- og reparasjonsarbeider utført av bedriftens egne ansatte (del av 590)			

Leasing (i 1000 kr)	Anskaffelser
596 Verdien av fysiske driftsmidler ervervet ved finansiell leasing i året	

Investeringer til miljøvern (i 1000 kr)	Luft	Avløp	Avfall	Støy	Annet
597 Investeringer i anlegg og utstyr for rensing og utslippsreduksjon(end-of-pipe)					

Her føres utstyr som kan behandle, forhindre, kontrollere eller måle forurensing, bl.a.: Renseanlegg, rørledninger, skorsteiner, eksossystemer, forbrenningsovner, gjenvinningscontainere, deponier, inkluder overvåkingsutstyr og bygninger.)

Software (i 1000 kr)	Totale utgifter	Herav aktivert
601 Innkjøpt programvare/software		
602 Egenutvikling av programvare/software for egen bruk		

Bedriftens næring
Bedriften er plassert i næring
Hvis De mener dette ikke er riktig, ber vi Dem beskrive virksomhetens art og/eller føre opp de (inntil) tre viktigste produktene bedriften produserer:

Henvendelser fra Statistisk sentralbyrå kan rettes til
Navn: _____ Tlf: _____ e-post: _____
Sted/dato: _____ Underskrift: _____
Foretakets/bedriftens hjemmeside på Internett: _____

Henvendelser fra Dem til Statistisk sentralbyrå kan rettes til
Angående utsettelse av innsending: Guro Henriksen (tlf. 21 09 47 65,ghe@ssb.no) eller Ida Høye (tlf. 21 09 44 72,ilh@ssb.no)
Angående utfylling av skjema: Per Hellem (tlf. 21 09 47 63,peh@ssb.no) eller Slawomir Slazak (tlf. 21 09 47 56,ssl@ssb.no)

Andre opplysninger og meldinger til Statistisk sentralbyrå

☐ Hovedresultatene fra undersøkelsen ønskes tilsendt:

## 6.1.2 Industry Statistics questionnaire for 2001

 <b>Statistisk sentralbyrå</b> Statistiska Norge	Seksjon for energi- og industristatistikk Postboks 8131 Dep., 0033 Oslo Telefon: 21 09 00 00 Telefaks: 21 09 49 96	Undergitt taushetsplikt Oppgaveplikt
<h1 style="margin: 0;">Industristatistikk 2001</h1> <p style="margin: 0;">Strukturstatistikk</p>		
<b>12</b>		
Kopi av hele Næringsoppgaven og RF-1052 Avstemming av egenkapitalen skal vedlegges skjemaene!		
Sysselsetting (kun hele tall)		Antall (hele tall)
110 Ansatte (ansatte personer i alt, inkl. deltid)		
Februar    April    Juni    September    November    Sum	+    +    +    +    +    =    : 5	
120 Eiere (kun for ansvarlige selskap og enkeltmannsforetak)		
150 Sysselsatte i alt		
170 Av dette deltidsansatte (arbeider mindre enn normal arbeidstid)		
180 Utførte timeverk av ansatte		
Produksjonsinntekter (inkl. interne leveranser) fordelt på:		i 1 000 kroner
210 Salg av egenproduserte varer		
220 Salg av handelsvarer		
230 Reparasjonsarbeid		
240 Leiearbeid		
250 Andre salgsinntekter		
260 Øvrige driftsinntekter (leie- og provisjonsinntekter, uopptjent inntekt og annen driftsrelatert inntekt)		
290 Produksjonsinntekter i alt (unntatt subsidier og gevinst ved avgang anleggsmidler)		
295 Av dette: Inntekter fra interne leveranser til andre bedrifter i foretaket		
Produksjonskostnader (inkludert interne leveranser) fordelt på:		i 1 000 kroner
310 Råvarer, halvfabrikata, hjelpestoffer og emballasje		
314 Solgte handelsvarers kostnad		
316 Leiearbeid (fremmedytelser og underentrepriser)		
320 Energiforbruk		
330 Frakt og spedisjon vedrørende salget		
340 Lønn, feriepenger, honorarer mv.		
350 Arbeidsgiveravgift		
360 Reparasjon og vedlikehold		
370 Leiekostnader (fast eiendom og driftsmidler)		
380 Forbruk av andre varer og tjenester (se rettleiding, ekskl. lagerendringer, av- og nedskrivninger, tap på fordringer og tap avgang anleggsm.)		
390 Produksjonskostnader i alt		
395 Av dette: Kostnader for interne leveranser fra andre bedrifter i foretaket		

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Lagerbeholdning ( i 1 000 kr, se rettledning)		31.12.2001	1.1.2001
420 Lager av varer under tilvirkning og prosjekter i arbeid			
430 Lager av egentilvirkede ferdigvarer	T		
<b>Investeringer og reparasjoner (i 1000 kr)</b>		<b>Anskaffelser</b>	<b>Salg (til salgspris) Vedl./Reparasjoner</b>
520 Bygninger og anlegg			
530 Tomter og andre grunnareal			
540 Boliger inkl. boligtomter			
550 Skip, rigger, fly mv.			
560 Varebiler mv.	T		
570 Kontormaskiner			
580 Personbiler, maskiner, inventar, og andre driftsmidler			
<b>590 Investeringer og reparasjoner i alt</b>			
595 Egentilvirkede anleggsmidler og reparasjonsarbeider utført av bedriftens egne ansatte (del av 590)			
<b>Driftsmidler ervervet ved finansiell leasing i løpet av året (i 1000 kr)</b>		<b>Anskaffelser</b>	
596 Verdien av fysiske driftsmidler ervervet ved finansiell leasing i løpet året			
<b>Investeringer til miljøverntiltak i utslipps- og renseutstyr i løpet av året (i 1000 kr, ikke beholdningsverdier)</b>			
597 Investeringer i anlegg og utstyr for rensing og utslippsreduksjon (Prosessekstern, også kalt end-of-pipe. Post 597 skal være en del av post 590 Anskaffelser over)	<b>Luft/klima</b>	<b>Produksjonsvann og avløp</b>	<b>Avfall</b>
	<b>Jord og grunnvann</b>	<b>Biolog. mangfold og landskap</b>	<b>Annet</b>
<b>Datautstyr og programvare anskaffet i løpet av året (i 1000 kr)</b>		<b>Totale utgifter</b>	<b>Herav aktivert</b>
601 Innkjøp av datautstyr			
602 Innkjøpt programvare/software som ikke er tatt med i post 601 Innkjøp av datautstyr			
603 Egenutvikling av programvare/software for eget bruk			
<b>Bedriftens næring</b>			
Hvis dere mener at deres bedrift er plassert i feil næring, ber vi Dere beskrive virksomhetens art og/eller øre opp de (inntil) tre viktigste produktene bedriften produserer:			
<b>Hvis dere har noen spørsmål, ta gjerne kontakt med oss:</b>			
Angående utsettelse av innsending: Guro Henriksen (tlf. 21 09 47 65, ghe@ssb.no) eller Britt-Inger Sande (tlf. 21 09 49 78, brs@ssb.no)			
Angående utfylling av skjema: Per Hellem (tlf. 21 09 47 63), Britt-Inger Sande (tlf. 21 09 49 78), Slawomir Slazak (tlf. 21 09 47 56)			
<b>Hvem kan vi kontakte hos dere?</b>			
Navn: _____ Tlf: _____ e-post: _____			
Sted/dato: _____ Underskrift: _____			
Foretakets/bedriftens hjemmeside på internett: _____			
<b>Andre opplysninger og meldinger til Statistisk sentralbyrå</b>			
<input type="checkbox"/> Kryss av her hvis dere ønsker hovedresultatene fra undersøkelsen tilsendt		Takk for hjelpen!	

### 6.1.3 Instructions and questionnaire for 2002 including all 3 environmental protection expenditure variables



**Statistisk sentralbyrå**  
Statistics Norway

## Miljøvernutgifter i industri og bergverkdirft - 2002

### Hvorfor spør vi?

Formålet med denne undersøkelsen er å kartlegge industriens og bergverkdirftens miljøvernutgifter. Resultatene skal brukes til statistikk, analyse og internasjonal rapportering og sammenligning.

### Hvem bør svare?

En regnskapsansvarlig person i din bedrift har sannsynligvis den mest egnede kompetansen for å besvare skjemaet. I bedrifter med egen miljøansvarlig kan også denne personen ha oversikt over utgifter knyttet til miljøvernaktiviteter.

### Hva er miljøvernutgifter?

Miljøvernutgifter er utgifter knyttet til tiltak og aktiviteter som har som **hovedformål** å forebygge, redusere eller behandle forurensning eller andre skader på det fysiske miljøet. Vi spør i dette skjemaet etter tre typer miljøvernutgifter:

1. Driftsutgifter
2. Prosesseksterne investeringer (end-of-pipe)
3. Prosessinterne investeringer (integreert teknologi)

Definisjonen av utgifter skal bygge på avgrensningen i regnskapsføringen og det som oppgis som hhv. drifts- eller investeringsutgifter i annen statistikkrapportering. Utgifter til forberedelse, installasjon og tester mv. av utstyr og anlegg føres som investerings- eller driftsutgifter i samsvar med regnskapsføringen ellers. Utgifter til reparasjon og vedlikehold av utstyr er driftsutgifter.

Alle utgifter skal oppgis eksklusive moms/investeringsavgift, og eksklusive eventuell finansielle støtte.

### Hva er ikke miljøvernutgifter?

Hvis utgiften ikke først og fremst er rettet mot miljøvern, skal den ikke klassifiseres som en miljøvernutgift. Energiøkonomiseringstiltak og arbeidsmiljøtiltak skal ikke inkluderes som miljøvernutgifter, og heller ikke miljøvennlige produkter.

### Hvilke typer miljøformål skal rapporteres?

Utgiftene skal kategoriseres etter hvilket miljøformål tiltakene i hovedsak er rettet mot. Hvis et tiltak dekker mer enn ett miljøformål, skal utgiftene settes på hovedformålet:

1. avløp og produksjonsvann
2. avfall
3. luft og klima
4. jord og grunnvann
5. biologisk mangfold og landskap
6. andre miljøvernformål (f.eks. støy, vibrasjoner, stråling, miljørapportering og -styring, forskning)

### Merknadsfelt

Bruk eventuelt merknadsfeltet til slutt i skjemaet for å gi kommentarer og forklaringer på spørsmål du har besvart med "vet ikke" og på vanskelige avgrensingsforhold.

**Frist for innsending er: 13.juni.2003**



## Undersøkelsen om miljøvernutgifter Industristatistikk 2002

**Viktig:** Blanketten skal leses maskinelt, så det er derfor viktig at utfyllingen blir utført nøyaktig. Fyll ut skjemaet fortløpende etter nummereringen på spørsmålene. **Bruk blå eller svart penn.**

Sett kryss slik: ☒ og ikke slik: ☐

Hvis kryss i feil rute: ☐

Skriv tall slik:

1	2	3	4	5	6	7	8	9	0
---	---	---	---	---	---	---	---	---	---

### Del 1. Driftsutgifter

#### Hva skal med?

- Lønnskostnader til ansatte som arbeider med miljøspørsmål, rapportering og utslippstillatelser
- Utgifter til eksterne konsulenter, kjøp av andre tjenester
- Utgifter til utslippstillatelser, avfallsgebyr og avløpsgebyr mv.
- Kjøp av varer, kontorkostnader mv. som inngår i produksjon av miljøvern tiltak
- Drift, reparasjon og vedlikehold av miljøvernutstyr, utgifter til operasjonell leasing av miljøvernutstyr

#### Hva skal ikke med?

- Generelle miljøskatter, f.eks. CO<sub>2</sub>-avgifter (SSB får denne informasjonen via andre kanaler og trenger ikke direkte rapportering fra bedrifter)
- Avskrivninger (utgifter relatert til kapitalslitasje)
- Renter på lån
- Bot for brudd på utslippstillatelser eller andre miljørelaterte bøter eller kompensasjon o.l. til tredje part for skader knyttet til miljøskadelig utslipp

#### 1 Hadde bedriften driftsutgifter knyttet til **avløp og produksjonsvann** i 2002?

For eksempel: avløpsgebyrer, drift og vedlikehold av oppsamlingstanker, forbehandling av avløp eller produksjonsvann, overvåkings- og analyseutgifter, bruk av filtermedia, utgifter relatert til utslippstillatelser.

- ☐ Ja →
- ☐ Nei
- ☐ Vet ikke

Gå til 2

Hvor stor andel av dette var kjøp fra andre aktører (inkl. gebyrer)? Gi et estimat.

Prosent

#### 2 Hadde bedriften driftsutgifter knyttet til **avfall** i 2002?

For eksempel: avfallsgebyrer, forbehandling og transport av avfall, sortering, dehydrering, avgifting, avvanning, sammenpressing osv., utgifter relatert til utslippstillatelser for spesialavfall, overvåkings- og analyseutgifter.

- ☐ Ja →
- ☐ Nei
- ☐ Vet ikke

Gå til 3

Hvor stor andel av dette var kjøp fra andre aktører (inkl. gebyrer)? Gi et estimat.

Prosent

#### 3 Hadde bedriften driftsutgifter knyttet til **luft og klima** i 2002?

For eksempel: utgifter knyttet til bruk av filtermedia eller andre metoder for reduksjon av utslipp, overvåkings- og analyseutgifter og utgifter relatert til utslippstillatelser.

- ☐ Ja →
- ☐ Nei
- ☐ Vet ikke

Gå til 4

Hvor stor andel av dette var kjøp fra andre aktører (inkl. gebyrer)? Gi et estimat.

Prosent

#### 4 Hadde bedriften driftsutgifter knyttet til **jord og grunnvann** i 2002?

For eksempel: driftsutgifter knyttet til å forebygge forurensning til jord og grunnvann, utgifter til bruk av måleutstyr og utgifter for kontroll, behandling og fjerning av forurensning i jord og grunnvann.

- ☐ Ja →
- ☐ Nei
- ☐ Vet ikke

Gå til 5

Hvor stor andel av dette var kjøp fra andre aktører (inkl. gebyrer)? Gi et estimat.

Prosent

**5** Hadde bedriften driftsutgifter knyttet til **biologisk mangfold og landskap** i 2002?

For eksempel: vedlikehold av områder som beskytter eller rehabiliterer fauna, flora eller naturlandskap, vedlikehold av utvendig og allment tilgjengelig parkanlegg.

- ☐ Ja →
- ☐ Nei
- ☐ Vet ikke

Gå til **6**

1 000 kr. eks. MVA

Hvor stor andel av dette var kjøp fra andre aktører (inkl. gebyrer)? Gi et estimat.

Prosent

⌊

**6** Hadde bedriften driftsutgifter knyttet til **andre miljøvernformål** i 2002?

For eksempel: utgifter rettet mot å redusere støy, vibrasjoner eller stråling. Utgifter til forskning og utvikling. Generelle driftsutgifter knyttet til arbeid med miljørapportering, miljøstyringssystemer, årsmeldinger om miljøresultater og miljøvernrelatert opplæring av ansatte (men ikke intern HMS). Andre utgifter som ikke kan fordeles etter miljøområde tas også med her.

- ☐ Ja →
- ☐ Nei
- ☐ Vet ikke

Gå til **Del 2. Investeringer**

1 000 kr. eks. MVA

Hvor stor andel av dette var kjøp fra andre aktører (inkl. gebyrer)? Gi et estimat.

Prosent

## Del 2. Investeringer

Spørsmålene om investeringsutgifter er delt i to ut fra type investering: spørsmålene 7 til 13 omhandler prosesseksterne investeringer, mens spørsmålene 14 til 24 omhandler prosessinterne investeringer. Skillet mellom prosesseksterne og prosessinterne investeringer er vanskelig. Les forklaringen nedenfor nøye før du begynner å fylle inn svarene, slik at du unngår å måtte korrigere utfyllingen.

**Prosesseksterne investeringer:** Investeringer i utstyr og anlegg for å samle opp, måle eller fjerne forurensning etter at den er oppstått i produksjonsprosessen, samt behandle og deponere avfallsstoffer. Dette er utstyr og anlegg som er uavhengig av produksjonsprosessen. Slikt utstyr betegnes også som "end-of-pipe-utstyr."

**Prosessinterne investeringer:** Investeringer knyttet til renere teknologi i selve produksjonsprosessen, dvs. utstyr eller anlegg som skal forhindre at forurensning oppstår eller som reduserer omfanget av den. Slikt utstyr og slike anlegg betegnes også som integrert teknologi, renere teknologi eller "pollution prevention". Utgiftene til miljøverninvesteringer vil her kunne være deler av de totale utgiftene til nytt utstyr eller anlegg. Dette kan gjøre det vanskelig å anslå selve miljøvernutgiften. Se veiledning før spørsmål 14 for utdypende forklaring.

### 2a. Prosesseksterne investeringer

**7** Har bedriften gjort investeringer i prosesseksterne anlegg eller utstyr i 2002?

- ☐ Ja → Gå til **8**
- ☐ Nei
- ☐ Vet ikke

Gå til del 2b om prosessinterne investeringer

⌊

**8** Har bedriften gjort investeringer i prosesseksternt utstyr eller anlegg rettet mot **avløp eller produksjonsvann** i 2002?

For eksempel: tiltak som begrenser utslipp, oppsamlingsbasseng for lekkasjer, eget renseanlegg, rørledninger til renseanlegg og avløpsnett, kjølesystemer for produksjonsvann, nøytraliseringstanker, sedimenteringstanker, utstyr for behandling av avløpsslam, overvåkningsutstyr.

- ☐ Ja →
- ☐ Nei
- ☐ Vet ikke

Gå til **9**

1 000 kr. eks. MVA

**9** Har bedriften gjort investeringer i prosesseksternt utstyr eller anlegg rettet mot **avfall** i 2002?

For eksempel: containere, sorteringsutstyr, godkjente forbrenningsovner, egne deponier, avfallspresse, slamtørkeseng, utstyr for hygienisering eller forbehandling, biler for transport av avfall.

- ☐ Ja →
- ☐ Nei
- ☐ Vet ikke

Gå til **10**

1 000 kr. eks. MVA

**10** Har bedriften gjort investeringer i prosesseksternt utstyr eller anlegg rettet mot **luft og klima** i 2002?

For eksempel: filter, sykkloner, kjølesystemer, katalysatorer for behandling av prosessgasser, renseutstyr med posefilter eller elektrofilter, andre tiltak for begrensninger av utslipp av støv og partikler, tiltak som begrenser utslipp, overvåkningsutstyr.

- ☐ Ja →
- ☐ Nei
- ☐ Vet ikke

Gå til **11**

1 000 kr. eks. MVA

⌊

- 11** Har bedriften gjort investeringer i prosesseksternt utstyr eller anlegg rettet mot **jord og grunnvann** i 2002?

For eksempel: utstyr for rensing av forurensert jord, tiltak for å forebygge forurensning av jord og grunnvann, beskyttelse mot erosjon, samt forsøtning, utstyr for å redusere bruk av grunnvann i produksjonsprosessen.

☐ Ja → 1 000 kr. eks. MVA  
☐ Nei  
☐ Vet ikke

Gå til **12**

- 12** Har bedriften gjort prosesseksterne investeringer rettet mot bevaring av **biologisk mangfold og landskap** i 2002?

For eksempel: skogplanting med formål å bevare arter, beplantning av trær og busker for å lage naturlige korridorer for fauna eller skjule bygninger og andre tekniske inngrep, opparbeiding av parker tilgjengelige for allmennheten, bevaring av områder pga. biologisk mangfold, rehabilitering av landskap.

☐ Ja → 1 000 kr. eks. MVA  
☐ Nei  
☐ Vet ikke

Gå til **13**

- 13** Har bedriften gjort investeringer i prosesseksternt utstyr eller anlegg rettet mot **andre miljøvernformål** i 2002?

For eksempel: lydfeller, støyvegger, innbygging av støykilder, utstyr for å redusere vibrasjoner, kjøp av datasystemer for miljøstyringssystemer og miljørapportering.

☐ Ja → 1 000 kr. eks. MVA  
☐ Nei  
☐ Vet ikke

Gå til delen om **prosessinterne investeringer**

## 2b. Prosessinterne investeringer

I denne delen skal du oppgi alle investeringer knyttet til renere teknologi i selve produksjonsprosessen, dvs. utstyr eller anlegg som skal forhindre at forurensning oppstår eller som reduserer omfanget av den. For den enkelte investering skal det oppgis en prosentandel knyttet til miljøvern (miljøvernutfikken).

For investeringsutgifter der formålet med investeringen i sin helhet har vært redusert utslipp/bedre miljø regnes hele investeringsutgiften som en miljøvernutfikken.

For investeringer der hensikten delsvis har vært miljøhensyn og dels å få en mer effektiv produksjonsprosess el., er det bare utgiftsdelen som er knyttet til miljøvern som regnes som miljøvernutfikken. Dette kan det være vanskelig å identifisere. I slike tilfeller kan følgende framgangsmåte brukes:

1. Dersom det finnes rimeligere alternativer til den investeringen som er gjort, men som ikke ville gi de oppnådde miljøeffekter, regnes differansen mellom den faktiske utgiften og det rimeligere alternativet som miljøvernutfikken.
2. Dersom det er mulig å anslå en merkostnad som skyldes miljøhensyn, kan denne merkostnaden regnes som miljøvernutfikken.
3. Dersom det ikke er mulig å gi et anslag på miljøverndelen av investeringen, gi likevel en beskrivelse av investeringen, men sett 0 i prosentfeltet i stedet.

Utgifter til nytt utstyr og maskiner som har bedre miljøegenskaper enn de som skiftes ut, regnes ikke som miljøvernutfikken dersom disse bedrede egenskapene har blitt standard teknologi.

### Eksempler på prosessinterne investeringer:

#### Avløp og produksjonsvann:

Resirkuleringsystemer, lukkede kjølesystemer, vakuumpumper, utstyr for gjenbruk av eller for å redusere bruken av vann i produksjonsprosessen.

#### Avfall:

Investeringer i utstyr/prosesser som gir mindre avfall, mindre skadelige avfallstyper eller mer effektiv bruk av råstoffer, f.eks. ved at de muliggjør endringer i innsatsvarer.

#### Luft og klima:

Tanker med flytende tak (sammenliknet med f. eks. tanker uten tak), systemer for damputveksling og resirkulering av prosessgasser, kontrollsystemer for optimal forberedning/drift, endringer som er nødvendig for bruk av mindre miljøskadelig kjølemedia, endringer i produksjonsystemer som betyr at mindre miljøskadelige produkter kan brukes i produksjonsprosessen.

#### Jord og grunnvann:

Dobbeltveggede tanker (sammenliknet med enkeltveggede tanker) installert for vern av jord og grunnvann. Utskrifting av kabler som inneholder PCB.

#### Biologisk mangfold og landskap:

Ekstrakostnader for bevaring av verdifullt landskap eller vernede områder ved utbygging av infrastruktur som f.eks. avløpsnett, el-nett, veier.

#### Andre miljøvernformål:

Fundamentering som demper vibrasjoner og lavstøybrenner, lavstøytstyr og -motorer. Tiltak for å redusere magnetfelt.

- 14** Har bedriften gjort investeringer i integrert eller renere teknologi i 2002?

☐ Ja → Gå til introduksjonen for spørsmål **15**  
☐ Nei  
☐ Vet ikke

Gå til **25**

Kan du gi en kort beskrivelse av investeringen? Oppgi både totalbeløpet for investeringen og et estimat i prosent for den delen av investeringen som er tilknyttet miljøvern. Hvis bedriften har gjort flere små investeringer rettet mot det samme miljøformålet, kan disse slås sammen ved utfyllingen av tabellen.

Hvis du trenger flere linjer, ta kopi av denne siden, fyll den ut og send den som vedlegg!

Beskrivelse av de prosessinterne investeringene	Total investeringsutgift (1000 kr, eks. MVA)	Prosent tilknyttet miljøvern	Hovedmiljøformål (sett bare ett kryss)					
			Avløp/ vann	Luft/ avfall	klima	Jord/ grunn- vann	Biologisk mangfold/ landskap	Annet
15			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

25 Oppgi hvor mange minutter det tok å fylle ut skjemaet, inkludert datainnhenting og skjemautfylling .....  minutter

26 Kryss av for å motta e-postmelding når SSB publiserer resultatene fra denne undersøkelsen ..... ☐

Merknader:

Hvem kan vi kontakte hos dere?

Navn:  Tlf.:  e-post:   
 Sted/dato:  Underskrift:

Hvis dere har noen spørsmål, ta gjerne kontakt med oss:

Angående utfylling av skjema: Julie Hass, Seksjon for miljøstatistikk, tlf. 21 09 45 15, e-post: julie.hass@ssb.no

Angående utsettelse av innsending: Guro Henriksen, tlf 21 09 47 65, e-post: guro.henriksen@ssb.no

## 6.2 Survey Instrument for NACE 40.3 Steam and Hot Water Supply 2001 (and 2002)

There were no changes in the questionnaire for 2002 so this example is also relevant for the data collection for 2002.

The last section in the questionnaire, section 13, is the relevant reporting part of the questionnaire. In this section, total investment, sales of capital goods and repairs are requested for the production plant (line 1301) and the distribution plant (line 1302) and 'other' (line 1303). The question for environmental protection investment in pollution control and reduction (end-of-pipe) is requested in line 1305 and is divided up into 6 categories, Air/climate, waste water and production water, waste, soil and groundwater, biodiversity and landscape and other. The instructions clarify that the figures reported for environmental protection expenditure are already included in the reporting in lines 1301-1304.

English translation of the reporting section is given in parentheses.

<b>13. Investeringer og reparasjoner i 2001</b>	Produksjonsanlegg (production plant)	1301	Anskaffet (Aquisitions) 1000 kr	Solgt (sales) 1000 kr	Reparasjoner (repairs) 1000 kr
	Distribusjonsanlegg (distribution plant)	1302			
	Annet (other)	1303			
	I alt (total)	1304			
	Miljøverntiltak: Investeringer i anlegg og utstyr for rensing og utslippsreduksjon (også kalt "end of pipe") i løpet av året. Post 1305 skal være inkludert i postene 1301- 1304 over. Beløp i 1000 kr. (Environmental protection measures: Investment in plant and equipment for cleaning and reducing pollution (also called "end of pipe") during the year. Post 1305 is included in the posts 1301- 1304 above. Amount in 1000 NOK.)	1305	Luft/klima (Air/climate)	Produksjonsvann og avløp (cooling water and wastewater)	Avfall (Waste)
			Jord og grunnvann (Soil and groundwater)	Biolog. mangfold og landskap (Biodiversity and landscape)	Annet (Other)

Instructions for filling out the questionnaire were also provided to help in filling out the posts (Norwegian only):

### 13. Investeringer og reparasjoner

Disse postene gjelder bare investeringer og reparasjoner foretatt i oppgaveåret. Omfatter anskaffelse av fast kapital f.eks. produksjonsanlegg, som normalt ikke slites ut i løpet av et år, og reparasjoner og vedlikehold utover daglig stell. Investeringsavgift skal være inkludert.

Post 1305 Miljøverntiltak: Omfatter utstyr som er uavhengig av produksjonsprosessen og som kan behandle, forhindre, kontrollere eller måle forurensning. Overvåkningsutstyr og bygninger inkluderes. Investeringer for å forbedre arbeidsmiljø skal *ikke* inkluderes. Investeringer i "renere teknologi", dvs. modifiserte produksjonsprosesser der miljøvernutstyret er integrert i øvrig produksjonsutstyr, er ikke klassifisert som "end of pipe" løsning og skal ikke være med. Totalbeløpet for miljøinvesteringene skal ikke overstige totale

investeringer i og med at post 1305 er en andel av post 1304. Kostnadene klassifiseres etter hvilken type forurensning som er bekjempet. Her følger inndelingen samt noen eksempler:

- *Luft/klima*: Skorsteiner, eksossystemer med filter (scrubbers), tiltak som begrenser regulære og akutte utslipp. Overvåkningsutstyr inkluderes.
- *Produksjonsvann og avløp*: Renseanlegg, rørledninger til renseanlegg, kulverter, oppsamlingsbasseng for lekkasjer, tiltak som begrenser regulære og akutte utslipp til avløpsnett, kjølesystemer for vann før det slippes ut til avløpsnett.
- *Avfall*: Forbrenningsovner, deponier, avfallspresse (utstyr for sammenpressing), slamtørkeseng, utstyr for hygienisering, sedimenteringstanker, søppelbiler.
- *Jord og grunnvann*: Rensing av jord og innsjøer, tiltak for å forebygge infiltrering av forurensning til jord og grunnvann, beskyttelse mot erosjon og annen fysisk degradering, samt forsaltning. Investeringer i utstyr for å redusere bruk av grunnvann. Måleutstyr inkluderes også.
- *Biologisk mangfold og landskap*: Investeringer gjort for å beskytte eller rehabilitere fauna, flora, økosystemer, habitater eller (natur)landskap, f.eks. skogplanting med formål å bevare arter. Beplantning av trær og busker for å lage naturlige korridorer for fauna. Bevaring av områder pga. biologisk mangfold. Måle- og analyseutstyr inkluderes også.
- *Annet*: Her føres andre investeringer innen miljøverntiltak.

**Norsk Fjernvarmeforening**  
 Postboks 7184, 0307 Oslo  
 Tlf: 23088909 **Fax: 23088901**  
 Heidi Juhler, [hmj@ebl.no](mailto:hmj@ebl.no)

**Kopi til: SSB**  
 pb 8131dep, 0033 Oslo  
 tlf: 21 09 44 20, **Fax: 21 09 49 96**  
 Pål Marius Bergh [pmb@ssb.no](mailto:pmb@ssb.no)



## FRIST 18.mars Fjernvarmestatistikk 2001

Nytt navn
Ny adresse

Forespørsler kan rettes til:

_____	_____	_____
Navn	Telefon nr.	Underskrift

<b>Om virksomheten</b>	Har foretaket investert i fjernvarmeanlegg i 2001?		<input type="checkbox"/> Ja	<input type="checkbox"/> Nei	
	Har foretaket produsert fjernvarme i 2001?		<input type="checkbox"/> Ja	<input type="checkbox"/> Nei	
	Hvis nei på begge spørsmål ovenfor: Har foretaket planer om investering i/produksjon av fjernvarme?		<input type="checkbox"/> Ja	<input type="checkbox"/> Nei	
	Hvis ja: Planlagt investeringsstart:		Planlagt igangsettingsdato:		
<b>1. Sysselsetting</b>	Gjennomsnittlig antall:		Kode 0101		
	Utførte timeverk		0102		
	<b>2. Driftsinntekter</b>	Salgsinntekter fjernvarme	- Forbruker (fra 0614 kol. 2)	0201	1000 kr
			- Eget foretak (fra 0701 kol. 2)	0202	+
			- Fjernvarmeverk/everk (fra 0801 kol. 2)	0203	+
		Salgsinntekter elektrisitet, kraftvarme	0204	+	
		Andre driftsinntekter ( unntatt tømmeavgifter)	0205	+	
		Tilskudd fra det offentlige	0206	+	
		Avgifter til det offentlige	0207	-	
		Driftsinntekter i alt	0208	=	
<b>3. Driftsutgifter</b>	Kjøp av fjernvarme (fra 0901 kol. 2)		0301		
	Forbruk av brensel, elektrisitet etc. (fra 0416 kol. 2)		0302	+	
	Lønnskostnader		0303	+	
	Andre driftskostnader		0304	+	
	Driftskostnader i alt		0305	=	

4. For- bruk av brensel				I alt		Av dette til produksjon av fjernvarme	
			Kode	Mengde	Verdi, 1000 kr	Mengde. Bruk samme enhet som i kolonne 1. 3	MWh 4
				1	2		
	Steinkull/koks	tonn	0401				
	Bensin	liter	0402				
	Parafin	tonn	0403				
	Mellomdestillater (nr. 1, nr 2, diesel)	tonn	0404				
	Tungdestillater (nr. 3A og nr. 4A)	tonn	0405				
	Tunge fyringsoljer (nr. 5 og nr. 6)	tonn	0406				
	Elektrisitet i alt	MWh	0407				
	Av dette til: - elektrokjeler	MWh	0408				
	- varmpumper	MWh	0409				
	Avfall	tonn	0410				
	Flis/bark	tonn	0411				
	Spillvarme	MWh	0412				
	Gass	1000 Sm3	0413				
	Annet, spesifiser:		0414				
	I alt (kolonne 2 til post 0302.)		0416				
	Gj.snittlig energiinnhold: - avfall		0417	kWh/tonn			
- flis/bark		0418					
5. Fjern- varme- balanse	Egen bruttoproduksjon (fra 1100 kol.1)		0501	Mengde (MWh)			
	+ Kjøp av fjernvarme (fra 0901 kol. 1)		0502	+			
	- Levert til produksjon av elektrisitet		0503	-			
	- Avkjølt til luft		0504				
	- Tap i fordelingsnett		0505				
	- Levert til fjernvarmeverk/everk (fra 0801 kol. 1)		0506				
	- Levert til bedrifter i eget foretak (fra 0701 kol.1)		0507				
	= Levert forbrukere (fra 0614, kol 1)		0508				

<b>6. Leveranse av fjern- varme til forbruker</b>		Kode	Mengde (MWh)  1	Verdi (1000 kr)  2	Antall hushold- ninger og bedrifter som mottar fjernvarme 3
	Husholdninger	0601			
	Industri og bergverk i alt:	0602			
	Bergverk	0603			
	Produksjon av næringsmidler, drikkevarer og tobakksvarer	0604			
	Treforedling	0605			
	Produksjon av kjemiske råvarer	0606			
	Produksjon av kjemiske produkter ellers	0607			
	Produksjon av jern, stål og ferrolegeringer	0608			
	Produksjon av ikke-jernholdige metaller	0609			
	Annen industri	0610			
	Tjenesteyting, offentlig og privat	0611			
	Jordbruk, skogbruk, fiske og fangst	0612			
	Andre	0613			
	I alt (kol.1 til 0508 og kol. 2 til 0201)	0614			
<b>7. Leveranse til bedrifter i eget foretak</b>	Leverert til (navn):		Mengde (MWh)	Verdi (1000 kr)	
	Leveranse i alt (kol.1 til 0507 og kol. 2 til 0202)	0701			
<b>8. Leveranse til fjern- varme- verk/ever k</b>	Leverert til (navn):		Mengde (MWh)	Verdi (1000 kr)	
	Leveranse i alt (kol.1 til 0506 og kol. 2 til 0203)	0801			
<b>9. Kjøp av fjern- varme</b>	Kjøpt av (navn):		Mengde (MWh)	Verdi (1000 kr)	
	Kjøpt i alt (kol.1 til 0502 og kol. 2 til 0301)	0901			
<b>10. Elek- trisitet produsert i mot- trykksanl.</b>	Leverert til (navn):		Mengde (MWh)	Verdi (1000 kr)	
	Produksjon av elektrisitet i alt (kol. 2 til 0204)	1001			

<b>11. Varme- sentraler, produk- sjon av fjern- varme</b>	Kodeliste for produksjonsanlegg:				
	Elektrokjeler..... 1		Spillvarme..... 4		
	Oljekjeler..... 2		Varmepumpe..... 5		
	Avfallsforbrenningsanlegg..... 3		Flisfyringsanlegg..... 6		
	Andre (spesifiser): ..... 7				
	Navn på varmesentral:		Kode for type prod.anl:	Produksjon av fjernvarme (MWh) 1	Maks. effekt (kW) 2
		Kode 11			
		11			
		11			
		11			
		11			
		11			
		11			
I alt (kol.1 til 0501))		1100			
<b>12. Distri- busjons- nett</b>	Primært distribusjonsnett fjernvarme (grøftelengde i meter)	1201			
	Abonnentsentraler (antall)	1202			
	Sekundært distribusjonsnett (lengde i meter)	1203			
	Tap i fordelingsnett	1204			
<b>13. Invest- eringer og repara- sjoner i 2001</b>	Produksjonsanlegg	1301	Anskaffet 1000 kr	Solgt 1000 kr	Reparasjoner 1000 kr
	Distribusjonsanlegg	1302			
	Annet	1303			
	I alt	1304			
	Miljøverntiltak: Investeringer i anlegg og utstyr for rensing og utslippsreduksjon (også kalt "end of pipe") i løpet av året. Post 1305 skal være inkludert i postene 1301- 1304 over. Beløp i 1000 kr.	1305	Luft/klima	Produksjonsvann og avløp	Avfall
			Jord og grunnvann	Biolog. mangfold og landskap	Annet
	Tilknytningstilskudd til abonnenter	1306	1000 kr		
	Tilknytningsavgift fra abonnenter	1307			

**Kopi til: SSB**  
 pb 8131dep, 0033 Oslo  
 tlf:21 09 44 20, **Fax:21 09 49 96**  
 Pål Marius Bergh pmb@ssb.no



# Fjernkjølestatistikk 2001

Nytt navn
Ny adresse

\_\_\_\_\_ Navn \_\_\_\_\_ Telefon nr. \_\_\_\_\_ Underskrift

<b>Om virksomheten</b>	Har foretaket investert i fjernkjøleanlegg i 2001?		<input type="checkbox"/> Ja	<input type="checkbox"/> Nei
	Har foretaket produsert fjernkulde i 2001?		<input type="checkbox"/> Ja	<input type="checkbox"/> Nei
	Hvis nei på begge spørsmål ovenfor: Har foretaket planer om investering i/produksjon av fjernkjøling?		<input type="checkbox"/> Ja	<input type="checkbox"/> Nei
	Hvis ja: Planlagt investeringsstart:	Planlagt igangsettingsdato:		
<b>1. Sysselsetting</b>	Gjennomsnittlig antall:		Kode 0101	
	Utførte timeverk		0102	
	Salgsinntekter fjernkjøling	- Forbruker (fra 0614 kol. 2)	0201	1000 kr
		- Eget foretak (fra 0701 kol. 2)	0202	+
		- Fjernvarmeverk/everk (fra 0801 kol. 2)	0203	+
	Andre driftsinntekter		0205	+
	Tilskudd fra det offentlige		0206	+
	Avgifter til det offentlige		0207	-
	Driftsinntekter i alt		0208	=
	<b>3. Driftsutgifter</b>	Kjøp av fjernkjøling (fra 0901 kol. 2)		0301
Forbruk av brensel, elektrisitet etc. (fra 0416 kol. 2)		0302	+	
Lønnskostnader		0303	+	
Andre driftskostnader		0304	+	
Driftskostnader i alt		0305	=	

4. Forbruk av brensel			I alt			Av dette til produksjon av fjernkjøling
		Kode	Mengde 1	Verdi, 1000 kr 2		Mengde 3
	Elektrisitet til varmepumper (MWh)	0409				
	Fjernvarme (absorpsjons-kjøling) (MWh)					
	Spillvarme (MWh)	0412				
	Annet, spesifiser:	0414				
	I alt (kol. 2 til 0302)	0416				
5. Fjern- kjøle- balanse	Egen bruttoproduksjon (fra 1100 kol.1)	0501	Mengde (MWh)			
	+ Kjøp av fjernkjøling (fra 0901 kol. 1)	0502	+			
	- Tap i fordelingsnett	0505				
	- Levert til fjernvarmeverk/everk (fra 0801 kol. 1)	0506				
	- Levert til bedrifter i eget foretak (fra 0701 kol.1)	0507				
	= Levert forbrukere (fra 0614, kol 1)	0508				
6. Leveranse av fjern- kjøling til forbruker	Husholdninger	0601	Kode	Mengde (MWh) 1	Verdi (1000 kr) 2	Antall hushold- ninger og bedrifter som mottar fjernkjøling 3
	Industri og bergverk i alt:	0602				
	Tjenesteyting, offentlig og privat	0611				
	Jordbruk, skogbruk, fiske og fangst	0612				
	Andre	0613				
	I alt (kol.1 til 0508 og kol. 2 til 0201)	0614				
7. Leveranse til bedrifter i eget foretak	Levert til (navn):			Mengde (MWh)	Verdi (1000 kr)	
	Leveranse i alt (kol.1 til 0507 og kol. 2 til 0202)	0701				

<b>8. Leveranse til fjern-varme-verk/everk</b>	Leverert til (navn):			Mengde (MWh)	Verdi (1000 kr)
	Leveranse i alt (kol.1 til 0506 og kol. 2 til 0203)		0801		
<b>9. Kjøp av fjern-kjøling</b>	Kjøpt av (navn):			Mengde (MWh)	Verdi (1000 kr)
	Kjøpt i alt (kol.1 til 0502 og kol. 2 til 0301)		0901		
<b>10. Elek-trisitet produsert i mot-trykksanl.</b>	Leverert til (navn):			Mengde (MWh)	Verdi (1000 kr)
	Prod. av el i alt (kol. 2 til 0204)		1001		
<b>11. Varme-sentraler, produksjon av fjern-kjøling</b>	Kodeliste for produksjonsanlegg: Elektrokjeler..... 1                      Spillvarme..... 4 Oljekjeler..... 2                            Varmepumpe..... 5 Avfallsforbrenningsanle.... 3                Flisfyringsanlegg..... 6  Andre (spesifiser): ..... 7				
	Navn på varmesentral, samt varmekilde for evt. varmepumpe:		Kode for type prod.anl:	Produksjon av fjernkjøling (MWh) 1	Maks. effekt (kW) 2
		Kode 11			
		11			
		11			
		11			
		11			
		11			
		11			
		11			
		11			
	I alt (kol.1 til 0501))		1100		
	<b>12. Distri-busjons-nett</b>	Primært distribusjonsnett fjernkjøling (grøftelengde i meter)	1201		
Abonnentsentraler (antall)		1202			
Sekundært distribusjonsnett (lengde i meter)		1203			
Tap i fordelingsnett		1204			

<b>13. Invest- eringer og repara- sjoner i 2001</b>	Produksjonsanlegg	1301	Anskaffet 1000 kr	Solgt 1000 kr	Reparasjoner 1000 kr
	Distribusjonsanlegg	1302			
	Annet	1303			
	I alt	1304			
	Miljøverntiltak: Investeringer i anlegg og utstyr for rensing og utslippsreduksjon (også kalt "end of pipe") i løpet av året. Post 1305 skal være inkludert i postene 1301- 1304 over. Beløp i 1000 kr.	1305	Luft/klima	Produksjonsvann og avløp	Avfall
			Jord og grunnvann	Biolog. mangfold og landskap	Annet
	Tilknytningstilskudd til abonnenter	1306	1000 kr		
	Tilknytningsavgift fra abonnenter	1307			

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