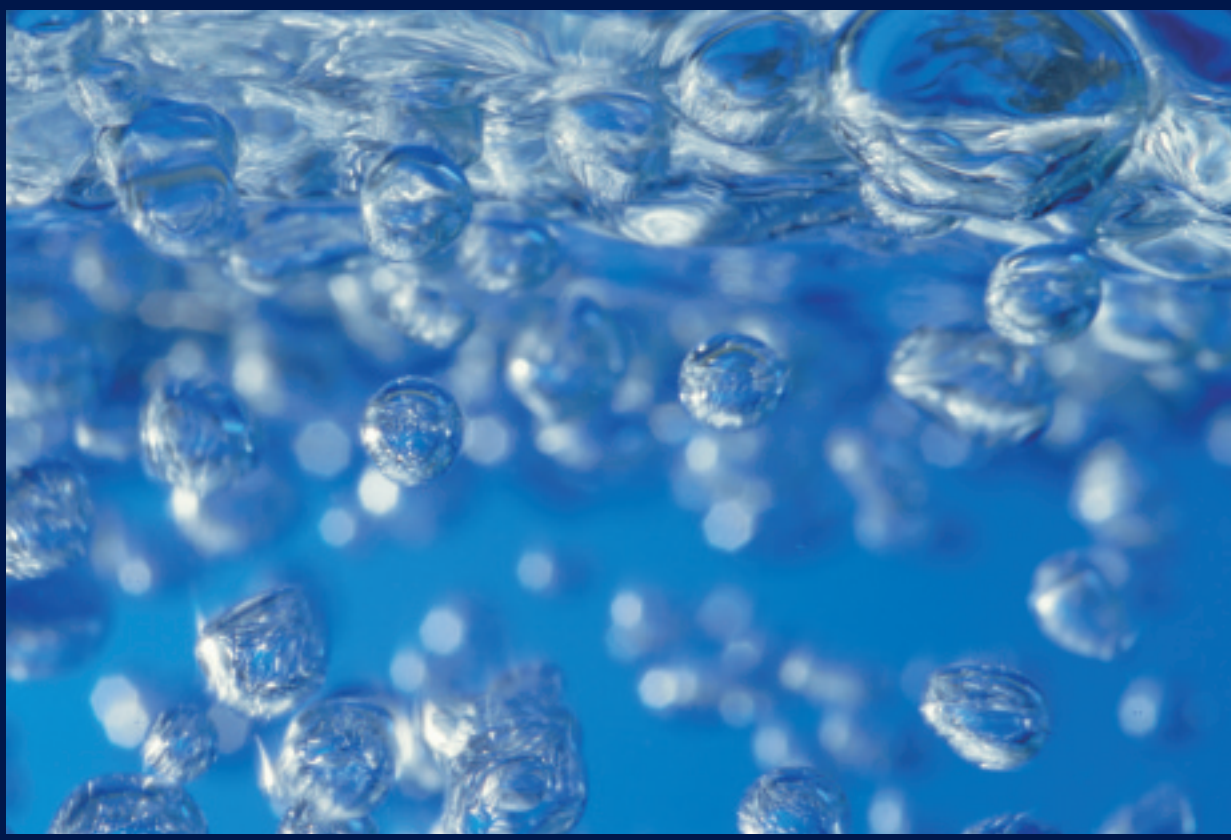
Ministry of Environment, Denmark

Environmental Expenditure in the NIS

Russian Country Report



OECD OCDE

EAP Task Force

DEPA/DANCEE

Danish Environmental Protection Agency
Danish Cooperation for Environment in Eastern Europe

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The work was coordinated by a DEPA steering committee also comprising representatives of the Organisation for Economic Cooperation and Development (OECD) and the beneficiary ministries.

2001

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Background

The Danish Ministry of Environment and Energy, The Danish Environmental Protection Agency, (The Danish EPA) has decided to fund a number of projects to provide assistance to the OECD Environmental Action Plan Task Force (EAP TF) Secretariat and directly to selected Ministries of Environment in the NIS.

The projects commenced in August 1999. The present document, "Environmental Expenditure in the NIS, Russian Country Report", is one of a series of documents coming from the projects.

The projects will:

- Provide assistance in elaborating national environmental financing strategies in four selected countries in the NIS, viz.: Georgia, Kazakhstan, Moldova and Ukraine.

- Provide assistance in elaborating regional environmental financing strategies in two selected regions in the Russian Federation, viz.: Novgorod and Pskov regions.

- Provide assistance to the EAP TF in the preparation of a survey on the use of economic instruments for pollution control and natural resources management in the New Independent States.

- Conduct a study of the suitability of the OECD methodology for assessment of environmental expenditure based on case studies in Georgia and two regions in the Russian Federation, viz.: Novgorod and Pskov.

Table of Contents

Table of Appendices

Abbreviations and Acronyms

CEE	Central and Eastern Europe
DANCEE	Danish Cooperation for Environment in Eastern Europe
EAP	Environmental Action Programme for Central and Eastern Europe
EC	Environmental committee
EF	Environmental fund
Goskomekologiya	State committee for Environmental Protection of the Russian Federation
Goskomstat	State Statistical Committee of the Russian Federation
JSC	Joint stock company
ME	Municipal enterprises
NGO	Non-governmental organisation
NIS	New Independent States
Oblstat	Oblast Statistical Committee
OECD	Organisation for Economic Cooperation and Development
PAC	Pollution abatement and control
PCE	Pollution charge exemptions
PU	Public utilities
RUR	Russian Ruble
R&D	Research and development
USD	US Dollar
WWT	Wastewater treatment
WWTP	Wastewater treatment plant
1-EKOFOND	Reporting form, titled "Revenues and Expenditure of Environmental Funds"
Form 18-KS	Reporting form, titled "Capital Investments for Environmental Protection and Rational Use of Natural Resources"
Form 4-OS	Reporting form, titled "Current Expenditure on Nature Protection, and Ecological and Natural Resource Payments"

1 Introduction

Purpose of report

The purpose of this country report is to present the results of the environmental expenditure data collection carried out in Novgorod and Pskov oblast's, Russia, from November 1999 through to April 2000. It provides information on levels and trends in environmental expenditure in the two Russian regions during 1995-1998.

Principal authors

The report was prepared within the framework of the project entitled "Environmental Financing Strategies, Environmental Expenditure and Use of Economic Instruments in NIS Countries", with which COWI has been entrusted by DANCEE and the EAP Task Force Secretariat at the OECD. Its principal authors were Mr. Jørgen Jordal-Jørgensen and Mrs. Nina Korobova, both COWI staff members. However, numerous people, both inside and outside the two regions, have assisted considerably in data collection and processing.

Methodology paper

The data collection and the subsequent data processing and analyses were carried out in accordance with the OECD environmental expenditure methodology as outlined in the methodology paper, which was (also) prepared within the framework of the project[1]. It sets up guidelines for the data collection on environmental expenditure in Novgorod oblast, Pskov oblast and Georgia. Furthermore, it establishes a framework for the subsequent data processing and analyses. The methodology paper should ensure the provision of comparable, consistent and reliable data, which, to the extent possible, is in accordance with the OECD environmental expenditure methodology.

PAC/non-PAC

For the purpose of this survey the OECD PAC expenditure methodology has been supplemented with other environmentally related expenditure. In this report, this extended framework of environmental expenditure is referred to as "PAC/non-PAC".

Three reasons

In brief, there are three reasons why the provision of comparable, consistent and reliable environmental expenditure data in the NIS is of utmost importance:

- It allows for cross-country (and cross-regional) comparisons, thereby making it possible to trace the impacts of the "Environment for Europe" process.

[1] Working Paper No 3: Methodology Paper

- It provides a baseline for environmental financing strategies aimed at supporting the implementation of the National Environmental Action Plans.
- It provides valuable information to decision-makers, both inside and outside the NIS countries, NGOs in the NIS countries and others.

Organisation of report

The country report is organised as follows: Chapter 3 provides information on the methodology applied, including the samples and surveys. However, it does not include a thoroughfare of the above mentioned methodology paper. Chapter 4 presents the results from the data collection in Novgorod oblast, while Chapter 5 presents those from Pskov oblast. Finally, Chapter 6 contains the conclusions to be drawn from the previous three chapters. Furthermore, four annexes are attached providing additional information related to the report.

Acknowledgements

The project team is grateful to a number of institutions that have provided immense assistance in data collection. Without their assistance it would have been impossible to complete this country report. In Novgorod oblast, the project team would like to thank the Novgorod Oblast Environmental Committee, Novgorod Oblast Statistical Committee, Novgorod Oblast Administration and the surveyed enterprises and utilities. In Pskov oblast, the project team would like to thank the Pskov Oblast Environmental Committee, Pskov Oblast Statistical Committee, Pskov Oblast Administration and the surveyed enterprises and utilities. Furthermore, the project team would like to thank the Goskomekologiya and Goskomstat; they have followed the data collection closely.

Disclaimer

The opinions expressed are those of the consultant. The Danish Ministry of Environment and Energy - Danish Environmental Protection Agency (Danish EPA), the OECD EAP TF and the beneficiary ministries may not agree with these opinions.

Confidentiality

All information provided by the enterprises will be kept strictly confidential and will not be given to third parties without written consent.

2 Methodology applied

The purpose of this chapter is to provide information on the methodology applied in the data collection and processing made in Novgorod and Pskov oblasts. A detailed description of the process of work and the data collection and processing is provided, enabling the reader to assess the validity of the data.

In both regions, environmental expenditure statistics are collected at regular intervals. However, the official statistics do not cover all forms of environmental expenditure. Furthermore, it differs considerably from the OECD environmental methodology. Thus, it has not been possible to rely solely on official statistics.

2.1 Work process

This section describes the work process from November 1999 through to April 2000, highlighting the results of a gap analysis, listing the institutions approached in order to obtain additional data, the time period covered and any major events.

2.1.1 Gap analysis

Prior to implementing the data collection for this survey, official data sources were thoroughly analysed to identify possible gaps for conversion to the OECD PAC expenditure methodology.

Need for new data collection

This analysis showed that the officially published data on environmental expenditure (forms 18-KS, 4-OS and 1-EKOFOND) does not provide the following information:

- The breakdown of investments into end-of-pipe investments and process integrated investments;
- Form 4-OS does not contain the necessary information to break down current expenditure into PAC/non-PAC categories;
- Current expenditure for nature protection, noise, radiation (only land protection is available in other categories);

- User fees only covered wastewater and solid waste sectors;
- Resource taxes do not include tax on local resources;
- Information on pollution charges and resource fees is not broken down into the various government levels (federal, regional, local);
- Information on funding sources is only available for investments and does not distinguish between local government level and regional government level. Furthermore, information on funding sources only covers three environmental media: water, air, land;
- Incomplete coverage of enterprises with environmental expenditure:

  Enterprises with foreign capital are not obliged to fill in forms;

  Enterprises which have no environmentally fixed assets, and do not pay pollution charges or user fees are not required to fill in form 4-OS even though their main activity may be environmental services (solid waste management enterprises are a typical example: many of these do not own fixed assets, instead they lease the fixed assets from the municipality);

  Forms 4-OS and 18-KS were not filled in by all vodokanals.
- The public sector's current expenditure and investment expenditure are not covered, with the exception of environmental fund disbursements (but without environmental administration cost);
- Neither 1-EKOFOND nor budget data provide a break-down by environmental media or by industry;
- A breakdown by ISIC codes is not presently available, as the ISIC classification will first be introduced in Russia after the year 2003.

2.1.2 Institutions approached

Data collection centres

To cover these gaps the following data collection and processing centres were identified:

- Oblast statistical committees – to rearrange sector data in accordance with ISIC codes, for both current expenditure and investment expenditure, and to analyse investments in order to provide a break down into PAC/non-PAC categories;
- Oblast environmental committees – to analyse 1-EKOFOND and provide a break down into categories media and industry, to analyse investments made by enterprises, to break down into PAC/non-PAC categories, to evaluate administration costs by Environmental Committees and Environ-

mental Funds and to break down data on local and regional levels (only for Novgorod oblast);

- Oblast and local administrations – to provide information on subsidies by media, resources taxes and transfers between different public sector levels;
- Regional resource committees – to collect data on current expenditure (mainly administration and monitoring) and investment expenditure for resource management;
- Selected enterprises and utilities – to breakdown environmental expenditure into PAC/ non-PAC, to investigate the price distortions caused by non-monetary transactions, subsidies received by media and fees paid, to identify and calculate the difference between environmental expenditure calculated by the Russian and by the OECD PAC expenditure methodology respectively.

2.1.3 Time period

Time period covered by the study

The study covers the period 1995 – 1998. The years prior to 1995 were affected by extremely high inflation. The official statistical data for 1999 was collected in February 2000. This data will be processed by the authorities in June 2000 and will not be published before October 2000.

The breakdown of data on manufacturing industries, according to the ISIC classification, has only been carried out for 1998.

2.1.4 Major events

Data collection and analysis process

The OECD PAC expenditure methodology was presented to the key actors from Novgorod and Pskov at the workshop held in Novgorod on November 23-24, 1999. At this workshop, data availability and main sources were discussed and potential local experts were identified.

For each data collection centre, separate questionnaires were prepared and sent out in December 1999.

Local experts from Novgorod and Pskov statistical committees rearranged the official statistical data according to the ISIC classification, and together with experts from COWI Moscow, separated the information on investments into PAC and non-PAC categories.

The oblast environmental committees assigned a co-ordinator who was responsible for sending and collecting questionnaires from the various administrations and resource committees as well as local experts. This person was also responsible for filling in the oblast questionnaire and for collecting information from local environmental committees and environmental funds.

The oblast environmental committees, in co-ordination with and following the approval of the oblast administration, selected the enterprises to be included in the sample for the enterprise survey. 19 enterprises and utilities were included from Novgorod oblast and 33 enterprises and utilities were included from Pskov oblast.

Novgorod and Pskov Audit Centres carried out the enterprise interviews, and provided assistance in filling in the questionnaires.

At the workshop in Novgorod on January 12, 2000, the progress of the data collection and the understanding of the OECD PAC expenditure methodology principles were discussed. Representatives from the data collection centres, in both Novgorod and Pskov, participated in this workshop. Both Novgorod and Pskov oblast authorities provided significant support and willingness in promoting the process. However, it was noted that the period for data collection was rather short due to the New Year vacations.

For more a detailed analysis of non-monetary transactions and discrepancies in environmental expenditure presented by the Russian and the OECD methodologies, five case studies were chosen. These are the following:

- Vodokanal in Velikie Luki (Pskov oblast), non-monetary transactions case study.
- Vodokanal in Borovichi (Novgorod oblast), non-monetary transactions case study.
- Chemical producer “Akron” (Novgorod oblast), calculation of differences between methodologies.
- Locomotive repairing depot (Pskov oblast), calculation of differences between methodologies.
- Pollution charge exemptions. The regional environmental funds in Novgorod and Pskov oblast's were asked to provide detailed information on pollution charge exemptions made in 1998.

The data collection and treatment process continued throughout January and into the beginning of February. Finally, the data processing and data conversion to the OECD tables was carried out by the COWI Moscow team in February and March 2000.

The final seminar held in Budapest on February 28-29 presented the preliminary results of the survey and provided the basis for future co-operation between Russia, OECD and the EU in converting Russian environmental expenditure statistics to international standards. On the Russian side, this workshop was attended by vice-governors and deputy chairmen of the oblast statistical committees in Pskov and Novgorod, chairmen of the oblast environmental committees, the Head of Department for Environment Statistics of Goscomstat

of the Russian Federation and the Director of the Centre of Environmental Programmes under Goscomecologia of the Russian Federation.

The final results of the Pskov and Novgorod surveys were presented at the workshop on financing strategies in May 2000.

2.2 Data collection and processing

This section describes the data collection and processing.

Four types of data have been collected:

- Existing data from official statistical surveys which can be obtained without further survey and analysis;
- Data collected and/or analysed by statistical authorities, environmental committees, resources committees and local administrations;
- Interview data collected from a sample of enterprises;
- In-depth case studies.

The general method of calculating environmental expenditure according to the abater principle has been as follows:

- Firstly, the environmental expenditure data officially reported on forms 18-KS and 4-OS expenditure is converted to the OECD PAC expenditure methodology.
- Secondly, data from the resources committee, environmental committee and local and oblast administration questionnaires is added. This refers, for instance, to current public sector environmental expenditure for monitoring and management, for investments toward tree planting along roads, for resource taxes, etc.
- Thirdly, data on expenditure from the sample enterprise questionnaire is added to the extent the expenditure reported in the new questionnaire is not already covered in official reporting or in questionnaires from the above mentioned regional authorities (funding from EFs in cash and exemptions provided, funding from budgets, etc.).

Pollution charge exemptions for enterprise environmental expenditure was added to form 18-KS in cases where this expenditure was not reported by the enterprises. Here, the assumption is made that enterprises actually did carry out the corresponding environmental activities. However, it should be noted that this has not been verified.

Vodokanal environmental expenditure for water supply and wastewater expenditure was calculated based on "1-vodoprovod" and "1 – kanalizatsia" respectively and added to the environmental expenditure data.

2.2.1 Official statistical data

There are three main sources of official statistical data on environmental expenditure: forms 4-OS, 18-KS and 1-EKOFOND. The first two are collected and published by the State Statistical Committee of the Russian Federation (SSC), and 1-EKOFOND is collected by the State Committee for Environmental Protection of the Russian Federation (Goskomekologiya).

Form 18-KS

Form 18-KS should be filled in by enterprises and public utilities implementing environmental investments. Enterprises with foreign investments are not obliged to fill in form 18-KS.

Form 18-KS contains data on environmental investment expenditure by media, paying special attention to water protection. Published versions for the past years do not comprise breakdown by sector and industry. Data on funding sources is partly available, but does not provide an opportunity to separate local and oblast levels. Investment data is not officially available due to confidentiality. Many enterprises regard this data as confidential, and special permission from the enterprise is required to obtain access to this data.

In 1998, 10 enterprises filled in form 18-KS in Novgorod while 7 enterprises filled in form 18-KS in the Pskov oblast. There are indications that this low response to the questionnaires might seriously underestimate the number of enterprises with environmental investment expenditure. We are aware that some enterprises did not report even if they had carried out some environmental investment. This problem might also apply to the vodokanals - only 2 vodokanals filled in form 18-KS in the Pskov oblast and none in the Novgorod oblast in 1998.

Special problem with public service organisations

Furthermore, there is a particular problem with regard to the environmental investment expenditure in the vodokanals. The vodokanals receive turnkey environmental projects from public organisations and book these as ready made fixed assets, not as investment expenditure. Since the public organisations carrying out these investments do not report the investment expenditure either, this organisational structure leads to evident underestimation of environmental investment expenditure (abater) in the vodokanals.

Form 4-OS

Form 4-OS should be filled in by enterprises and public utilities that have environmental fixed assets, and who pay pollution charges, resource taxes or user fees.

Form 4-OS includes user fees. Thus, when summing up total expenditure based on form 4-OS, user fees are included in the sum. However, according to the OECD abater principle these fees should be excluded in order to avoid double counting. In some sectors the share of user fees in current environmental ex-

penditure reported in form 4-OS is significant. In these sectors the environmental expenditure will differ between the official Russian methodology and the OECD abater principle.

Form 4-OS provides data on current expenditure and capital repair by the following four media:

- water
- air
- solid waste
- land

Thus, nature protection and noise are missing.

Form 4-OS provides no breakdown showing type of activity. The enterprises report current expenditure by media and this data is aggregated at the industrial level by official authorities. This implies that, for instance, current expenditure for water protection cannot be broken down into PAC and non-PAC expenditure, even though they may include both waste water pre-treatment plants (PAC) and water saving systems (non-PAC, resource mobilisation).

In 1998, 114 Novgorod enterprises filled in form 4-OS while 365 enterprises in Pskov filled in form 4-OS. Of these, 29 enterprises provided water services in Novgorod while 7 provided water services in Pskov. Since form 4-OS does not consider the expenditure on water supply as environmental expenditure, enterprises with no expenditure other than the expenditure related to water supply, are not obliged to fill in form 4-OS. For the same reason, water supply fees are not included in the subsection for user fees in form 4-OS.

1-EKOFOND

1-EKOFOND is filled in by the Federal Environmental Fund and the regional environmental funds. This form provides a breakdown of revenues by sources and expenditure according to funding sources but not according to individual projects, industries or media. The latest format includes information on pollution charges exemptions provided by the funds.

Solid waste transportation and disposal

There seems to be serious underreporting of current expenditure regarding solid waste transportation and disposal. Only one solid waste management enterprise in Novgorod reported current environmental expenditure, in Pskov oblast no enterprises reported solid waste transportation and disposal. Therefore, estimating current expenditure for solid waste from the abater principle requires a special survey. Local budget funds to cover current expenditure for municipal solid waste transportation and disposal are available, to a varying extent, for both regions. This demonstrates that data problems in some cases can lead to significant differences between calculations based on the abater and financing principle, unless such data problems are rectified through appropriate corrections.

2.2.2 Survey data

In order to cover the gaps mentioned in the previous section a survey was carried out. The survey contained three main elements:

- Collection and processing of existing but unpublished data
- Survey: questionnaires for the resource committee, local and regional administrations and the environmental committee (environmental fund)
- Collection of new data from a sample of enterprises

The enterprises' interview data collection is described in the following section.

The data collection flow for investment expenditure data is illustrated in Figure 2.1.

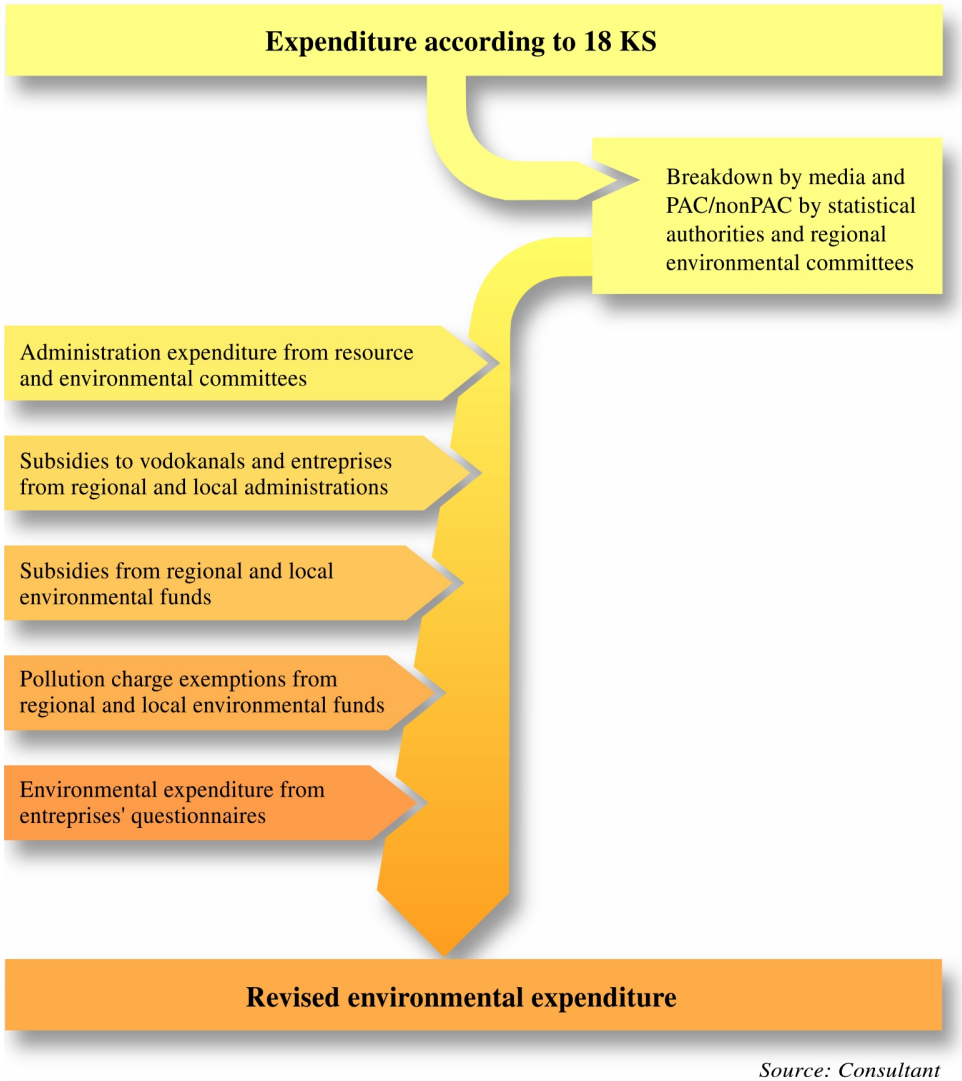


Figure 2.1 Data collection components in the survey

Processing of forms 18-KS and 4-OS

The oblast performed the data processing necessary to make the breakdown into type of industry from the forms 18-KS and 4-OS in accordance with the ISIC classification, PAC/non-PAC, etc. This task had to be carried out by the Oblstat for confidentiality reasons.

All 18-KS forms were evaluated and the investment expenditure was broken down according to the PAC/non-PAC methodology. The assessment was based on a careful analysis of each single investment. A similar procedure was not feasible for the data from the form 4-OS due to the large number of enterprises reporting current environmental expenditure, although some additional data on the category breakdown were achieved from the enterprise interviews.

Furthermore, questionnaires were prepared to cover the gaps found in official statistical formats. These are illustrated in Figure 2.1 by the arrows starting from the left and merging down into the revised environmental expenditure.

Administration expenditure

The administrative costs of government bodies involved in environmental protection are not published. This information was collected from the resource committees, environmental committees and local administration. By collecting this information a category breakdown on funding levels (federal, oblast or local) was obtained.

Subsidies to vodokanals

The administrations provided data on subsidies to the vodokanals and solid waste companies for both investment and current expenditure (compensation of the tariffs for population), as well as resource taxes received. The latter was not broken down by industry. A breakdown would require analysis of each single entity, and since there are many taxpayers this was not found feasible.

For vodokanals, the split between wastewater (PAC) and water supply (non-PAC) was made based on the actual figures reported for 1998. Expenditure on water supply is reported using the statistical form "1-vodoprovod", while expenditure on wastewater is reported using the statistical form "1 – kanalizatsia" (sewerage and WWT system). This data is not available for previous years therefore it has been assumed that the share of the two categories is the same as 1998.

In Novgorod, subsidies were reported from 10 administrations out of 22. In order to calculate the total figure for Novgorod oblast, (available) figures have been extrapolated proportionately to the population.

Budget expenditure (for environmental purposes)

Budget expenditure (subsidies for environmental purposes) from environmental funds was provided by the environmental committees / funding organisations. Data processing in order to break down environmental fund disbursements by industries, by media and by PAC/non-PAC was carried out by the funding organisation's staff.

Pollution charge exemptions

Environmental Funds provided data on subsidies by media, sector and industry. In Pskov, the breakdown of pollution charges received and pollution charge exemptions by media was only available for 1998 as required in the new format. Here, the structure by media for 1998 was assumed to cover the period for

1995-1997 as well. In Novgorod, the Environmental Committee had kept this information from previous years.

Consolidated oblast budget

When local administration subsidies (current expenditure) to vodokanals were compared to similar figures in the regional consolidated budgets, significant underestimation was identified. Assuming mainly the consolidated budget provides the most reliable source of information, it was decided to use this as the data source. However, the consolidated budget is only broken down into two components: 1) investments to municipal and housing economy and 2) subsidies to municipal and housing economy. The breakdown of the consolidated budget into suitable categories in order to find the vodokanal's share was done using expert estimates.

Official budget statistics are very difficult to obtain and use, because an actual budget is not available to the general public. Furthermore, the budget does not explicitly include data on environmental subsidies. Within this project data on environmental subsidies from budgetary sources were collected by local administrations and subsequently assessed by the project team in close co-operation with local experts including representatives of regional administrations.

Enterprise questionnaire

Data on environmental expenditure obtained from the enterprise questionnaires has been checked with the other available data sources in order to avoid double counting. Only data on expenditure, not already covered/included, has been added.

Financial transfers

In this survey, the approach to calculate expenditure according to the financing principle has been to adjust the abater expenditure with the financial transfers between sectors[2]. In principle, the approach should be able to record the financial flows actually taking place. However, assuming that the financial flows reflect abater expenditure and that all expenditure is included, the two approaches should provide the same result.

Financial transfers for environmental expenditure takes place

- Between public sector and public utilities;
- Between public sector and business sector; and
- Between public utilities and business sectors.

The subsidies from the public sector include subsidies from local and oblast budgets:

- Investment subsidies issued to wastewater treatment companies and to solid waste management companies (very limited) and other environmental protection activities.

[2] To some extend there was also used financial data sources to find complete data from the abater side.

- Subsidies issued to compensate tariffs for water supply and wastewater treatment and solid waste management for the population.

The point of departure from these calculations was the data collected in the questionnaires filled in by local and oblast administrations. When comparing this data to regional consolidated budgets it became apparent that there was severe underreporting in the questionnaires from the local administrations. Assuming that the consolidated budget contained the most reliable data, it was decided to use the level from the consolidated budget and to break these figures down by using best estimates from local expert.

Table 2.1 shows the data sources used when calculating financial transfers in this survey.

Table 2.1 Financial transfers

Type of data	Source
Subsidies from federal budget	Form 18-KS
Subsidies from environmental funds (including pollution charge exemptions)	I-EKOFOND
Pollution charges (paid to local and regional authorities)	I-EKOFOND
Pollution charges (paid to federal authorities)	Form 4-OS
User fees from business to vodokanals	Form 4-OS
Resource taxes	Consolidated regional budget (regional and local budgets)

Source: Consultant's estimate.

Information on the subsidies from environmental funds was obtained from the environmental committees and environmental funds although this information is also available in reporting form 4-OS. It was decided to use this method because the environmental committees and environmental funds check their revenues and disbursements very thoroughly, unlike the enterprises who fill in reporting form 4-OS.

Information on user fees paid by the business sector to the vodokanals were taken from form 4-OS and adjusted according to the additional information provided on the enterprise sample questionnaires.

Information on resource taxes was taken from the administration questionnaires.

2.2.3 Enterprise interview sampling

This section describes the sampling procedure applied for setting up a sample of enterprises to measure expenditure using the abater principle.

Enterprise interview plays a minor role

As can be seen from the previous section, the environmental expenditure (both abater and financing principle) has been calculated with data from many sources. Enterprise interview expenditure was only added when these expenditure was not covered by other sources. This means that the enterprise interview data only plays a minor role when calculating the total environmental expenditure.

Sampling principle

The general idea has been to select enterprises representing the major part of the total environmental expenditure. No correction has been made for sample size. Scaling data from the sample to total population would overestimate environmental expenditure, as the sample has been selected in order to find those enterprises with the highest environmental expenditure. Those enterprises not included in the sample are expected to have low or zero environmental expenditure.

The selection criteria were as follows:

- High environmental investment expenditure;
- Role in regional economy and pollution;
- Coverage of different sectors (public, public utilities and business);
- Implementation of environmental investment expenditure (to provide detailed description for the break down in PAC/non-PAC from form 18-KS);
- Coverage of enterprises and organisations not reporting with the forms 4-OS and 18-KS (public sector mostly);
- Willingness to participate in survey.

Table 2.2 and Table 2.3 show the coverage of the sample survey in Novgorod and Pskov.

Table 2.2 Sample of enterprises in Novgorod.

Name of position	Number of enterprises in sample	Number of enterprises in industry	Employed in sample[3]	Employed in industry	Employment coverage %
Vodokanals	4	14	3,114	4,575	68%
Municipal waste services	1	15	282	3,511	8%
Other public utilities	1	7	1,014	5,405	19%
Food, beverages, tobacco	2	39	734	5,928	12%
Wood, wood products	3	37	2,845	9,241	31%
Chemicals, rubber, plastic	2	5	6,327	7,427	85%
Basic metals	1	2	4,840	5,007	97%
Metal products, machinery	1	65	2,182	18,403	12%
Other services	1	568	395	42,823	1%
National Park[1)]	1	2	na		81%
Municipal customer service[2]	2	8	na		30%
Total	21	762	21,733	102,320	21%

Source: COWI

Notes: [1)] Coverage estimated based on area.

[2)] Coverage estimated based on budget share.

[3)] The employment figure for vodokanals is slightly overestimated due to lack of data.

Table 2.3 Sample of enterprises in Pskov.

Name of position	Number of enterprises in sample	Refused to participate	Number of enterprises in industry	Employed in sample[2]	Employed in industry	Employ-ment coverage %
Vodokanals	10	2	18	959	1,550	62%
Other public utilities	2		6	469	3,956	12%
Food, beverages, tobacco	2		205	180	7,505	2%
Non-metallic mineral products	1		66	54	2,570	2%
Metal products, machinery[1]	10		353 (168)	8,195	22,822	36%
Energy	1		656	1,115	28,886	4%
Agriculture, hunting, fishing, forestry[1]	3	1	839 (516)	550	36,399	2%
Transport, storage and com-munications[1]	3		248 (68)	2,155	19,822	11%
National Parks	2					100%
Municipal customer services	2					
Total	36	3	2,391 (1,703)	13,677	123,510	11%

Source: Consultant's estimate.

Note: [1)] Only the number of enterprises in parenthesis reported employment to Oblstat. Therefore the coverage in this industry is overestimated.

[2)] The employment figure for "Agriculture, hunting, fishing, forestry" is slightly overestimated due to lack of data.

Environmental expenditure from enterprises that were not represented in the sample, as well as enterprises that did not fill in the questionnaire, are to a great extent covered by other data sources. Therefore, the total environmental expenditure reported from this survey is estimated to be close to the total expenditure by the oblast.

Municipal enterprises included as abaters

At the seminar in January, in Novgorod, it was decided that the municipal enterprises caring out environmental investments should be included. The reason for this is that these enterprises (so called municipal customer services) manage the use of budget money for investment subsidies to municipal service enterprises, mostly vodokanals. Since they provide the vodokanals with turnkey investments, these municipal customer services may be seen as abaters. However, since these organisations were created quite recently, they do not have a special reporting format and they are not obliged to fill in the form 18-KS.

Enterprise interview data

Data collection from the enterprises was based on a questionnaire in the form of tables which the enterprises should fill in under the guidance of an auditor.

Investment expenditure

All enterprises in the survey were asked to fill in form 18-KS questionnaire for the years 1995 - 1998. For this purpose, the form 18-KS questionnaire was expanded to provide information on financing sources:

- Federal budget
- Regional budget
- Local government budget
- Enterprise funds
- Federal environmental fund
- Regional environmental fund
- Local environmental fund
- Foreign investments

This breakdown was made to avoid double counting.

In addition, the enterprises were asked to describe their investments in words, thereby allowing the research team to segment the investment expenditure according to the OECD PAC expenditure methodology afterwards.

Furthermore, the enterprises were asked to describe their other investments in words and to describe potential environmental benefits from these. Based upon this information the research team would assess the environmental impact of the technological investments.

Finally, the enterprises were asked to report the share of non-monetary transactions in the investments.

Current expenditure

The current expenditure questionnaire also covers the years 1995 to 1998. This questionnaire segments the current expenditure for each year into the following five environmental media.

- Water protection and rational use of water resources
- Air protection
- Waste disposal and/or utilisation
- Noise pollution abatement costs
- Subsoil and land protection

For each of these media the current expenditure was further subdivided according to activities as shown in Table 2.4.

Table 2.4 Current expenditure media and activities

Water protection and rational use of water resources	Air protection	Waste disposal and/or utilisation	Noise pollution abatement costs	Subsoil and land protection expenditure
Water treatment	Scrubbers, dust removal and other air treatment facilities	Waste collection and transport	Noise pollution abatement costs	Land recultivation expenditure
Recycling water systems	Preventive technologies	Disposal at landfills		Expenditure related to clean-up measures
Waste water treatment utilities	Energy saving technologies	Waste disposal and storage at the enterprise		Other expenditure
Preventive technologies	Cleaner goods production, resulting in emissions reduction	Waste treatment and utilisation		
Water saving technologies	Laboratory sampling expenditure	Waste generation decreasing and preventing technologies		
Water body clean-up measures	Management expenditure	Monitoring expenditure		
Water quality improvement measures	Other	Management expenditure		
Water resource replenishment		Other		
Laboratory sampling expenditure				
Management expenditure				
Other				

Source: Consultant's estimate.

Furthermore, the enterprises were asked to report R&D environmental expenditure divided into the following five main media.

- Water protection and rational use of water resources
- Air protection
- Waste disposal and utilisation
- Noise pollution abatement
- Subsoil and land protection

Documentation to the authorities, for instance documentation required in order to obtain discharge permissions, was kept separate.

2.2.4 Case studies

Two case studies were carried out to illuminate deviations between the Russian methodology and the OECD PAC expenditure methodology. The case studies

were carried out in the following manner: two enterprises which had filled in the forms 18-KS and 4-OS, one in Novgorod and one in Pskov, were selected.

The enterprises were interviewed in order to identify investments not covered in the official reporting forms and to obtain more detailed information about the environmental expenditure of these enterprises.

A comparative analysis was then carried out where data from the official reporting forms was compared with the new data obtained from the interview. This analysis included an evaluation of potential underreporting of environmental expenditure and the differences in the definitions of environmental expenditure according to the two methods (the official Russian Forms and the OECD PAC expenditure methodology).

3 Results from Novgorod Oblast

The purpose of this chapter is to present the results from the data collection in Novgorod oblast. The presentation focuses on the 1998 figures, which are the most recent. Results from 1995-1997 are shown in Annex II.

It should be noted that the figures in the tables are given in book values, i.e. they are not corrected for overestimation due to non-monetary transactions[3]. Rough estimations of non-monetary overestimation are given after Table 3.4 for investments and Table 3.11 for current expenditure.

In Novgorod, 19 enterprises filled in the questionnaires.

3.1 Environmental expenditure - abater principle

3.1.1 Investment expenditure

The main source for analysing officially reported investment expenditure data is the form 18-KS. The data from form 18-KS are supplemented by sample survey data and data reported by resource committees and administrations. Both official (form 18-KS) and surveyed investment expenditure was broken down by type of expenditure (PAC/ non-PAC, etc.). Finally, the difference between surveyed and official data is calculated and main sources of discrepancies are discussed.

Water recycling investments

In this report water recycling investments are included in the category "resource mobilisation". However, because water savings also reduce the demand for wastewater treatment these investments could also be included in the category "end-of-pipe investments". In the SERIEE classification, investments for water recycling are included in the management of wastewater activities and therefore considered as PAC investment expenditure[4]. Table 3.1 shows the water recycling investment expenditure for the years 1995 to 1998.

[3] In the survey data tables there has been made some minor corrections based on enterprise interview data. However, these corrections are far from sufficient.

[4] Eurostat: European System for Collection of Economic Information on the Environment (SERIEE) - 1994 Version. Luxembourg, 1994, p. 109.

Table 3.1 Water recycling investments, 1995 to 1998, thousand Roubles

	Official	Survey
1995	0	3,900
1996	500	3,440
1997	680	680
1998	2,180	2,230

Source: Consultant's estimate.

Existing data

Form 18-KS was converted by the project team together with the oblstats and oblast environmental committees. The result from this work is shown in Table 3.2.

Table 3.2 Official data on environmental investment expenditure by media and type of expenditure, 1998, thousand Roubles

Media	PAC		Non-PAC		Addendum	Non-addendum	Total
	End of pipe	Process integrated	Resource mobilisation	Technological improvements			
Air	3,050	0	0		0	0	3,050
Water	5,800	0	2,180		0	0	7,980
Solid waste	10	0	0		0	0	10
Noise							
Other	0	0	0		0	0	0
Total							11,040

Source: form 18-KS

Detailed tables showing the results from converting data from form 18-KS to the OECD PAC expenditure methodology segmented by media and OECD PAC expenditure methodology are presented in Annex II.

Form 18-KS mostly end-of-pipe investments

Most of the lines in form 18-KS describe end-of-pipe investments. Process integrated technologies cannot be identified using form 18-KS, which is why they are represented by a zero in this table.

The enterprises only reported investments for air, water and land protection and solid waste management. The statistical form does not require reporting of noise protection expenditure.

It should be noted that enterprises do not put much effort into filling in form 18-KS due to a lack of control from official authorities.

Surveyed data

As mentioned in the previous chapter, environmental expenditure according to the abater principle has been calculated with many different datasources. The elements in these calculations are shown in Table 3.3.

Table 3.3 Elements in calculating revised environmental investment expenditure, thousand Roubles

			Expenditure according to 18 KS	Added from resource committee questionaires	Added from REF & LEF questionnaires (REF &LEF expenditure)	Added from REF & LEF questionnaires (pollution charges exemptions)	Estimated on the base of Consolidated oblast budget performance report	Added from enterprises questionnaires	Total
Public sector		Regional authorities	5	3,310			1,220		4,530
		Local authorities					6,090		6,090
Public utilities		Vodokanals			460	590		13,010	14,070
		District heating & other PU			10	210		290	510
		Municipal solid waste services			540			360	900
Business sector									
Rus	ISIC	Total	11,040		740	510		9,170	21,460
5	15	Food, beverages, tobacco						2,090	2,090
6	17	Textiles, leather							0
7	20	Wood, wood products	740			40		1,780	2,560
8	21	Pulp, paper, printing			0	0			0
9	24, 25	Chemicals, rubber, plastic	4,210					5,070	9,280
10	23	Refineries							0
11	26	Non-metallic mineral prod.							0
12	27	Basic metals	5,340			70			5,410
13	28-35	Metal prod., machinery	310			20			320
14	36-37	Other			80	370			450
5 – 14			10,590		80	510		8,940	20,120
15	01-05	Agri., hunting, fishing.			230				230
16	10-14	Mining, quarrying							0
17 – 19		Construction, transport	450		440	0		230	1,110
Total			11,040	3,310	1,750	1,310		22,830	47,560

Source: Excel sheet: Novgorod calculations (Novgorod_Invest_98)

Note: Due to rounding, the totals might deviate from the sum that can be calculated based on the figures in the table.

One enterprise had reported some recurrent expenditure (related to investments made) as investment expenditure. This "current" expenditure have been deducted from investments and added to current expenditure.

Public sector abaters added

As the public sector do not use form 18-KS to report information (on expenditure), all abater investment expenditure within the public sector has been added to the official data obtained from form 18-KS. Information on these investments was obtained from the resource committee questionnaires (mostly forestry, hunting and water), and municipal customer services. Furthermore, two nature protection areas were included in the survey even though they did not fill in form 18-KS. One refused to fill in the questionnaire. The other had not made any investments over the reported years.

Table 3.4 shows the total environmental investment expenditure grouped by media, OECD PAC expenditure methodology and other environmental expenditure.

Table 3.4 Survey data on environmental investment expenditure by media and type of expenditure, Thousand Roubles, 1998

Media	PAC		Non-PAC		Addendum	Non-addendum	Total
	End of pipe	Process integrated	Resource mobilisation	Techno-logical investments			
Air	4,160			1,180			5,340
Water	27,800		7,420				35,220
Solid waste	2,720						2,720
Noise							0
Other					4,230	50	4,280
Total	34,680		7,420	1,180	4,230	50	47,560

Source: Form 18-KS, administration, environmental committee, enterprises questionnaires, Land, Forest & Water resource committees

Spreadsheet: for_annex_PACoutline_nvg_en_29m.xls (invest_survey_media).

Note: Due to rounding, the totals might deviate from the sum that can be calculated based on the figures in the table.

Note: Figures are given in book values. i.e. there has been made no significant correction for overestimation due to non-monetary transactions.

Non-monetary transactions

Six enterprises have reported non-monetary transactions. However, only one (Vodokanal Borovichy) was able to estimate the magnitude of the overestimation. For Borovichy, the overestimation was reported to be 30%, corresponding to 24 thousand Roubles for 1998. This insignificant overestimation has been deducted from the figures in the tables. All other values are book values. As-

suming an overestimation of 30%[5] of all non-monetary vodokanal investment expenditure, would reduce the figure with additionally 4,197 thousand Roubles.

Land protection (mainly land re-cultivation) measures are included in media category "Others" in the table. Most of the enterprises simply filled in the sub-total for this media without specifying the investments implemented in detail.

Difference between form 18-KS and new data

The difference between surveyed and officially reported investments is presented in Table 3.5 (subtracting Table 3.2 from Table 3.4). The surveyed environmental investment expenditure is greater due to the non-coverage of official reporting of all investing enterprises and insufficiently detailed elaboration of investment description. The major difference is due to the fact that the vodokanals' expenditure for wastewater is heavily underreported in the form 18-KS. The four vodokanals surveyed in Novgorod did not fill in form 18-KS but reported significant investments in the questionnaires. As the vodokanals did not fill in form 18-KS, their investments (approximately 20 million Roubles in 1998) were added to the official data. This accounts for more than half of the environmental investment expenditure in 1998. Furthermore, Akron, the largest chemical producer in the Novgorod oblast, reported a 75% increase in investment expenditure in the sample survey relative to the official reporting on form 18-KS.

Some of the minor discrepancies refer to the clarification of investments made and the assignment of the investments to the different expenditure types in comparison to form 18-KS.

Table 3.5 Differences between survey data and officially reported data on environmental investment expenditure, 1998, thousand Roubles

Media	PAC		Non-PAC		Addendum	Non-addendum	Total
	End of pipe	Process integrated	Resource mobilisation	Technological improvements			
Air	1,110			1,180			2,290
Water	22,000		5,240				27,240
Solid waste	2,710						2,710
Noise							
Other					4,230	50	4,280
Total	25,820		5,240	1,180	4,230	50	36,520

Source: Consultant's estimate.

The Addendum component consists mainly of land re-cultivation.

[5] Non-monetary transactions are estimated to constitute 100% of investment expenditure in the vodokanals in Novgorod See separate working paper regarding non-monetary transactions

Technological improvements

Technological investments with substantial environmental improvements were identified as part of the enterprise survey.

In the survey, enterprises were asked to report both environmental investments and other investments. The last question was included to enable the research team to assess possible environmental impact from other investments. However, the enterprises were reluctant to report other investments and reported almost solely environmental investments. Only a few other investments were reported. These other investments (hereafter called "technological improvements") are described in this subsection.

The technological investments, with significant environmental improvements, in both regions are relatively homogeneous and comprise conversion into natural gas from different types of fuel: coal or mazut of power plants of different capacity: local boilers or heating power plants.

Table 3.6 Investments with environmental impact, thousand Roubles

Investment type	Sector	Enterprise	Investment expenditure			
			1995	1996	1997	1998
Fuel conversion from coal to natural gas	Public utility	Chiudovo “Municipal services”	0	0	0	300
Fuel conversion from mazut to natural gas	Vodokanal	“Novzjilcommun-service"	0	108	1,189	880
Total investment expenditure			18	108	1,189	1,180

Source: Consultant’s estimate.

The environmental impact for all the above-mentioned types of technological improvements differs only in scale. The emission reduction refers to CO, CO_2, SO_2, particulate matters, and vanadium dioxide when converting from mazut.

Table 3.7 Environmental impact

Investment type	Category of environmental impact
Fuel conversion from coal to gas in the boiler room	Reduction of CO, CO_2, SO_2 emissions and particulates matters
Fuel conversion from mazut to gas in the boiler room	Reduction of CO, CO_2, SO_2 emissions, particulate matters and vanadium dioxide

Source: Consultant’s estimate.

These investments were clearly carried out for technical/commercial reasons. However, since this is one of the major ways to reduce air pollution one could argue that all the investment expenditure can be seen as an environmental expenditure. Therefore these investment expenditure was included in the non-

PAC category with the total environmental expenditure. In the following table the technological investment expenditure is broken down by sectors.

Table 3.8 Environmental investment expenditure in "Technological investments"

	Non-PAC expenditure
Vodokanals	880
District heating	300
Municipal solid waste services	0
Others (natural gas industry, power supply)	0
Business sector	0

Source: Consultant's estimate.

3.1.2 Current expenditure

Official data

The form 4-OS provided subtotals for current expenditure for the following media: water, air, solid waste and land. Table3.9 shows an overview of current expenditure by media and sector in 1998.

Table 3.9 Official data on environmental current expenditure by sector and media based on 4 -OS, 1998, thousand Roubles

			Air	Water	Solid waste	Noise	Other	Total
Public sector		Regional authorities						
		Local authorities						
Public utilities		Vodokanals	20	52,940	-		-	52,960
		District heating & other PU	1,560	6,070	180		-	7,810
		Municipal solid waste services	-	-	-		-	-
Business sector								
Rus	ISIC	Total	15,340	48,070	20,680		270	84,370
5	15	Food, beverages, tobacco	160	4,460	100		-	4,720
6	17	Textiles, leather	60	490	-		-	550
7	20	Wood, wood products	100	5,480	480		-	6,060
8	21	Pulp, paper, printing	-	1,010	10		-	1,020
9	24, 25	Chemicals, rubber, plastic	11,080	17,220	18,250		-	46,550
10	23	Refineries	-	-	-		-	-
11	26	Non-metallic mineral products	20	320	20		50	410
12	27	Basic metals	1,830	4,300	50		30	6,210
13	28-35	Metal products, machinery	1,230	7,590	480		-	9,300
14	36-37	Other	430	2,760	90		-	3,280
5–14			14,910	43,620	19,480		80	78,090
15	01-05	Agriculture, hunting, fishing, etc.	40	170	-		-	210
16	10-14	Mining, Quarrying	90	-	-		-	90
17–19		Construction, transport, other	310	4,280	1,200		190	5,990
Total			16,920	107,080	20,860		270	145,140

Source: Form 4-OS
Spreadsheet: for_annex_PACoutline_nvg_en_29m.xls (current_official_media)
Note: Due to rounding, the totals might deviate from the sum that can be calculated based on the figures in the table.

The shaded fields in the table indicate that the data is not officially available (not reported in form 4-OS). Land re-cultivation is included in the category "other". Resource mobilisation is covered partly in current expenditure for water protection but it is not possible to break this component down. The data on current expenditure in form 4-OS includes user fees for wastewater treatment and solid waste disposal. When the current expenditure was calculated according to the OECD PAC expenditure methodology abater principle, these fees were deducted to avoid double counting.

A comparison of the current expenditure in Table 3.9 with the investment expenditure from Table 3.2 clearly shows that current expenditure constitutes the major share of environmental expenditure in Novgorod.

As seen from Table 3.9, municipal solid waste management enterprises do not report using form 4-OS even though they do provide pure environmental services. The reason for this is that they do not pay pollution charges or user fees and have no environmental fixed assets - therefore, they are not obliged to fill in form 4-OS.

District heating is only represented by those enterprises that consume heat and most of their environmental expenditure refers to the Novgorodskaya power plant. Since district heating is very common in the Novgorod oblast, this undercoverage is very evident.

All enterprises providing wastewater services in the Novgorod oblast filled in form 4-OS in 1998, but not during the period 1995 to 1997.

Finally, it should be mentioned that current expenditure for water supply is not covered in official reporting.

Survey data

Similar to the investment expenditure, total current expenditure is calculated based on official data from the reporting form 4-OS, adding expenditure from the sample questionnaire data that was not already reported in form 4-OS. These calculations are shown in Table 3.10.

Public sector data is included from questionnaires filled in by resource committees and environmental committees at oblast and local levels, and includes management and monitoring costs. Administrations have no environment protection departments, meaning that their administration cost is zero (the "Municipal customer service" enterprises are treated separately). Administrations reported the current expenditure on tree planting along the streets with heavy traffic. This expenditure (1.247.000 Roubles in 1998) was included in air protection, under the category end-of-pipe expenditure. The reason why tree planting is included here is that the administrations clearly stated that trees are planted to reduce air pollution.

Table 3.10 Elements in calculating revised environmental current expenditure, thousand Roubles

			Expenditure according to 4 OS	Added from enterprises questionnaires current expenditure	Added from enterprises questionnaires R&D expenditure	Estimated on the base of vodokanal expenditure	Estimated on the basis of oblast consolidated budget report	Added from administration questionnaires, resource and ecological committees questionnaires	Total
Public sector		Regional authorities		-	-			57,370	57,370
		Local authorities		-	-			3,260	3,260
Public utilities		Vodokanals	52,960	10,560	50	96,770			160,340
		District heating & other PU	3,470	2,030	-				5,500
		Municipal solid waste services		460	-		4,500		4,960
Business sector									-
Rus	ISIC	Total	66,320	23,260	400				89,980
5	15	Food, beverages, tobacco	1,840	420	20				2,280
6	17	Textiles, leather	520						520
7	20	Wood, wood products	2,390		130				2,520
8	21	Pulp, paper, printing	1,020						1,020
9	24, 25	Chemicals, rubber, plastic	46,330	22,850	140				69,320
10	23	Refineries							-
11	26	Non-metallic mineral prod.	80						80
12	27	Basic metals	4,330						4,330
13	28-35	Metal products, machinery	5,530		100				5,630
14	36-37	Other	920						920
5–14			62,960	23,260	400				86,620
15	01-05	Agriculture, hunting, fishing, etc.	180						180
16	10-14	Mining, quarrying	90						90
17–19		Construction, transport, other	3,100						3,100
Total			122,750	36,310	450	96,770	4,500	60,630	321,410

Source: Consultant's estimate.

Spreadsheet: Novgorod calculations (Novgorod_Current_98).

Note: The column "Expenditure according to 4 OS" does not match the figures in Table 3.9 due to exclusion of user fees. Due to rounding, the totals might deviate from the sum that can be calculated based on the figures in the table.

Table 3.11 shows total current expenditure broken down by sector and media.

Table 3.11 Survey data on environmental current expenditure by sector and media, 1998, thousand Roubles

			Air	Water	Solid waste	Noise	Other	Total
Public sector		Regional authorities	870	1,310	60		55,140	57,370
		Local authorities	1,390	140	60		1,670	3,260
Public utilities		Vodokanals	40	157,050	3,200		50	160,340
		District heating & other PU	2,130	3,150	170		50	5,500
		Municipal solid waste services	0	0	4,770		190	4,960
Business sector								
Rus	ISIC	Total	24,220	43,660	21,420	10	670	89,980
5	15	Manufacturing	23,790	41,170	21,180	10	480	86,630
15	01-05	Agriculture, hunting, fishing, etc.	40	140	0		0	180
16	10-14	Mining, quarrying	90	0	0		0	90
17–19		Construction, transport, other	310	2,350	240		190	3,090
Total			28,650	205,310	29,680	10	57,770	321,410

Source: Form 4-OS, enterprises questionnaires, Land, Forest, Water, Fish, Hunting, Hydro-meteorological resource committees.

Spreadsheet: for_annex_PACoutline_nvg_en_29m.xls (Current_survey_media)

Notes: Due to rounding, the totals might deviate from the sum that can be calculated based on the figures in the table. Figures are given in book values. i.e. there has been made no correction for overestimation due to non-monetary transactions.

The figures in Table 3.11 have not been corrected for non-monetary transactions. Assuming an overestimation of 30% resulting from non-monetary transactions[6] at the vodokanals, the overestimation of total current expenditure would amount to 34,152,000 Roubles.

In the enterprise sample questionnaire, noise abatement expenditure was only reported by one enterprise (Akron).

Table 3.12 illustrates the difference between the official data reported in form 4-OS and the new results from this survey. There are two general effects when shifting from the Russian approach to the OECD abater approach:

- The re-assessment of current expenditure typically leads to higher expenditure (this is especially the case for vodokanals and public sector, but also for some enterprises in the business sector).

[6] Non-monetary transactions are estimated to constitute 71% of current expenditure in the vodokanals in Novgorod. See separate working paper regarding non-monetary transactions

- Deducting the user fees reduces the OECD abater expenditure in enterprises with high levels of user fees. This is the explanation for the negative figures in the following table.

Table 3.12 Differences between survey data and officially reported data on environmental current expenditure, 1998, thousand Roubles

			Air	Water	Solid waste	Noise	Other	Total
Public sector		Regional authorities	870	1,310	60	0	55,140	57,380
		Local authorities	1,390	140	60	0	1,670	3,260
Public utilities		Vodokanals	20	104,110	3,200	0	50	107,380
		District heating & Other PU	570	-2,920	-10	0	50	-2,310
		Municipal solid waste services	0	0	4,770	0	190	4,960
Business sector								
Rus	ISIC	Total	8,880	-4,410	740	10	400	5,610
5	15	Manufacturing	8,880	-2,450	1,700	10	400	8,540
15	01-05	Agriculture, hunting, fishing, etc.	0	-30	0	0	0	-30
16	10-14	Mining, Quarrying	0	0	0	0	0	0
17–19		Construction, transport, Other	0	-1,930	-960	0	0	-2,900
Total			11,730	98,230	8,820	10	57,500	176,280

Source: Consultant's estimate.

As seen from the table above, current expenditure increases by 176,280 thousand Roubles per year due to the new data collection and the more broad definition of environmental expenditure.

The major reason for the difference is the inclusion of water supply in the category resource mobilisation which accounts for more than half (approximately 100,000 thousand Roubles) of this difference.

3.2 Environmental expenditure - financing principle

The environmental expenditure calculated by financing principle is calculated from the abater principle and corrected by the financial transfers between sectors. The financial transfers are shown in the following table.

Table 3.13 Financial transfers between sectors, 1998, thousand Roubles.

	Resource taxes, from utilities and business to public budget	Pollution charges from utilities and business to public budget	Exemptions on pollution charges	User fees (water) to utilities from business	Subsidies, from public budget to utility and business	Correction to obtain financial principle
Correction to obtain financial principle	-	-	+	+	+	
Federal budget		670			680	10
Regional budget	4,510				16,370	11,860
Local budget	34,430				81,740	47,310
Federal environmental fund		200			-	- 200
Regional environmental fund		1,480	260		260	- 960
Local environmental fund		2,610	1,050		1,350	- 210
Other sources					170	170
Total public sector	38,950	4,960	1,310		100,560	57,960
	+	+	-	-	-	
Vodokanals	860	810	590	20,490	91,070	- 110,480
District heating & other PU	8,160	690	210		20	8,620
Municipal solid waste services	-	6,920	-	1,890	5,580	- 550
Utilities total	-	6,920	-	1,890	5,580	- 102,410
	+	+	-	+	-	
Business	37,120	10,090	510	18,050	1,300	63,450
Households				63,940		
Private sector	37,120	10,090	510	81,990	1,300	63,450

Sources: Form 4-OS, administration questionnaires, environmental committee questionnaire, enterprise questionnaires.

Note: Due to data problems taxes and charges paid to public budget by enterprises and utilities do not balance with budget information on taxes and charges received by public budget. This is due to different data sources. Household user fees to vodokanals are calculated as the residual of total vodokanal expenditure after deducting government funds and business sector funds.

The table shows the corrections necessary to obtain the environmental expenditure according to the financing principle - who is paying the environmental expenditure.

The shaded fields show how the transfers affect the environmental expenditure for this component. As an example one could mention resource taxes: in the business sector this column begins with a "+" meaning that these resource taxes from the business sector should be added to the abater expenditure when

we wish to calculate environmental expenditure according to the financing principle for the business sector. The counterpart to this correction is of course a reduction in the public sector receiving the resource taxes. The environmental expenditure calculated according to the financing principle is shown in the following table.

Table 3.14 Environmental expenditure according to the financing principle

Sector	Abater principle expenditure EE I	Public awareness	Financial transfers	Financing principle expenditure EE II
Federal budget	0		-190	-190
Regional budget	61,900		10,890	72,790
Local budget	9,350		47,270	56,620
Total public sector	71,250	170	57,960	129,390
Vodokanals	174,410		-174,410	0
District heating & other PU	6,010		8,630	14,640
Municipal solid waste services	5,850		-560	5,300
Total utilities	186,270		-166,340	19,940
Business sector	111,440		63,450	174,890
Households	0		63,940	63,940
Total private sector	111,440		127,390	238,830
Total expenditure	368,970		19,010	388,150

Source: Consultant's estimate.

Note: It was not possible to identify the implementing enterprises for awareness measures. Therefore, this expenditure is not included on the abater side. Figures are given in book values. i.e. there has been made no significant correction for overestimation due to non-monetary transactions. Assuming an overestimation of 30% for investment expenditure and 30% for current expenditure at the vodokanals the non-monetary overestimation would amount to 38,349 thousand Roubles.

Comparing abater expenditure with financing expenditure reveals a difference of approximately 19 millions Roubles. This difference is due to data problems in calculating financial transfers. These data problems do not affect the main conclusion that environmental expenditure for vodokanals is significantly less according to the financing principle relative to the abater principle, while the opposite is true for business sector and public sector.

3.3 Comparative analyses

This section compares the three alternative methods of environmental expenditure in Novgorod:

- PAC/non-PAC according to the abater principle,
- PAC/non-PAC according to the financing principle and
- the official Russian method)

Furthermore, this section suggests possible explanations for the identified differences.

A few general conclusions should be mentioned:

For the *business sector* enterprise, environmental expenditure according to the abater principle can be lower than reported in forms 18-KS and 4-OS, even if the PAC/non-PAC methodologies, to some extent, uses a broader definition of the environmental expenditure. This is due to the mix in the Russian approach of the abater and financing principle (form 4-OS includes some user charges). The deviation depends on the amount of user charges paid by the enterprise. On the other hand, the PAC/non-PAC expenditure would typically be higher than the Russian approach, since the PAC/non-PAC approach implies a broader definition than the Russian approach and because the Russian approach leaves out some important elements. (e.g. the municipal customer service enterprises, which is not reported in official statistics).

For *vodokanals* the total abater expenditure should be higher than official Russian data due to the inclusion of water supply investment and current expenditure (non-PAC). According to the financing principle, the environmental expenditure may be lower than the official Russian method due to the user fees that are subtracted from the vodokanal expenditure according to the financing principle.

The major conclusion is that environmental expenditure calculated from the PAC/non-PAC expenditure methodology is more than twice as high as officially reported environmental expenditure.

Furthermore, there is a minor difference between the abater and the financing approach. As mentioned earlier this difference is due to data problems calculating financial transfers.

Table 3.15 Discrepancy between environmental expenditure calculated by Russian and PAC/non-PAC methodologies (thousand Roubles)

	1995	1996	1997	1998
PAC/non-PAC – Abater	176,880	470,440	379,730	368,970
PAC/non-PAC – Financing	186,650	468,140	360,350	386,230
Russian	119,270	216,180	196,910	156,180
Abater expenditure per capita (rubles)	240	640	510	500
Abater expenditure share in GRP %	4%	7%	5%	4%
Financing expenditure per capita (rubles)	250	630	490	530
Financing expenditure share in GRP %	4%	7%	5%	4%
Russian exp. per capita (rubles)	160	290	270	210
Russian exp. share in GRP %	3%	3%	3%	2%

Source: Consultant's estimate.

3.4 Case study

The previous sections show the aggregate expenditure for the whole oblast. In order to illuminate differences between Russian and the PAC/non-PAC methodologies at the enterprise level, two case studies were carried out, one in Novgorod and one in Pskov. The following section describes a case study that was carried out at the chemical manufacturing enterprise "Akron" in Novgorod.

Akron is a joint stock company with foreign capital investments. It is the biggest chemical enterprise (91.9% of total chemical production) in the Novgorod oblast located in Veliky Novgorod city and employs more than 6000 people. The major products are ammonia, mineral fertilisers and organic products. 80% of this production is exported.

Akron has reduced the emissions to the atmosphere by 5-6 times in recent years, but remains one of the biggest polluters in the oblast, emitting 10% of all oblast emissions in 1998. Furthermore, because Akron operates the biological treatment plant belonging to the city, the enterprise stands for 65% of all discharged wastewater in the region.

Since wastewater treatment is not the main activity of the enterprise, the revenues received from customers are considered receipts in the OECD PAC expenditure methodology and are deducted from the environmental expenditure when calculating the environmental expenditure according to the abater principle.

For Akron, the environmental expenditure from the new survey exceeds officially reported expenditure by 44% - 71% for different years. The main reasons for this deviation is:

- Not reflected in form 4-OS:
  biological WWT O&M cost;
  Noise protection measures;
  Land protection measures;
  Laboratory work;
  Some pre-treatment current expenditure;

- Not all the investments made are reflected in form 18-KS (in 1998 investments for air protection, rational use of land resources, solid waste disposal were not included in official report).

- In general one can say that when filling in the COWI questionnaire enterprises paid more attention to including environmental expenditure made than when they reported to oblstat[7].

All in all, applying the PAC/non-PAC methodology results in significant increases in the environmental expenditure, which is mainly due to inclusion of expenditure not included in the official reporting form 4-OS.

[7] Having foreign owners Akron is not obliged to present the 18-KS report

4 Results from Pskov Oblast

The purpose of this chapter is to present the results from the data collection in Pskov oblast. The presentation focuses on 1998 figures, which are the latest available. Results from 1995 - 1997 are shown in Annex III.

It should be noted that the figures in the tables are given in book values, i.e. they are not corrected for overestimation due to non-monetary transactions[8]. Rough estimations of non-monetary overestimation is given after Table 4.4 for investment expenditure and Table 4.11 for current expenditure.

Water recycling investments

In this report water recycling investments are categorised under the category "resource mobilisation". However, because water savings also reduce the demand for wastewater treatment these investments could also be categorised under end-of-pipe investments. In the SERIEE classification (page 109 SERIEE 1994 version), investments for water recycling are included in the management of waste water activities and therefore considered as PAC investment expenditure. Table 4.1 shows the water recycling investment expenditure for the years 1995 to 1998.

Table 4.1 Water recycling investments, 1995 to 1998, thousand Roubles

	Official	Survey
1995	70	130
1996	0	0
1997	0	70
1998	250	70

Source: Consultant's estimate.

4.1 Environmental expenditure - abater principle

4.1.1 Investment expenditure

The main source for analysing officially reported investment expenditure data is form 18-KS. The data from form 18-KS are supplemented by sample survey

[8] In the survey data tables there has been made some minor corrections based on enterprise interview data. However, these corrections are far from sufficient.

data and data reported by resource committees and administrations. Both official (form 18-KS) and surveyed investment expenditure is broken down by type of expenditure (PAC/ non-PAC, etc.). Finally, the difference between surveyed and official data is calculated and main sources of discrepancies are discussed.

Existing data

Form 18-KS was converted by the project team together with the oblstats and oblast environmental committees. The result from this work is shown in Table 4.2.

Table 4.2 Official data on environmental investment expenditure by media and type of expenditure, 1998, thousand Roubles

Media	PAC		Non-PAC		Addendum	Non addendum	Total
	End of pipe	Process integrated	Resource mobilisation	Technological improvements			
Air	10,670	0	0	0	0	0	10,670
Water	4,450	0	250	0	0	0	4,690
Solid waste	950	0	0	0	0	0	950
Noise							
Other	0	0	0	0	0	0	0
Total	16,070	0	250	0	0	0	16,310

Source: form 18-KS
Spreadsheet: Inv_by_media_official.xls

Detailed tables showing the results from converting form 18-KS to the OECD PAC expenditure methodology, non-PAC and Addendum, segmented after media are presented in Annex III.

Form 18-KS mostly end-of-pipe investments

Most of the lines in form 18-KS describe end-of-pipe investments. Process integrated technologies cannot be identified using form 18-KS, which is why they are zero in this table. Resource mobilisation in the water sector mainly consists of investment expenditure for recycling systems.

The enterprises only reported investments for air, water and land protection and solid waste management. The statistical form does not require reporting of noise protection expenditure.

It should be noted that enterprises do not put much effort into filling in form 18-KS due to a lack of control from official authorities.

Surveyed data

As mentioned in chapter 2, environmental expenditure according to the abater principle has been calculated with many different data sources. The elements in these calculations are shown in Table 4.3.

Table 4.3 Elements in calculating revised environmental investment expenditure, thousand Roubles

			Expenditure according to 18 KS	Added from resource committee questionaires	Added from REF & LEF questionnaires (REF &LEF expenditure)	Added from REF & LEF questionnaires (pollution charges exemptions)	Estimated on the base of Consolidated Oblast budget performance report	Added from enterprises quiestionnaires	Total
Public sector		Federal authorities	0	0	0	0	0	0	0
		Regional authorities	0	3,610	750	0	160	0	4,520
		Local authorities	0	0	0	0	0	1,530	1,530
Public utilities		Vodokanals	340	0	60	520	1,970	1,230	4,130
		District heat. & other PU	680	0	0	20	0	590	1,300
		Municipal solid waste services	0	0	0	60	0	0	60
Business sector									
Rus	ISIC	Total	15,290	0	70	110	0	8,600	24,070
5	15	Food, beverages, tobacco	0	0	0	0	0	30	30
13	28-35	Metal prod., machinery	290	0	0	0	0	6,780	7,070
14	36-37	Other	1,650	0	0	0	0	0	1,650
15	01-05	Agri., hunting, fishing.	780	0	10	0	0	1,430	2,220
17–19		Construction, transport	12,570	0	60	110	0	270	13,010
Total			16,310	3,610	880	710	2,130	11,960	35,610

Spreadsheet: EE_data_reply(Pskov Investment 1998).

All selected enterprises in the Pskov oblast filled in and returned the questionnaires.

Public sector abaters added

Since the public sector does not report information on expenditure using form18-KS, all abater investment expenditure within the public sector is added to the official data from form 18-KS. Information on these investments was obtained from the resource committee questionnaires (mostly forestry, hunting and water), and municipal customer services. Furthermore, two nature protection areas were included in the survey, even though they did not fill in form 18-KS.

Table 4.4 shows the total environmental investment expenditure grouped by media and PAC, non-PAC and Addendum.

Table 4.4 Survey data on environmental investment expenditure by media and type of expenditure, thousand Roubles, 1998

Media	PAC		Non-PAC		Addendum	Non-addendum	Total
	End of pipe	Process integrated	Resource mobilisation	Technological investments			
Air	1,450	0	0	13,260	0	0	14,710
Water	8,380	0	220	70	0	0	8,670
Solid waste	1,680	0	0	0	0	0	1,680
Noise							
Other	0	0	110	0	7,090	370	7,570
Total	11,460	0	320	13,330	7,090	370	32,630

Source: Form 18-KS, administration, environmental committee, enterprises questionnaires, Land, Forest & Water resource committees

Spreadsheet: Inv_by_media_survey.xls

Note: Figures are given in book values. i.e. there has been made no significant correction for overestimation due to non-monetary transactions.

The figures in the table are reduced by 73 thousand Roubles to correct for over-estimation due to non-monetary transactions. However, only few enterprises were able to estimate the magnitude of the overestimation. Therefore, the over-estimation of 73 thousand Roubles far from represents all overestimation due to non-monetary transactions. Assuming an overestimation of 30%[9] of non-monetary vodokanals investment expenditure would reduce the figure with additionally 995 thousand Roubles.

Difference between form 18-KS and new data

The difference between surveyed and officially reported investments is presented in Table 4.5 (subtracting Table 4.2 from Table 4.4). The major source of the differences between officially reported expenditure and the survey data is the inclusion of some technological investment expenditure - conversion to natural gas. Furthermore, the surveyed investment expenditure is greater due to the non-coverage by official reporting.

Some of the minor differences refer to the re-evaluation of investments made and assignment of the investments to the different expenditure types in comparison to form 18-KS. For example, the negative figure in end-of-pipe/air is due to re-evaluation and subsequent transfer of this expenditure component from end-of-pipe to technological improvements.

Only one process-integrated technology was identified in the solid waste sector, namely improvement of concealment technology at municipal solid waste landfills to reduce soil pollution.

The negative figure in resource mobilisation/water is due to the clarification of investment and its transfer to the end-of pipe category.

[9] Non-monetary transactions are estimated to constitute 83% of investment expenditure in the vodokanals in Pskov. See separate working paper regarding non-monetary transactions

The addendum includes the investment expenditure in rehabilitation in two protected areas. This expenditure was not reported in form 18-KS this year (1998), but it was reported in the enterprise sample questionnaire.

Table 4.5 Differences between survey data and officially reported data on environmental investment expenditure, 1998, thousand Roubles

Media	PAC		Non-PAC		Addendum	Non-addendum	Total
	End of pipe	Process integrated	Resource mobilisation	Technological improvements			
Air	-9,220	0	0	13,260	0	0	4,040
Water	3,930	0	-30	70	0	0	3,970
Solid waste	730	0	0	0	0	0	730
Noise	0	0	0	0	0	0	0
Other	0	0	110	0	7,090	370	7,570
Total	-4,550	0	70	13,330	7,090	370	16,310

Source: Consultant's estimate.

Technological improvements

In the survey, enterprises were asked to report both environmental investments and other investments. The last question was included to enable the research team to assess any possible environmental impact from other investments. However, the enterprises were reluctant to report other investments and reported almost solely environmental investments. Only a few other investments were reported. These other investments (hereafter called "technological improvements") are described in this subsection.

The technological improvements in Pskov are relatively homogeneous and comprise conversion to natural gas from coal and mazut in power plants. The description of typical technological improvements is presented in the following tables.

Pskovcabel introduced new technology to reduce operating costs and discharges of heavy metals. This technology uses new environmentally cleaner material for cable production.

Table 4.6 Investments with environmental impact, thousand Roubles

Investment type	Enterprise	Media	Investment expenditure			
			1995	1996	1997	1998
Fuel conversion from coal to gas in the boiler room	1Vodokanal Velikiye Luky	Air	90	210	160	170
	4 Heating network –Velikiye Luky	Air	530	110	320	980
	13 OJSC “Elterm”	Air	640	260	390	120
	18 Locomotive depot – Velikiye Luky	Air	2,490	1,970	140	330
Fuel conversion from coal to gas in the power station	13 OJSC “LRZ”	Air	1,900	6,740	1,950	350
Whiten wire rod	13 OJSC “Pskovkabel”	Water	10	20	0	0
Total			5,650	9,310	2,960	1,940

Source: Consultant’s estimate.

Table 4.7 Typical environmental impact

Investment type	Category of environmental impact
Conversion to new type of materials when producing cable	Reduction of discharges of heavy metals
Fuel conversion from coal to gas in the boiler room	Reduction of CO, CO_2 and CH_X emissions

Source: Consultant’s estimate.

The investments were carried out for technical/commercial reasons. However, since the fuel conversion is one of the major ways to reduce air pollution one could argue that all the investment expenditure could be seen as an environmental expenditure. Therefore this investment expenditure was included in the non-PAC category with the total investment expenditure. The new cable production technology is also considered to have significant environmental impact, and the investment expenditure for this investment was also included.

In the following table the technological investment expenditure are broken down by sectors.

Table 4.8 Environmental investment expenditure in "Technological investments" 1998

	Non-PAC expenditure
Vodokanals	170
District heating	1,100
Municipal solid waste services	
Others (natural gas industry, power supply)	350
Business sector	330

Source: Consultant's estimate.

4.1.2 Current expenditure

Official data

Form 4-OS provides subtotals for current expenditure for the following media: water, air, solid waste and land. Table 4.9 shows an overview of current expenditure by media and sector in 1998.

Table 4.9 Official data on environmental current expenditure by sector and media based on 4 -OS, 1998, thousand Roubles

			Air	Water	Solid waste	Noise	Other	Total
Public sector		Regional authorities						
		Local authorities						
Public utilities		Vodokanals	-	40,700	240		-	40,950
		District heating & other PU	450	230	40		-	710
		Municipal solid waste services	-	-	-		-	-
Business sector								
Rus	ISIC	Total	2,290	19,820	1,500		930	24,540
5	15	Food, beverages, tobacco	20	1,070	150		-	1,240
6	17	Textiles, leather	10	990	20		-	1,010
7	20	Wood, wood products	70	620	10		-	700
8	21	Pulp, paper, printing	-	250	-		-	250
9	24, 25	Chemicals, rubber, plastic	-	-	-		-	-
10	23	Refineries	-	-	-		-	-
11	26	Non-metallic mineral products	70	120	-		50	240
12	27	Basic metals	-	-	-		-	-
13	28-35	Metal products, machinery	1,300	11,050	160		20	12,530
14	36-37	Other	70	210	60		-	350
5 – 14		Subtotal	1,540	14,310	410		70	16,320
15	01-05	Agriculture, hunting, fishing, etc.	-	-	-		-	-
16	10-14	Mining, quarrying	-	-	-		-	-
17 – 19		Construction, transport, other	750	5,510	1,090		860	8,220
Total			2,740	60,760	1,780	-	930	66,210

Source: Form 4-OS (Spreadsheet: Cur_official_by_media_sector_new!.xls)

The shaded fields in the table indicate that data is not officially available (not reported in form 4-OS). Land re-cultivation is included in the category “other”. Resource mobilisation is covered partly in current expenditure for water protection but it is not possible to break this component down. The current expenditure, reported in form 4-OS, includes user fees for wastewater treatment and solid waste disposal. When the current expenditure was calculated according to the abater principle, these fees were deducted to avoid double counting.

Comparing the current expenditure in Table 4.9 with the investment expenditure from Table 4.2 clearly shows that the current expenditure constitutes the major share of environmental expenditure in Pskov.

As can be seen from Table 4.9, solid waste management enterprises do not used form 4-OS to report data, even though they do provide pure environmental

services. The reason for this is that they do not pay pollution charges or user fees and have no environmental fixed assets - therefore, they are not obliged to fill in form 4-OS.

Furthermore, district heating is only represented in the official data in cases where the service is provided by an enterprise with another main purpose, using form 4-OS to report other activities. Therefore the environmental expenditure for district heating is very low in official data. Since district heating is very common, this under-coverage in the official reported data is evident.

Survey data

Similar to the investment data, the total current expenditure is calculated based on official data from the reporting form 4-OS with the addition of data on environmental expenditure obtained from other sources. Public sector data is included from questionnaires filled in by resource committees and environmental committees at oblast and local levels, and includes management and monitoring costs. Administrations have no environment protection departments, meaning that their administration cost is zero (the "Municipal customer service" enterprises are treated separately). Administrations reported the current expenditure on tree planting along the streets with heavy traffic. This expenditure (122.000 Roubles in 1998) was included in air protection, under the category end-of-pipe expenditure. The reason why tree planting is included here is that trees are planted to reduce air pollution.

Table 4.10 shows how the new total current expenditure has been calculated from the different data sources.

Table 4.10 Elements in calculating revised environmental current expenditure, thousand Roubles

			Expenditure according to 4- OS	Added from enterprises questionnaires	Added from administration questionnaires, resource and ecological committees questionnaires	Estimated on the base of vodokanal expenditure	Total
Public sector		Regional authorities		-	36,730		36,730
		Local authorities		1,230	2,640		3,870
Public utilities		Vodokanals	40,750	20,170		61,580	122,500
		District heating & other PU	690	530			1,220
		Municipal solid waste services	-	-			
Business sector							
Rus	ISIC	Total	13,960	1,750			15,710
5	15	Food, beverages, tobacco	510	40			550
6	17	Textiles, leather	60	-			60
7	20	Wood, wood products	90	-			90
8	21	Pulp, paper, printing	-	-			-
9	24, 25	Chemicals, rubber, plastic	-	-			-
10	23	Refineries	-	-			-
11	26	Non-metallic mineral prod.	220	370			590
12	27	Basic metals	-	-			-
13	28-35	Metal products, machinery	7,030	1,160			8,180
14	36-37	Other	130	40			170
5 – 14			8,030	1,600			9,640
15	01-05	Agriculture, hunting, fishing, etc.	-	80			80
16	10-14	Mining, quarrying	-	-			-
17 – 19		Construction, transport, other	5,930	70			5,990
Total			55,400	23,680	39,370	61,580	180,040

Source: Consultant's estimate.

Spreadsheet: EE_data_reply(Pskov current 1998)

Note: The column "Expenditure ac-cording to 4 OS" does not match the figures in Table 4.9 due to exclusion of user fees. 340 thousand roubles were deducted to corrected for non-monetary transactions. Note: Figures are given in book values. i.e. there has been made no significant correction for overestimation due to non-monetary transactions.

The figures in the table are reduced by 340 thousand Roubles to correct for overestimation due to non-monetary transactions. However, only few enterprises were able to estimate the magnitude of the overestimation. Therefore, the

overestimation of 340 thousand Roubles far from represents all overestimation due to non-monetary transactions. Assuming an overestimation of 38% resulting from non-monetary transactions[10] at the vodokanals, the overestimation of total current expenditure would amount to additionally 39,228 Roubles.

Table 4.11 shows the new current expenditure in 1998, broken down by media and sector. The most significant element in this table is the water sector, accounting for more than half of total current expenditure.

Table 4.11 Survey data on environmental current expenditure by sector and media, 1998, thousand Roubles

			Air	Water	Solid waste	Noise	Other	Total
Public sector		Regional authorities	150	430	1,150		35,010	36,730
		Local authorities	660	540	540		2,130	3,870
Public utilities		Vodokanals	9,330	112,890	290		0	122,500
		District heating & other PU	770	360	40		50	1,220
		Municipal solid waste services	0	0	0		0	0
Business sector								
Rus	ISIC	Total	2,460	8,370	1,300	0	3,580	15,720
5	15	Manufacturing	1,840	4,840	260	0	2,700	9,640
15	01-05	Agriculture, hunting, fishing, etc.	0	80	0		0	80
16	10-14	Mining, quarrying	0	0	0		0	0
17– 9		Construction, transport, other	620	3,460	1,050		880	6,000
Total			13,370	122,590	3,320	0	40,770	180,040

Source: Form 4-OS, enterprises questionnaires, Land, Forest, Water, Fish, Hunting, Hydro-meteorological resource committees.

Spreadsheet: Cur_survey_by_media_sector.xls

Table 4.12 illustrates the difference between the official data from form 4-OS and the new results from this survey. There are two general effects when shifting from the Russian approach to the PAC/non-PAC abater principle:

- The re-assessment of current expenditure typically leads to higher expenditure (this is especially the case for vodokanals and public sector, but also for some enterprises in the business sector).
- Deducting the user fees reduces the expenditure in enterprises with high level of user fees. This is the reason for the negative figures in the following table.

[10] Non-monetary transactions are estimated to constitute 85% of current expenditure in the vodokanals in Pskov. See separate working paper regarding non-monetary transactions

Table 4.12 Differences between survey data and officially reported data on environmental current expenditure, 1998, thousand Roubles

			Air	Water	Solid waste	Noise	Other	Total
Public sector		Regional authorities	150	430	1,150	0	35,010	36,730
		Local authorities	660	540	540	0	2,130	3,870
Public utilities		Vodokanals	9,320	72,180	40	0	0	81,550
		District heating & other PU	320	130	10	0	50	510
		Municipal solid waste services	0	0	0	0	0	0
Business sector								
Rus	ISIC	Total	170	-11,450	-200	0	2,650	-8,830
5	15	Manufacturing	300	-9,480	-150	0	2,640	-6,690
15	01-05	Agriculture, hunting, fishing, etc.	0	80	0	0	0	80
16	10-14	Mining, quarrying	0	0	0	0	0	0
17 – 19		Construction, transport, other	-140	-2,060	-50	0	10	-2,220
Total			10,620	61,830	1,540	0	39,830	113,820

Source: Consultant's estimate.

As can be seen from the table above, current expenditure increases by 113,820 thousand Roubles per year due to the new data collection and the broader definition of environmental expenditure.

The major reason for the difference is the inclusion of water supply data in the category resource mobilisation which accounts for more than half (approximately 72,000 thousand Roubles) of this difference.

4.2 Environmental expenditure - financing principle

The environmental expenditure calculated according to the financing principle is calculated from the abater principle and corrected by the financial transfers between sectors. The financial transfers are shown in the following table.

Table 4.13 Financial transfers between sectors, 1998, thousand Roubles

	Resource taxes, from utilities and business to public budget	Pollution charges from utilities and business to public budget	Exemptions on pollution charges	User fees (water) to utilities from private sector	Subsidies, from public budget to utility and business	Correction to obtain financial principle
Correction to obtain financial principle	-	-	+	+	+	
Federal budget		480			190	-280
Regional budget	8,390				2,310	-6,080
Local budget	38,200				36,640	-1,570
Federal environmental fund		190			-	-190
Regional environmental fund		2,050	710		140	-1,200
Local environmental fund		-	-		-	-
Other sources					2,430	2,430
Tota public sector	46,590	2,720	710		41,700	-6,890
	+	+	-	-	-	
Vodokanals	2,350	110	520	10,060	33,860	-41,980
District heating & Other PU	50	60	20	20	2,280	-2,210
Municipal solid waste services	-	-	60	310	1,940	-2,310
Utilities total	2,410	170	600	10,390	38,080	- 46,500
	+	+	-	+	-	
Business	19,790	4,340	110	10,620	3,060	31,580
Households				84,650		84,650
Private sector	19,790	4,340	110	95,270	3,060	116,230

Sources: Form 4-OS, administration questionnaires, environmental committee questionnaire, enterprise questionnaires.

Spreadsheet: Financial_transfers.xls

Note: Due to data problems taxes and charges paid to public budget by enterprises and utilities do not balance with budget information on taxes and charges received by public budget. This is due to different data sources. Household user fees to vodokanals are calculated as the residual of total vodokanal expenditure after deducting government funds and business sector funds.

The table shows the corrections necessary to obtain the environmental expenditure according to the financing principle - who is paying the environmental expenditure.

The shaded fields show how the transfers affect the environmental expenditure for this component. As an example, one could mention resource taxes: in the business sector this column starts with a "+" meaning that these resource taxes from the business sector should be added to the abater expenditure when calculating environmental expenditure according to the financing principle for the

business sector. The counterpart to this correction is of course a reduction in the public sector receiving the resource taxes. The environmental expenditure calculated by the financing principle is shown in Table 4.14.

Table 4.14 Environmental expenditure according to the financing principle

Sector	Abater principle expenditure EE I	Public awareness	Financial transfers	Financing principle expenditure EE II
Federal budget	0	80	-470	-390
Regional budget	41,250		-7,280	33,980
Local budget	5,410		860	6,270
Total public sector	46,660	80	-6,890	39,850
Vodokanals	126,260		-126,260	
District heating & Other PU	2,520		-2,180	350
Municipal solid waste services	60		-1,650	-1,600
Total Utilities	128,840		-130,090	-1,250
Business sector	37,170		31,580	68,760
Households	0		84,290	84,290
Private sector	37,170		115,870	153,040
Total expenditure	212,670	80	-21,110	191,640

Source: Consultant's estimate.

Note: Awareness expenditure are not included on the abater side due to data problems. Figures are given in book values. i.e. there has been made no significant correction for overestimation due to non-monetary transactions. Assuming an overestimation of 30% for non-monetary investment expenditure and 38% for non-monetary current expenditure at the vodokanals the overestimation would amount to 40,183,000 Roubles.

Comparing abater expenditure with financing expenditure reveals a difference of approximately 21 millions Roubles. This difference is due to data problems in calculating financial transfers. These data problems do not affect the main conclusions that environmental expenditure for vodokanals is significantly less according to the financing principle relative to the abater principle, while the opposite is true for business sector and public sector.

4.3 Comparative analysis

This section compares the three alternative methods of environmental expenditure in Pskov (Abater, Financing and the official Russian method) and suggests possible explanations for the identified differences.

A few general conclusions should be mentioned:

For the *business sector* enterprise environmental expenditure according to the abated principle can be lower than reported in forms 18-KS and 4-OS even if

the PAC/non-PAC definition to some extent uses a broader definition of the environmental expenditure. This is due to the mix in the Russian approach of the abater and financing principle (form 4-OS includes some user charges). The deviation depends on the amount of user charges paid by the enterprise. On the other hand, the PAC/non-PAC environmental expenditure would typically be higher than the Russian approach, since the PAC-non-PAC approach implies a broader definition than the Russian approach and because the Russian approach leaves out some important elements (for instance municipal customer service enterprises, which is not reported in official statistics).

For *vodokanals* the total expenditure according to the abater principle should be higher than official Russian data due to inclusion of water supply investment and current expenditure (non-PAC). According to the financing principle, the expenditure will be lower than the official Russian method due to the user fees, which are subtracted from the vodokanal expenditure according to the financing principle.

The major conclusion is that environmental expenditure calculated according to the PAC/non-PAC expenditure methodology is more than twice as high as officially reported environmental expenditure.

Furthermore, there is a minor difference between the abater and the financing approach. Since the financing principle was calculated based on the abater expenditure, adjusting for financial transfers, this difference can only be due to unbalanced financial transfers.

Table 4.15 Discrepancy between EE calculated by Russian and OECD methodologies, thousand Roubles

	1995	1996	1997	1998
OECD – Abater	135,820	197,650	186,270	212,470
OECD – Financing	146,530	191,330	167,860	193,020
Russian	60,280	96,260	71,270	81,180
Abater/Russian	2.3	2.1	2.6	2.7
Abater expenditure per capita (rubles)	163	239	227	262
Abater expenditure share in GRP %	2.9%	3.4%	2.7%	2.3%
Financing/Russian	2.4	2.0	2.4	2.4
Financing expenditure per capita (rubles)	176	231	205	238
Financing expenditure share in GRP %	3.2%	3.3%	2.5%	2.1%
Russian exp. per capita (rubles)	72	116	87	100
Russian exp. share in GRP %	1.3%	1.7%	1.1%	0.9%

Source: Consultant's estimate.

4.4 Case study

Two types of case studies were carried out in connection with the survey in Pskov: one demonstrating the differences between using the Russian and the

PAC/non-PAC approach when calculating environmental expenditure of enterprises, the other demonstrating the use of pollution charge exemption. Only the first case study is described here. The pollution charge exemption case study is described in a separate paper describing non-monetary transactions.

The following subsection describes the case study on the comparison between official Russian data collection and the PAC/non-PAC approach for the locomotive repairing plant Velikie Luki in Pskov.

Locomotive repairing plant (Velikie Luki)

Enterprise description

Velikie Luki is a joint stock company located on 2 sites in Velikie Luki, the second biggest city in Pskov oblast. The enterprise employs approximately 1500 people. Its main activity is repair of electric and diesel trains, cement and mineral carrying trucks and different types of tank lorries, as well as production of mineral carrying trucks and spare parts.

Velikie Luki has a pre-treatment plant for galvanic discharges and porolone filters. All wastewater from the enterprise is discharged into the municipal sewerage system, i.e. the enterprise does not pay water pollution charges, but pays user fees to the vodokanal.

Velikie Luki pays air pollution and solid waste disposal charges. The toxic waste is accumulated on the territory of enterprise. It is transported and disposed on a regularly basis by a third party who is paid the user fee in the barter form. This expenditure is reflected in the survey questionnaire filled in by this enterprise.

The enterprise is in the process of implementing the conversion of power station from mazut to natural gas. The enterprise states that the main motive for this conversion is a reduction of operating costs (approximately 3 times lower than at present) and reductions in vanadium and CO_2 emissions.

Table 4.16 shows the environmental expenditure for this enterprise calculated according to the different approaches.

Table 4.16 Discrepancy between expenditure calculated by Russian and OECD methodologies, thousand Roubles

	1995	1996	1997	1998
Abater principle (PAC/non-PAC)	2,190	7,320	2,920	770
Financing principle (PAC/non-PAC)	4,330	11,280	6,460	4,530
Russian	2,700	8,600	4,640	2,130
Abater in % to Russian	81%	85%	63%	36%
Financing in % to Russian	160%	131%	139%	213%

Source: Consultant's estimate.

The environmental expenditure calculated according to the abater principle is lower than the expenditure calculated according to the Russian approach due to the following reasons:

- This enterprise pays substantial user fees for wastewater and solid waste disposal. Since the Russian methodology includes user fees for wastewater treatment, solid waste transportation and solid waste disposal, while the abater principle excludes this expenditure (because it is not the enterprise who is the abater), this is to be expected.

- In 1998, the enterprise reported current expenditure for air protection that was already reflected in form 18-KS as investments for conversion of power station to gas, leading to double counting. This could not be blamed on the Russian methodology, however. Rather, it is due to the lack of control of reported official data.

The environmental expenditure calculated according to the financing principle is higher than the expenditure calculated according to the Russian approach for the following reasons:

- The current expenditure for water supply is not reported in form 4-OS but is included in the questionnaire (as non-PAC);

- Fines, pollution charges and resource taxes are not included in current expenditure in form 4-OS but are included in the fees calculation in the case study;

Finally, user fee for solid waste transportation was paid by a barter scheme and not included in official reporting.

5 Conclusions

The purpose of this chapter is to put forward the conclusions to be drawn from the previous three chapters. It addresses the following four issues:

- Official Statistics. What are the findings with regard to the official statistics?
- Levels and Trends. What are the major findings with regard to environmental expenditure in the two regions?
- Environmental Financing Strategies. What are the implications of the findings for the environmental financing strategies in the two regions?
- Recommendations. Which changes are needed to improve environmental expenditure statistics?

5.1 Official statistics

Not full coverage of reporting organisations and enterprises

Not all enterprises that provide environmental services (especially in water supply, wastewater treatment, solid waste transportation and disposal) fill in official statistical formats. This under-coverage in official reporting systems results in underestimation of environmental expenditure in the regions.

The reasons that full coverage is not achieved are the following:

- solid waste transportation companies are not obliged to fill in form 4-OS as they have no environmental fixed assets and do not pay pollution charges, user fees or resource taxes;
- Enterprises with foreign property are not obliged to fill in form 18-KS;
- The public sector is not presented on the abater side neither for investment nor for current expenditure, the only exception being some occasional enterprises providing so-called municipal customer service, and their investment expenditure are not reported in official statistics. Bearing in mind the existence of several institutions on different levels involved in environmental protection, their administration and monitoring costs are not reflected. Furthermore, national parks and other protected areas do not report their environmental expenditure.

Not all environmental activities covered	Water supply is not considered an environmental protection activity and is not covered by form 18-KS or by form 4-OS. Furthermore, form 4-OS does not cover all environmental media. Noise preventive measures are not covered by Russian official statistics. These activities should be added in all environmental statistical formats.
Expenditure not reported	Many enterprises do have expenditure for environmental activities even though this expenditure is not reported in the official statistical forms. In Pskov, 16 enterprises out of the 33 enterprises in the survey had investment and/or current environmental expenditure but did not report this data in form 18-KS and/or form 4-OS. In Novgorod, 6 out of 20 had environmental expenditure but did not report this in the reporting forms 18-KS or 4-OS.
Difficult to get reliable information for previous years	The enterprises do not usually save the forms 18-KS and 4-OS from the previous years, i.e. when they filled in the new questionnaire they mainly based their answers on new calculations. The deviations between what was reported in previous years and what is reported in the questionnaire shows some uncertainty in the calculations made by the enterprises. Furthermore, it can be difficult for the enterprises and requires some effort for them to reconstruct data for previous years. For this reason official data reported for previous years is considered more reliable and to the extent officially reported data is available, this source should be used.
R&D expenditure very small	Only few enterprises reported R&D. The reason is the economic problems that most of the enterprises face, which means that they do not spend much money on research and development. The typical R&D expenditure consists of design of documents and preparation of so-called volumes of least admissible emissions and discharges for the enterprises.
Almost no noise abatement expenditure	Only one enterprise - the fertiliser plant "Akron" in Novgorod - reported current expenditure for noise preventive measures. This means that these figures are the only ones referring to noise abatement in both Novgorod and Pskov.
Only few receipts	Only one enterprise – also “Akron” – reported receipts. "Akron" is responsible for operating wastewater treatment for some parts of the population and industrial enterprises. Since wastewater treatment is not the main activity of the enterprise, the wastewater treatment fee revenues collected were regarded as receipts and were deducted from the expenditure.
Hidden investment expenditure at the vodokanals	Environmental investments at vodokanals constitute a special case. How the investment expenditure is reported depends on whether the funding is from local, regional or federal sources. Investments funded from local budgets are transferred directly to the vodokanals. This case is straightforward: the vodokanals are the abators and report the expenditure. However, often subsidies from regional and federal budget are transferred to municipal organisations that carry out the investments in question; that is, they are responsible for the investments until they are completed. In this case, the municipal organisations are the abaters. As the municipal organisations do not report their investment expenditure, this expenditure is hidden from the official environmental statistics.

Lack of budget information on subsidies

The data on budget subsidies for environmental protection is available only at local level. To have consistent figures at regional level, all local administrations should provide data in the same way. The split by sectors, industries and media requires the use of a specially developed database, but some local administrations are not computerised at all. As a result the regional information is very aggregated.

Lack of checking

The reporting of the statistical forms is not checked, which means that the data presented in them may deviate from investments reported to tax authorities and pollution charge exemptions provided by environmental funds. When the Annual State of the Environment report or environmental statistical yearbook is prepared the submitted data is used without thorough checking. This checking could be done in co-operation with the environmental committees. The data on paid pollution charges and provided exemptions reported by enterprises deviate from the environmental funds information (the figure reported by enterprises is higher, even though not all enterprises reported).

Investment subsidies are higher than reported investments

In Novgorod higher subsidies for environmental investments than the actual investment expenditure were reported. This could be due to:

- underestimation of actual investment expenditure, or
- enterprises' use of subsidies for non-environmental investments.

On the one hand, the enterprises might not be able to identify (or recall) all environmental expenditure. This could be the basis for a systematic tendency to underestimate when applying the abater principle based on questionnaires. On the other hand, the difference could also be due to enterprises receiving investment subsidies and using these funds for other purposes.

In the consultant's opinion the underestimate is due to a lack of comprehensiveness when filling in questionnaires. This would indicate an underestimate of reported investments. Therefore this difference was added to the enterprise expenditure.

The Russian approach mixes the abater and the financing principle

The case studies very distinctly demonstrate the difference between the two OECD principles and the Russian approach, especially for current environmental expenditure. In the Russian approach the abater and financing principles are mixed: user fees are included in current environmental expenditure on the abater side.

5.2 Levels and trends

This section provides an overview of the major findings from the survey in terms of figures. Four important conclusions are:

1 In the present survey investment expenditure was found to be significantly higher than official data

2 Current expenditure is much higher relative to investment expenditure

3 Wastewater constitutes the major share of PAC expenditure

4 Water supply (non-PAC) constitutes a significant share of current expenditure.

Survey expenditure is significantly higher than official data.

A conclusion from the survey is that the investment expenditure data revealed in the survey is significantly higher than the expenditure data reported in official statistics.

There are different reasons for this in the Novgorod and Pskov oblasts. In Pskov this is due to a broader definition of environmental expenditure in the survey relative to the official data collection. In Novgorod this is due to a drop-out in the official data collection.

Figure 5.1 shows official end survey investment expenditure in Novgorod and Pskov.

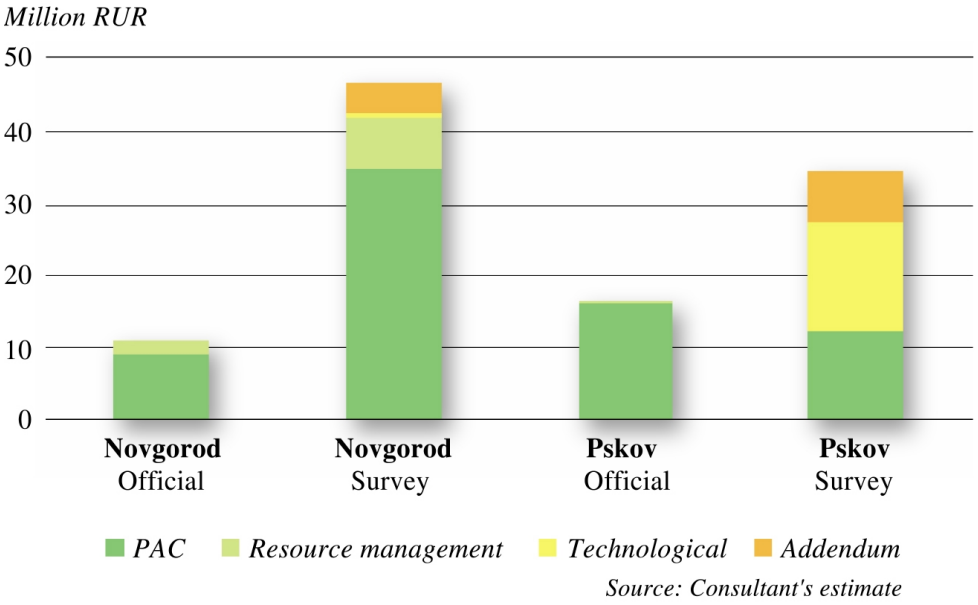


Figure 5.1 Investment expenditure, official and from survey, Novgorod and Pskov

Wastewater investment drop-out in Novgorod

In Novgorod, the survey revealed significant investments in wastewater not covered in the official statistics, as the expenditure made for (but not by) public utilities (Vodokanals) are inadequately covered. These investments are paid for by special "municipal customer services" and handed over to the vodokanals as fixed assets. These investments drop out of the official data collection system, because the "municipal customer service" enterprises do not report their investment expenditure.

Technological investments and nature protection in Pskov

In Pskov, the reason for the increase in environmental expenditure, due to the survey, is the inclusion of significant technological investment with environmental benefit and investments in nature protection not covered in the official statistics.

Current expenditure higher than investment expenditure

Another clear conclusion is that the current expenditure is much higher than the investment expenditure. This conclusion is the same for Novgorod and Pskov and holds true for both official statistics and survey data.

In Novgorod, the current expenditure amounts to 87% of the total environmental expenditure. In Pskov the investment share is a little higher and amounts to 83% of the total environmental expenditure.

Table 5.1 Current and investment expenditure, million Roubles/year

	Official		Survey	
	Novgorod oblast	Pskov oblast	Novgorod oblast	Pskov oblast
Investment	11	16	48	36
Current	145	66	321	180
Total	156	83	369	216
Investment %	7%	20%	13%	17%

Source: Consultant's estimate.

Wastewater constitutes the major share of PAC expenditure

For both Novgorod and Pskov, "water and soil" constitute the major share of PAC environmental expenditure. As wastewater is the major component in this category, wastewater is the major component in PAC expenditure.

Figure 5.2 shows the current expenditure in Pskov and Novgorod broken down by media. In Novgorod, 62% of current expenditure was allocated to the category "water and soil". In Pskov, 75% of total current expenditure was dedicated to wastewater treatment.

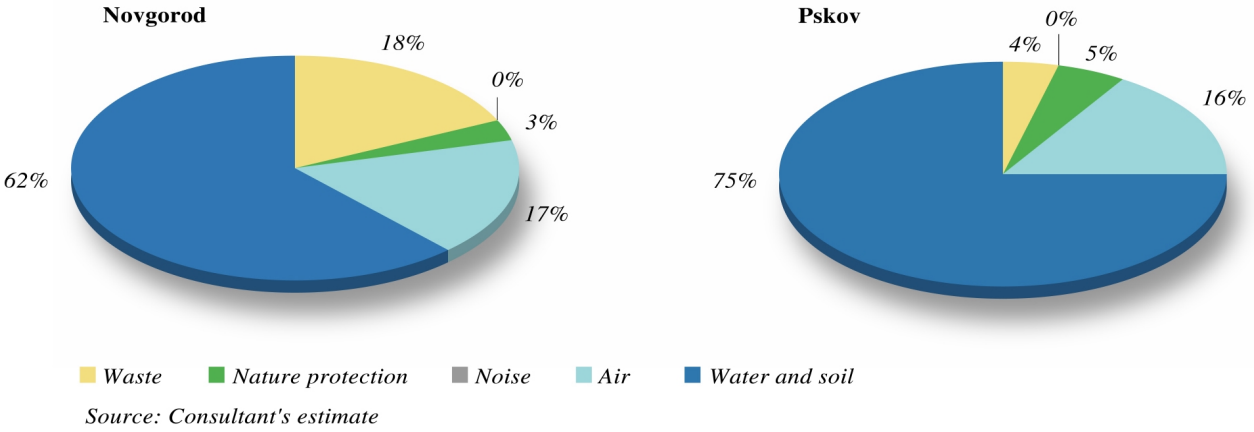


Figure 5.2 Current PAC expenditure by media

The same conclusion holds true for investment expenditure. In Novgorod 80% of PAC investment expenditure falls in the category "Water and soil". In Pskov the corresponding figure is 68%.

Water supply very significant in current expenditure

Finally, it is worth mentioning that the major supplement to the OECD PAC current expenditure component is resource mobilisation (water supply). The contribution to current expenditure from resource mobilisation is 41% in Novgorod and 51% in Pskov.

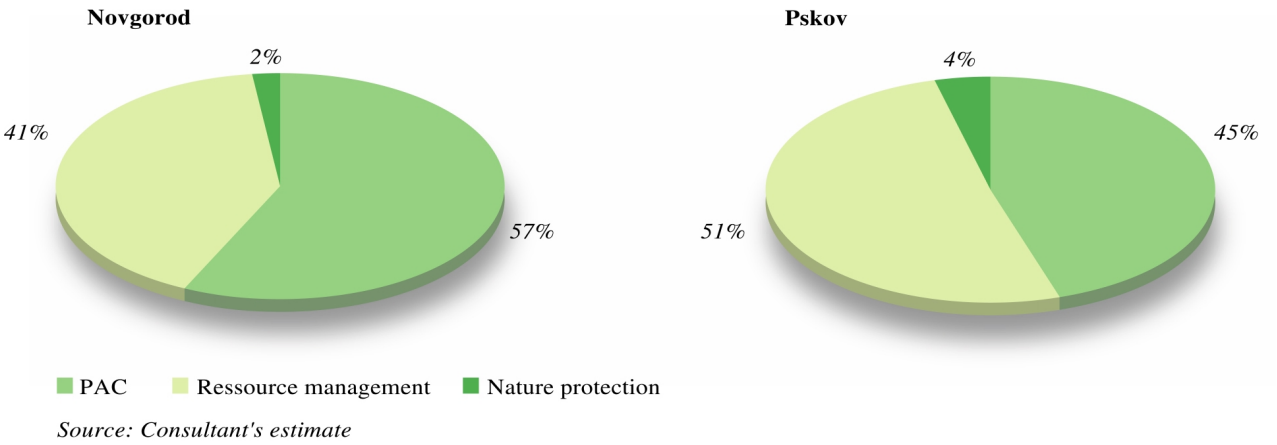


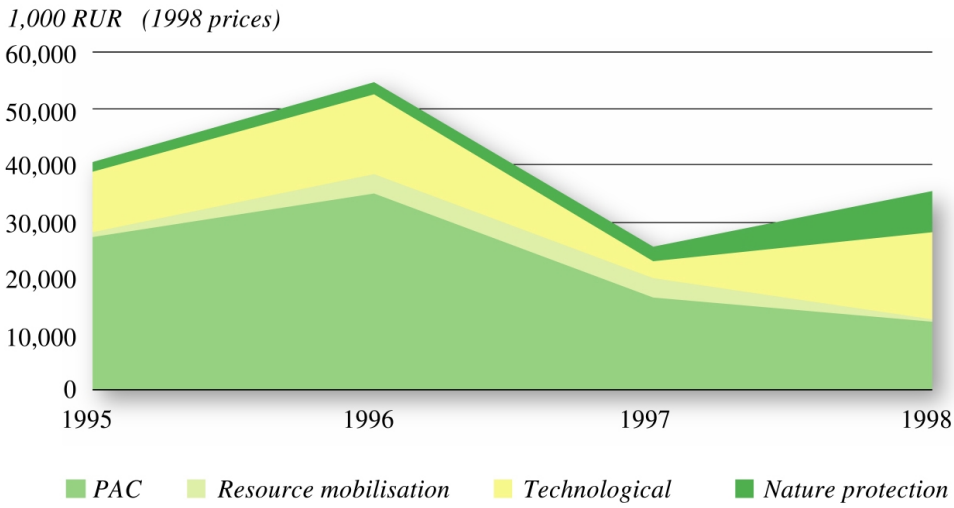
Figure 5.3 Current expenditure broken down by PAC/non-PAC

For investments, the resource mobilisation share of the total investment expenditure is 15% in Novgorod and close to zero in Pskov.

Decrease in environmental expenditure since 1996

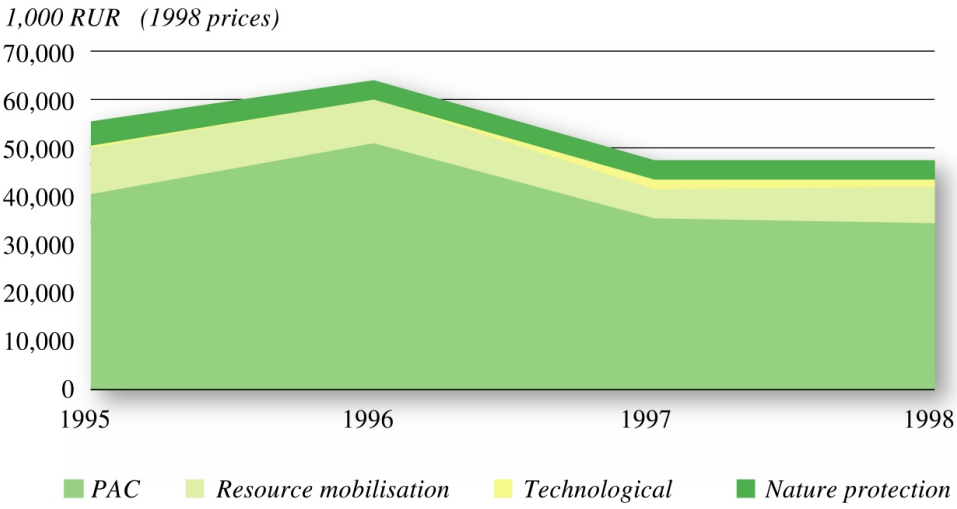
In both Novgorod and Pskov the investment expenditure increased from 1995 to 1996. Since 1996, the investment expenditure decreased. The reason for the decrease has been a significant decrease in the PAC investment expenditure, while the other components are stable or increasing.

Since 1996, the PAC investment expenditure in Pskov decreased, while investments in nature protection increased. The increase in nature protection investments was too small to compensate for the decrease in PAC investments. In Novgorod the trend is manly explained by PAC investments expenditure by one enterprise (Akron).



Price index: "Construction materials" taken from IMF country report (1999)
Source: Consultant's estimate

Figure 5.4 Trends in investment expenditure in Pskov, 1998 prices

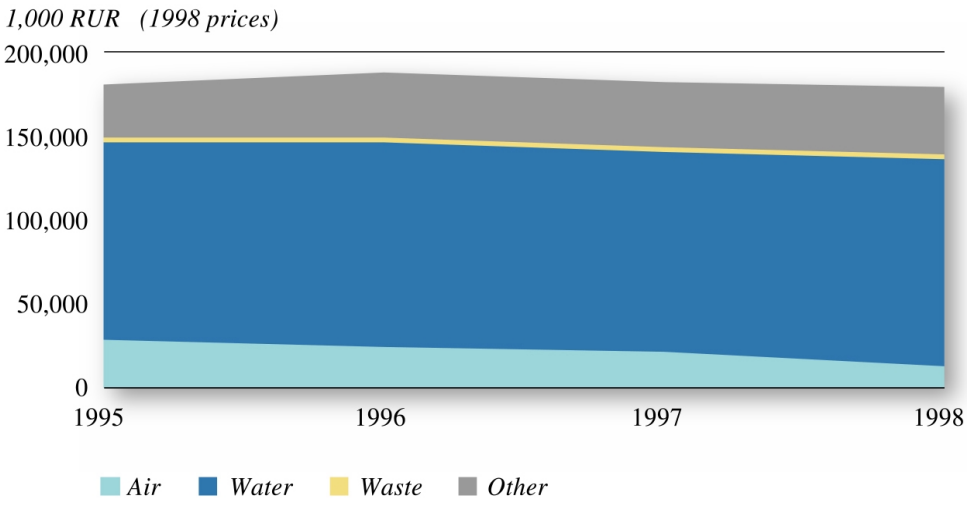


Price index: "Construction materials" taken from IMF country report (1999)
Source: Consultant's estimate

Figure 5.5 Trends in investment expenditure in Novgorod, 1998 prices

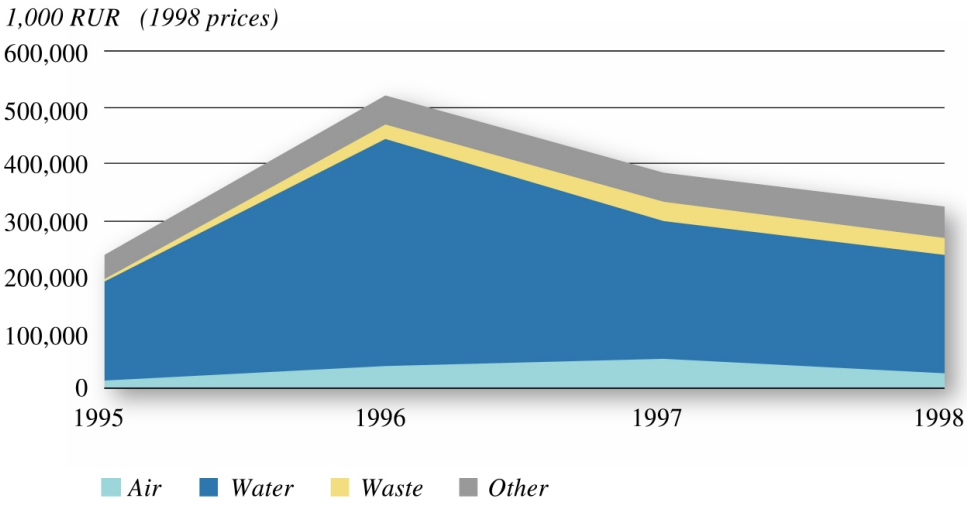
Current expenditure has been stable

There has not been a similar trend in the current expenditure. In Pskov, the current expenditure has been very stable. In Novgorod, there has been a significant increase in current expenditure, especially in wastewater expenditure from 1995 to 1996. However, since 1996 the level of current expenditure has decreased to a level close to the 1995 level.



Price index: "Construction materials" taken from IMF country report (1999)
Source: Consultant's estimate

Figure 5.6 Trends in current expenditure in Pskov, 1998 prices



Price index: "Construction materials" taken from IMF country report (1999)
Source: Consultant's estimate

Figure 5.7 Trends in current expenditure in Novgorod, 1998 prices

5.3 Environmental financing strategies

Three implications

There are three important implications of the abovementioned findings regarding the levels and trends in environmental expenditure in the two regions for the environmental financing strategies in these. These are the following:

- In so far as the water sector, comprising water supply and wastewater treatment, constitutes the major share of environmental expenditure the focus on the water sector in the environmental financing strategies seems adequate. The findings indicate that the environmental financing strategies for Novgorod and Pskov oblasts address the priority sector in these.

- Investment expenditure is very low, both in absolute terms and in relative terms. A particular striking feature is the low share of investment expenditure in total environmental expenditure. Taking into consideration the high share of water sector in investment expenditure and total environmental expenditure, this indicates that a serious dis-investment is happening at the vodokanals with the result that the age of the capital stock increases.

- The implications of the low level of investment expenditure per capita in comparison with selected OECD countries depend on the cause of this low level. In principle, there may be two causes: (i) low priority given to environmental expenditure within public and private sectors; and/or (ii) low income (or GDP) level. The share of investment expenditure in GDP (or GRP in the case of Novgorod and Pskov oblast's) for the two regions and selected OECD countries indicates that higher priority is given to environmental expenditure in Novgorod oblast than in Pskov oblast.

5.4 Recommendations

Improve coverage of reporting enterprises

The survey has demonstrated significant underreporting of environmental expenditure due to the present legal regulation on who is obliged to report. In order to improve the situation it is necessary to re-evaluate the principles about who should report environmental expenditure and to enforce the collection of data with the necessary means. The main point here is to make sure that all vodokanals, municipal customer service and enterprises with foreign ownership report environmental expenditure.

Information on budget environmental subsidies and environmental revenues for oblast and local budgets should be available at oblast level and published officially.

The lack of EFS subsidies and pollution charge exemptions information

1-EKOFOND does not require the split of information by environmental media, sector and industry. Therefore, it is not possible to meet OECD questionnaire requirements concerning official data. This calls for a reconsideration of the reporting form 1-EKOFOND.

More comprehensive coverage of financial transfers

Current expenditure presented in form 4-OS combines the abater and financing principles because they include user fees.

Reporting forms 18-KS and 4 –OS should cover the financing principle more comprehensively, namely:

- Form 18-KS should include funding sources broken down by sectors, industries and levels (federal, oblast and local levels separately) and for all environmental media. This funding should be reported not only by the implementing party but also by the funding organisation;

- Form 4-OS should also include user fees for water supply, taxes for other natural resources, compensations from budget for population tariffs for water supply, sewerage and solid waste. Pollution charges and resource taxes should be broken down not only by media but also by recipient level.

Broaden the definition of environmental expenditure

In order to capture all environmental expenditure, the definitions for reporting coverage should be broadened for both forms and cover all environmental activities, services and payments made by enterprises and organisations of all forms of property and by all sectors.

Annex I Sectors Classification

Ru	ISIC	Text
No		Industry name with ISIC code
1		Vodokanals
2		District heating + hot water supply
3		Municipal solid waste services
4		Other municipal services (gas, electricity)
		Total manufacturing (positions 5-14)
5	15	Food, beverages, tobacco
6	17	Textiles, leather
7	20	Wood, wood products
8	21	Pulp, paper, printing
9	24, 25	Chemicals, rubber, plastic
10	23	Refineries
11	26	Non-metallic mineral products
12	27	Basic metals
13	28-35	Metal products, machinery
14	36-37	Other
15	01-05	Agriculture, hunting, fishing, forestry
16	10-14	Mining, quarrying
17	45	Construction
18	60-64	Transport, storage and communication
19	50-52, 65-67, 90	Other services

DATASHEET

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Abstract:
The purpose of this report is to present data on environmental expenditure data for Russia. The major purpose for collecting environmental expenditure data is to assess the value of real resources (such as capital, labour, etc.) devoted to environmental protection activities. Environmental expenditure data:

- Provides valuable expenditure allocation information to decision-makers, both inside and outside the national government;
- Allows for cross-country comparisons, thereby making it possible to trace the impacts of the "Environment for Europe" process; and
- Provides a baseline for environmental financing strategies aimed at supporting the implementation of the National Environmental Action Plans.

Terms:
Russia; pollution abatement, pollution control; national environmental action plan (NEAP); environmental expenditure, environmental expenditure data

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