



Short Justification of the Novgorod Environmental Financing Strategy

Submitted to the Novgorod oblast administration



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OECD  OCDE

EAP Task Force

DEPA/DANCEE

Danish Environmental Protection Agency
Danish Cooperation for Environment in Eastern Europe

This report was prepared by COWI AS in association with COWIconsult International Ltd., Russian Federation.

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

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1 Introduction

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 to selected Ministries of Environment in the NIS.

These projects commenced in August 1999. The present document, "Novgorod: Short Justification of the Novgorod Environmental Financing Strategy" is one in a series of documents prepared by the project team.

COWI has been entrusted by DANCEE and the OECD EAP TF Secretariat to elaborate the regional **Environmental Financing Strategies (EFS)** for Novgorod and Pskov oblasts.

A short justification of the environmental financing strategy for the Novgorod oblast is presented in this paper. Following the methodology approved by the Clients, **the environmental financing strategy has been elaborated for a period of 20 years with focus on the environmental problems within the water supply and wastewater sector**, paying much less attention to municipal solid waste management and ambient air protection. Medium-term environmental targets, with the year 2010 as the final target, have been established.

It is anticipated that the strategy will provide a useful instrument in environmental policy development, as well as for planning public investments to maintain and develop the water supply and wastewater infrastructure in the Novgorod region. Adaptation of this strategy would allow the selection of projects and activities which are in compliance with environmental priorities, and with the ability to equalise the demand for financing with the available funding. This will allow an improvement in the quality of public capital expenditure budgets, development of regional environmental action plans, municipal infrastructure development, rehabilitation and modernization plans and, finally, the ability to attract more funds to the environmental sectors.

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2 Methodology

It was agreed that, for selected sectors, the regional EFS would establish specific realistic targets, which are in a compliance with the environmental priorities of the oblast, evaluate cost of the established targets achievement, assess social and economic affordability of the cost and recommend specific economic, social and environmental policies (or reduced targets), which would allow them to match the demand for financing with the funds available.

COWI experts have proposed, and applied, the following EFS methodology, which was approved by the Clients (OECD EAP TF Secretariat and DANCEE):

Survey of the existing situation in the selected sectors.

For the selected sectors, the following issues were inter alia examined: service coverage of population; volume and quality of products/services provided; status of the fixed assets, environmental performance indicators and main environmental problems; historical data on the recurrent and capital expenditures financed from all sources, etc.

Development of the costing model (the Decision Support Tool)

COWI experts have developed a computer model which estimates the recurrent expenditures needed for sustainable maintenance of existing infrastructure, as well as for the capital investments needed to achieve specific environmental targets. It is anticipated that the model will be used as a support tool in decision-making.

Input data for the costing model includes inter alia numerous indicators, characterising the technical status of existing infrastructure and O&M, demand for the products/services provided by the selected sectors (historical data and the forecast), structure of the production costs, etc.

Cost functions were elaborated using the regression analysis methods applied to historical data on the cost of achieving specific environmental targets in specific urban areas. The targets include: construction of water-supply and sewerage systems and waste water treatment facilities with specific installed capacity, construction and operation of a municipal solid waste landfill with specific installed (installation?) capacity, etc. Although the empirical cost functions were elaborated on the basis of the data received from different (various)

countries, and the functions give estimates in average west-european prices, a method of the cost functions adjustment applying price correction factors was developed, which allows one to obtain reliable estimates for any country.

Formulation of environmental targets and targets costing

As a result of an intensive dialogue between COWI experts, Novgorod oblast Administration and other oblast stakeholders, specific, measurable, agreed, realistic and time-bound (SMART) environmental targets for the selected sectors have been formulated.

The costing model was then used to estimate, firstly, the demand for recurrent expenditure financing needed to provide sustainable maintenance of the existing infrastructure (the so-called «baseline scenario»), and secondly, the capital investments needed to achieve the established environmental targets.

Assessment and forecast of available environmental funding

Based on a historical data analysis, a forecast for some variables/indicators is made, which inter alia includes:

main macro-economic indicators; population, living standard, households revenues and structure of the households expenditure; the oblast consolidated public revenue and expenditure budgets; demand for goods and services produced by the selected sectors; financing of the sectors, etc. Based on this data, a forecast of available environmental recurrent and capital expenditure financing is made.

Financing gaps assessment. Identification and analysis of options for closing the gap(s)

By comparing the demand for recurrent and capital expenditure financing with the funds available from all sources, two gaps are estimated. Firstly, the O&M financing gap which should be closed to achieve sustainable maintenance of existing infrastructure. Secondly, the capital investments financing gap, which should be closed to achieve the established environmental targets.

To assess whether or not the targets are affordable, i.e. for the population in the region and for the regional economy, the recurrent expenditure and capital cost affordability is assessed under the assumption that the share of expenditure on municipal economy and municipal utilities in the consolidated public budget and in the households expenditure budget cannot exceed a certain maximum affordable level.

Economic, financial, social and environmental policy options, which could close/reduce the financing gap(s), are identified and analysed, and different policy scenarios are proposed. Firstly, the gaps could be closed to increase funding, including finding funds from the user charges/tariffs. This would require a change in tariffs and tariff policy.

Secondly, there are also options to reduce the gap by reducing recurrent expenditure by improving efficiency, and/or reducing the demand for capital investments by sacrificing/reducing environmental targets. The last option becomes necessary if the cost of achieving the environmental targets turns out to be socially or economically unacceptable and/or if the identified options are not sufficient to close the financing gaps. Scenarios which include a combination of several options (raising funds and, simultaneously, sacrificing/reducing the targets) are also identified and analysed in the report.

Finally, the most realistic scenarios for achieving the strategic targets are designed.

3 Progress in the strategy development for Novgorod oblast

The environmental financing strategy has been developed in close co-operation with the authorities, committees and departments of the Novgorod Oblast Administration, SCEPNO, «Novzhilcommunservice» and other stakeholders. The Advisory Committee was established to coordinate the project implementation in the region. Following the approved EFS methodology, the status of the oblast economy and public finance was examined, as well as the status and performance of municipal water supply and sewerage and municipal solid waste sectors. The necessary input data was collected, and the environmental targets of the regional EFS were formulated and approved by the Advisory Committee. Simultaneously, the costing model was elaborated.

On the basis of collected input data, COWI experts estimated the cost of achieving the targets and assessed the financing gaps. To close the gaps, different economic, financial, social and environmental policy options and scenarios were identified and analysed. The main results of the work done are presented in this paper.

4 Economic and financial status of the Novgorod oblast – indicators used for macroeconomic forecast

4.1 Background of the regional economy

The Novgorod Oblast's real **gross regional product (GRP)** increased by 2.5% during the period 1994-1998 (while real GDP in Russia declined by 11% during that period), and further increased in 1999. The average per capita GRP in the region amounted to USD 1,250 in 1998, which was 30% lower than the average for Russia.

The Oblast's economy and the public budget are rather sensitive to the economic performance of a few major industrial enterprises, such as "Akron" in the chemical industry, "Borovichi Fireproof Materials" in ferrous metallurgy, and some major enterprises in the food processing and wood processing industries. In 1999, industrial enterprises received 74% of their sales revenues in cash.

Compared to other regions of Russia, foreign direct investments (FDI) in the Novgorod region are relatively high and close to the level experienced in the Baltic States. (60-100 \$ per capita per year).

4.2 Population and households revenues and expenditure

By the beginning of 1999, the total population in the region amounted to 734,000 inhabitants, but has declined in recent years. No major changes in the total population are expected in the medium term. 71% of the population lives in urban areas. Four cities account for 45% of the total population. The population of the city of Novgorod-the-Great amounts to more than 230,000.

The labour force amounts to about 50% of the total population. The unemployment rate (calculated according to the ILO methodology) is reported to reach 15%. Real salaries have increased by 10% since 1995. Average nominal wage/salary amounted to RUR 1308 in 1999, while the official minimum living standard was RUR 896. It is estimated that 25% of the population live below the minimum living standard. Still, on average, the income distribution is more equal in the region than in Russia. Non-wage income (social transfers, earnings

from households' own farms, interests on bank deposits) constitutes more than 50% of total household income in the region.

Household expenditure on municipal services constitutes on average about 6% of disposable income. Water and wastewater user charges account for 0.4%, while solid waste charges accounts for 0.1% of the household average disposable income.

4.3 Novgorod Oblast Consolidated Public Budget (CPB)

In 1999, the Novgorod oblast consolidated public revenue budget amounted to RUR 1,780 million, corresponding to 11% of the GRP, compared to 14% in 1997 before the 1998 crisis. Transfers from the federal public budget amounted to RUR 357.6 million in 1999.

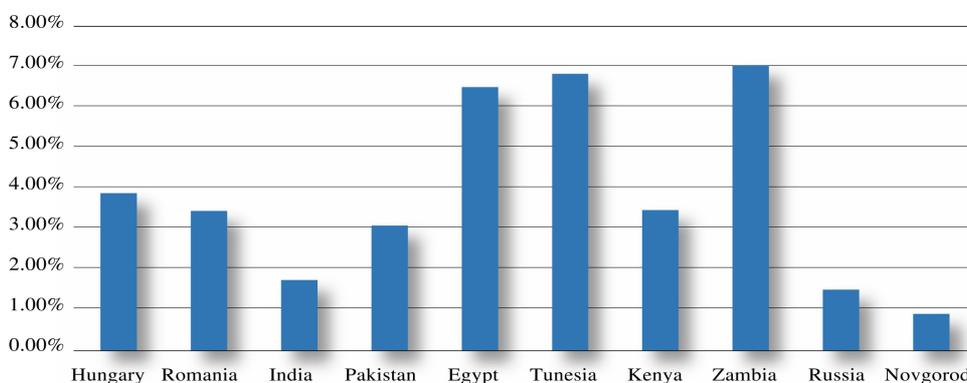
In 1999, the main sources of (revenue to) the public budget own revenue? were as follows: profit tax (27% of total own revenues), personal income tax (19% of total own revenues) and various turnover and sales taxes accounting for 23% of own revenues in 1999. Natural resource taxes accounted for only 3% of own revenues in 1999 down from more than 6% in 1997.

Recurrent expenditure accounted for 95% of the consolidated public expenditure budget, while the remaining 5%, corresponding to 0.6% of GRP, refers to capital expenditure. This share is significantly lower than the level experienced in other middle-income countries (with a slightly higher or lower income than in Russia) as indicated in **Error! Reference source not found.** below¹. **Public environmental investments account for less than 20% of total public capital expenditure, corresponding to only 0.1% of the GDP** (this includes water supply, wastewater treatment and solid municipal waste).

According to the Russian Ministry of Finance's methodology, the Novgorod Oblast creditworthiness rank is considered as "medium". It is expected that the creditworthiness rating of the Oblast will increase in the year 2000.

¹ Source: A. Markandya & P. Francis (1999); Promoting Private Sector Participation in the financing of sustainable development for non-Russian figures.

Figure 4.1 Public Capital Expenditure as % of the GDP (GRP)



4.4 Financial markets

The local financial markets are not sufficiently developed. By the end of 1999, the total booked loans, provided by regional banks, amounted to 136 million RUR, which corresponds to less than 2% of the GRP. Interest rates, as well as interest spreads, are high.

4.5 Macroeconomic forecast

The supply of environmental finance as well as the demand for environmental expenditure depends inter alia on the development in a number of key macroeconomic indicators such as real GDP, population etc.

Real indicators	presents the projected developments in the main real variables i.e. real GRP growth, population growth and the unemployment rate. 1999 is the base year in the real indicators projection. In addition, nominal GRP per capita is presented together with the share of salaries in the gross regional product.
Projection period	Macroeconomic indicators for the projection period, which covers the period 2000-2020 are depicted in the table.
Stable growth	The macroeconomic forecast assumes that the Russian economy enters into a stable growth (enters a stable growth period) scenario in which inflation and exchange rates are stabilized and the economy is not affected by major external shocks or enters into vicious cycles (or by the inability to change bad/detrimental practices).

4.5.1 Key assumptions

The following main assumptions have been applied in the forecast:

Real GDP (GRP): It has been assumed that growth rates will converge and approach the level of 3% per year from the year 2000 and onwards.²

Public own revenues: It has been assumed that the ratio "Public own revenues/GRP" recovers gradually to 13% in 2001 and stabilises at 14% in 2002, which equals the level experienced in 1997.

Population: The population is expected to decline by a modest 0.2% over the next five years before stabilising in the year 2005.

Unemployment: Unemployment is assumed to remain at the present level of 15% throughout the projection period.

Salary share of GDP: The salaries&wages' share of GRP is expected to increase from its present low level of 40% until stabilizing at 48% in 2007³.

Salaries: Real salaries (wages) are assumed to follow the development in real gross regional product adjusted for salaries' increasing share of GRP. Nominal wages are assumed to follow domestic average annual inflation and the real wage.

Household incomes: In the development in household incomes is depicted. As indicated, it is assumed that on average each household consists of 2.8 persons with 1.4 wage earners per household. In 1999, about 50% of household incomes consisted of non-wage related incomes. This has been maintained in the projections though with a minor decrease of 3-4% over the projection period.

Inflation: Domestic inflation is expected to drop from the very high levels in 1998 and 1999, gradually achieving a long-term level of 8%. Foreign inflation is assumed to remain constant at 2.5% throughout the projection period.

Exchange rate: A further depreciation in RUR is assumed. The exchange rate is assumed to follow the difference between domestic and foreign inflation rates.⁴

The presented macroeconomic forecast is used in policy scenarios presented in the subsequent sections.

² Note that IMF (1999) projects 4.6% average real GDP growth per year in transition economies over the period 2001-2004.

³ The assumption about the increasing share of salaries in GRP is relevant for assessing the development in future household incomes and affordability.

⁴ Which is equivalent to assuming an unchanged real exchange rate.

Table 4.3 Development in population, nominal salary and average household income

Indicator/year	1999 (estimate)	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Population	734,000	732,532	731,067	729,605	728,146	728,146	728,146	728,146	728,146	728,146	728,146	728,146	728,146	728,146
Average annual salary (RUR)	17,208	22,240	26,951	31,820	36,909	42,427	48,551	55,558	63,287	70,726	78,675	87,518	97,356	108,298
Average household income (RUR)	47,578	61,184	73,777	86,674	100,041	114,437	130,317	148,403	168,235	188,009	209,141	232,648	258,798	287,887

Source: Consultant's calculations based on the presented above assumptions.

5 Environmental priorities, problems and targets

The key environmental priorities in the Novgorod region are as follows:

- Drinking water supply;
- Wastewater treatment;
- Solid municipal waste collection and disposal; and
- Reduction of emissions of dust and particulate matters, as well as air pollution from cars.

5.1 Environmental policy context

The Oblast administration provides the overall co-ordination of environmental policy preparation and implementation. The main environmental programmes in the Novgorod oblast are:

- Regional Environmental Action Plan (REAP) is being prepared;
- "Provision of Drinking Water to the Population of the Novgorod oblast 1999-2010";
- The federal Programme "Restoration of the Volga River";
- The regional programme "Anti-chlorine"
- The regional programme "Fish"

Programme implementation is delayed due to lack of funds.

5.2 Environmental problems and objectives

Water-supply

The number of tests carried out that are not in compliance with drinking water quality standards indicates that tap water quality is a significant problem. The average share of tests in compliance with chemical standards is 77% and for

biological standards the share is 88%. However, in smaller cities the incidence of failed tests is as high as 50-60%.

The main reasons for the poor water quality is the use of surface water with a heavy load of organic matters and secondary pollution in the deteriorated water distribution network.

Wastewater Though all wastewater treatment facilities were constructed and commissioned as mechanical-biological facilities, a substantial number of the facilities are worn out and do not provide efficient treatment. Sewerage connections vary between 50-90% in cities with more than 1,500 inhabitants. A major share of wastewater is discharged without proper treatment, if any.

The water sector suffers from years of under-investment and a lack of systematic maintenance over last 8-10 years, while the facilities, especially networks, are extremely deteriorated.

Solid Waste With respect to solid municipal waste management and disposal, only one of the 38 landfills in the Oblast (almost) fulfils EU standards. The poor state of landfills is one of the main causes of soil and underground water pollution. The collection system is insufficiently developed. The same is the case with respect to the institutional and regulatory set-up.

Air Trans-boundary air pollution is the main source of SO₂ and NO_x emissions. Still, in certain areas, problems, with respect to dust and particulate matters emitted by municipal boilers, and emissions from mobile sources, are experienced.

Environmental objectives The main environmental objectives of the strategy are:

- Provision of standard quality drinking water through rehabilitation, protection, prudent use, and prevention of pollution of water sources;
- In solid municipal waste management, the key objectives are to develop the regulatory framework, improve the operational and technical capacity of landfills and extend coverage;

No long-term objectives have been formulated with respect to air pollution.

5.3 Environmental targets

Specific, measurable, accepted, realistic and time-bound (SMART) environmental targets have been formulated and developed for urban areas in Novgorod with more than 1,500 inhabitants with a view to achieving the above long-term objectives with the target year 2010.

Within water supply, targets have been formulated in terms of tap water quality, regularity and coverage. The main priority of the Novgorod oblast is to improve tap water quality. A reduction in the number of failed tests to levels of

5-10% for bacterial tests and 10-30% for other tests is targeted for 2010. In addition, the Oblast aims at improving service coverage by 3-6 percentage points.

The Oblast aims at achieving sufficient, and efficient, municipal **wastewater** treatment in 2010 by applying mechanical-biological treatment. In addition, service coverage should expand by 2-3% over the period 2000-2010.

For solid municipal waste, the Oblast aims at closing landfills that have high capacity utilization or that heavily pollute ground water sources (Borovichi) and constructing new landfills in compliance with EU standards. It is considered realistic to construct four new landfills by the year 2011. Institutional strengthening and development are also key priorities.

As a main target towards air protection, the Oblast intends to reduce emissions of dust and particulate matters from municipal boilers.

5.4 Actions to achieve the environmental targets

It is anticipated that implementation of the following measures will allow the achievement of the strategy targets:

Water supply – rehabilitation of water intakes and wells, water treatment facilities; installation of more energy efficient pumps; proper maintenance and expansion of water supply network; the conversion from surface water sources to ground water sources.

Wastewater – rehabilitation and construction of mechanical-biological wastewater treatment facilities and pumping stations; rehabilitation of deteriorated networks.

Solid waste – investigation of hydro-geological conditions on existing dumps and landfills; closing down of four existing and constructing (instead of the closed) of four new landfills in compliance with standards.

Air protection – equipping municipal boilers, which are responsible for high concentrations of dust and particulate matters, with filters and scrubbers.

6 Baseline service level costing. Operations and maintenance financing gap

Before aiming at higher service levels and improved environmental performance, the existing water, wastewater and solid waste infrastructure should be properly maintained (see Figure 6.1).

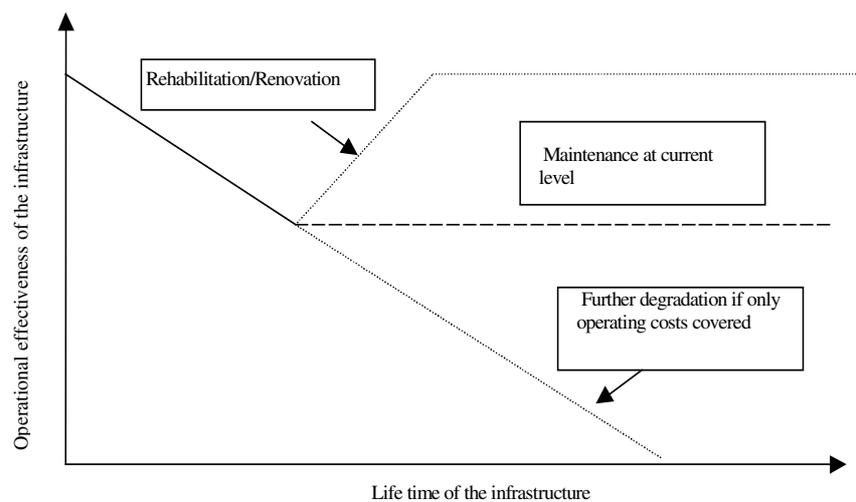


Figure 6.1. Maintenance, rehabilitation and degradation of the infrastructure.

Experience from many countries demonstrates that sustainable maintenance and preservation of the present infrastructure, and service levels, requires that annual maintenance expenditure, on average, amounts to 2.5-3% of the assets replacement cost.

In the baseline, sustainable operations and maintenance expenditure (O&M) would be 110% higher than the present O&M. The additional cost of about RUR 380 million a year, i.e. operations and maintenance gap, is mainly related to the water and wastewater sectors.

7 The environmental targets costing

To reach the established targets over the period 2000-2010, in addition to the annual asset renewal of 2.5-3%, additional renewal/rehabilitation of at least 18% of the water distribution networks and 14-15% of other fixed assets in water supply, and at least 10% of wastewater treatment facilities and 5% of sewerage networks is required.

The estimated investment cost to achieve the environmental targets is RUR 1,964 million (USD 70 million) in 1999 prices or on average RUR 180 million per year over the period 2000-2010, 90% of which is directed at water and wastewater systems development and rehabilitation. About RUR 300 million of the total investment cost concerns extension of service coverage.

It is estimated that the average annual investment cost in order to reach the environmental targets amounts to only about 50% of the annual maintenance and asset renewal cost in the baseline, i.e. the annual expenditure required just to maintain the present service level.

8 Supply of finance

8.1 Main sources of financing

The realistic sources of financing for the environmental investments are the Oblast Consolidated Public Budget, the regional environmental funds system, bilateral donors and self-financing of investment costs through user charges. The Russian banking system and loan financing agencies are not considered realistic financing sources in the short term, while they could be realistic sources in the long term.

Public budget	<p>The public budget own revenues, as a percentage of GR, reached a low of 11% in 1998, but are expected to recover and reach 14% in 2002, corresponding to RUR 2,270 million in 1999 prices. The total public capital expenditure budget amounts to about 5% of total public budget expenditures or 0.6% of GRP.</p> <p>Less than 20%, or RUR 18 million, of the public capital expenditure budget, corresponding to 0.1% of GRP, was destined for environmental investments in 1999.</p>
Environmental Funds	<p>The total revenues of the environmental funds system in Novgorod Oblast amounted to RUR 8 million in 1999, of which 25% was allocated to environmental investments.</p>
Total local resources	<p>Hence, in 1999 total Oblast public budget resources for environmental investments amounted to about RUR 20 million.</p>
Donors	<p>Bilateral donors, primarily from the Nordic countries, have provided grants and investments for environmental projects in the Novgorod region in the past. These are also the most likely sources of co-financing in the near future (2000-2004). In the medium and longer term debt financing, attracting soft Ifs loans will be an option. How much co-financing the Oblast might attract depends inter alia on the ability to identify, prepare and market environmental project opportunities.</p>

8.2 Available financing (Baseline scenario)

Baseline scenario	<p>The so-called Baseline scenario is a starting point for the forecast of environmental expenditure financing. The following key assumptions have been</p>
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applied when estimating the baseline supply of finance for urban water and municipal solid waste sectors:

- Real GRP, public budget revenues, population and population incomes follow the proposed macroeconomic forecast;
- Public expenditure and capital investment priorities remain unchanged;
- “Cash value” of the user charges collected remains at present (1999) level;
- Financing from other local sources (ecofunds, etc.) remains at present level in real terms;

Public own revenues/
GRP

- Only disbursed foreign and domestic loans and grants (if any) are taken into account.

It has been assumed that the ratio "Public own revenues/GRP" recovers gradually to 13% in 2001, stabilising at 14% in 2002.

Share of environmental expenditure in the consolidated public budget

In 1999, public recurrent and capital expenditure in urban water and municipal solid waste sectors amounted to 10% of the public own revenues in Novgorod region. In the baseline scenario it has been assumed that the share of the public environmental expenditure in the sectors in question will remain the same during the projection period.

The capital investments amounted to 5% of the public sector's own revenues in 1999. In real terms, the financing available for investments from the public budget amounts to approximately RUR 90 million in 2000.

Share of environmental expenditure in total public capital expenditure

Less than 20% of the public capital expenditure in 1999, corresponding to 1% of the public sector's own revenues, was destined for capital investments in the waste and wastewater sector or the solid waste business. The Oblast administration expects that this share will remain unchanged in the medium term. The Advisory Committee indicated that a realistic level of financing from the public budget for environmental investments in the water, wastewater and waste sectors corresponds to about 20% of the annual public capital expenditure, i.e. about RUR 20-30 million in real terms annually. This amount of funding would be available to co-finance investment projects.

Ecofunds

In the projection it has been assumed that the pollution charges are adjusted in line with annual average inflation with a one-year lag, collection efficiency and the total emissions remain constant. RUR 8-13 million of the ecofunds money will be available for environmental investments in the long term (year 2005-2010). However, as a result of present spending priorities and the pollution charges exemption scheme, only RUR 3 million in real terms will be available annually from the EF system for co-financing investment projects.

External finance

In the baseline it has been assumed that no foreign grants and loans are available.

User charges	It is assumed that the cash value of the collected user charges will remain at the present (1999) level of about RUR 183 million during the projection period.
Aggregated supply	In real terms the aggregated supply of environmental finance over the period 2000-2010 in the baseline is estimated at about RUR 9.1 billion or RUR 433 million per year.

9 Financing gap

Total available funding should be compared to the environmental expenditure requirements of RUR 15,198 million. The gap amounts to about RUR 6,070 million. This figure includes insufficient financing of the operational cost and the maintenance backlog of RUR 3,873 million.

Conclusion

So, in the baseline scenario, environmental targets which require infrastructure development and/or extension are not affordable as a significant increase in the supply of finance is urgently needed just to provide sustainable maintenance of the present infrastructure.

10 Closing the financing gap

There are several options which would close the gap. Firstly, on the supply side, to increase the available finance. Secondly, on the demand side, to reduce targets and, finally, to consider combinations of reduced targets and increased finances.

10.1 Closing the operations and maintenance gap

In order to reach financial sustainability, municipal utilities need to cover recurrent costs from their sales revenues. For this both tariffs and tariff collection rates need to be increased to the full cost recovery level.

This policy is being implemented in the Russian Federation with the aim of achieving full O&M cost recovery tariffs by the year 2005. The analysis above stresses the urgency of the policy and the need to accelerate its implementation. Otherwise, the maintenance backlog will grow creating a further deterioration of the present infrastructure.

Water sector

For water and wastewater, the present tariff levels are 1-1.5 RUR/m³ for households and 3-6 times higher for industry and budget organisations indicating (very often) substantial cross-subsidisation.

Achieving sustainable operations by increasing maintenance towards to the required level results in substantially higher operations and maintenance costs than present O&M.

The most realistic approach to generate additional financial resources needed to cover the operations and maintenance cost, and thus ensuring financial viability of the municipal water utilities, is to introduce economic pricing principles in the water sector for all customers. Maintaining the present tariff structure, while pushing tariff levels upwards, is not likely to generate the required additional financial resources given the past experience with low tariff collection from industry.

Hence, reviewing existing tariff policies is proposed with a view to increasing tariffs gradually over the period 2000-2005 to achieve full cost recovery in 2005. Over the same period cross-subsidisation should be gradually phased out. Closing the operations and maintenance gap by increasing the tariffs in the medium term is considered realistic and affordable for the Novgorod oblast econ-

omy and population, as on average households expenditure on water, waste water and solid waste services presently amount to less than 1% of households' disposable income.

If this policy is adopted, the water and wastewater tariff for households is projected to increase from its present level of 1-1.5 RUR/m³ to 10 RUR/m³ (in 1999 prices, i.e. 6-10 times) by 2005, while real tariffs for all other customer groups will increase by 30-50%.

The important element of such tariff policy is targeted transfers from the public budget to the households with income below the official minimum living standard.

The water and wastewater tariff will reach its peak level in 2005, when household expenditure on these services will on average amount to 4.4% of disposable income (i.e. very close to the level of 4% which is considered acceptable). After 2005 peak level user charges will decrease and by 2020 will be about 2.7% of households disposable income.

Solid Waste

Industry is presently covering the main part of O&M costs related to solid municipal waste. Household expenditure on solid municipal waste amounts to 0.1% of disposable income, which is lower than in other middle-income countries.

In order to cover the operations and maintenance gap in the solid municipal waste business, the following is recommended by the Consultant:

- *To review existing tariff policies and the institutional and regulatory set-up in the municipal solid waste sector ensuring that all connected households pay the full cost of the service.*

It is projected that household tariffs should be at least doubled in real terms in order to ensure prudent operations and maintenance of landfills. Hence, household expenditure on municipal waste collection and disposal would amount to at least 0.2% of disposable income (the level below 1% of household disposable income is considered affordable).

10.2 Closing the environmental investment gap

Supply side measures

Year 2006 is assumed to be start-up year for implementation of a new capital investment programme in water sector, while an investment programme in the waste sector will start in 2000. This reflects the profile of the recurrent expenditure financing gap, which falls to zero in the year 2005, and from year 2006 and onward there is surplus which allows implementation of a new capital investment programme.

The investment financing gap in 2000-2010 is huge, but from 2011 revenues exceed recurrent expenditure and there is a significant surplus of RUR 150 million per annum and more. There are two options: either to postpone the targets achievement or to take loans in the period of 2006-2010 and pay the loans back using the surplus in 2011-2020.

Preliminary recommendations

If the region considers achieving the targets over the ten-year period 2000-2010, then implementation of the following policies is considered to be the main policy measure in order to increase the supply of finance for environmental investments to address accumulated maintenance backlog and close the environmental investment gap:

- Increase tariffs to the full cost recovery level by 2005. The tariff collection rate also needs to be increased, while the share of non-monetary revenues in water utilities revenues needs to be drastically reduced to increase the «cash value» of the collected user charges;
- Keep the (real) tariffs at the peak level of 2005 for an extended period and allow Vodokanals to eventually self-finance capital development;
- Apply a strict policy on connection fees to finance extensions of the networks;
- Generate much higher public own revenues and/or commit a much higher share of the public expenditure for the purposes of financing the environmental investments;
- Attract more donors' and IFIs' attention.

Option 4 implies that public spending policies and priorities will have to be revised with more emphasis on capital expenditure and/or environmental investment. The analysis shows that it will not be sufficient to rely entirely on increasing the public own revenues/GRP ratio to close the gap.

Demand side measures

The following interventions would reduce the investment financing gap:

1. Energy savings, reducing water demand as well as water losses in the water distribution networks; conversion of water supply from surface to groundwater sources, located near urban areas (especially in the areas, where surface water intakes are now located many kilometers from the customers) – all these measures would reduce recurrent cost and reallocate savings for capital investments.
2. The financing gap might also be closed if some of the established targets are sacrificed, while the supply of finance remains at the baseline level. Such a scenario requires that most water and wastewater renovation programmes are canceled. Only limited investments in new facilities might be financed to the extent that newly connected customers are willing to pay connection fees.

10.3 Priority Investments

COWI and local experts participating in elaborating the EFS for Novgorod oblast, consider as the most prior projects and activities aimed at:

- water and energy saving, which includes replacement of worn out pipes and highly energy consuming pumps;
- conversion from surface water supply to ground water supply sources; and
- efficient mechanical-biological wastewater treatment (rehabilitation and/or construction of mechanical-biological wastewater treatment facilities).

When changing the EFS targets and, hence, reducing the capital investment programme, investment projects of the above types should be kept in the programme and implemented to the extend possible.

11 Realistic policy scenario

The following policy measures are considered realistic and being applied in combination would close the financing gaps and allow the achievement of established environmental targets:

Increase the Public Own Revenues/GRP ratio to 15% by 2003

The direct effect on the financing gap is limited. The indirect effect through fiscal stabilization may however allow the public budget priorities to be adjusted with more emphasis on capital expenditures in general and environmental investments in particular.

Increase the share of environmental investments

Even if the share of environmental expenditure in public budget is reduced from present 10% to 5% in 2005, so that environmental capital expenditure comprises 5% of public own revenues but the operational subsidies are completely phased out, in combination with other proposed measures that would be sufficient to close the gap. Still, public environmental investments would amount to less than 1% of GRP.

Maintain tariffs at 2005 peak levels

Instead of letting the average tariff follow the operations and maintenance costs downwards, tariffs could be maintained at their peak levels in 2005 for an extended period and the "surplus" be reserved for self-financed capital development by the water and wastewater utilities.

Increase "cash value" of the user charges collected

It is considered realistic to increase the collection rate of non-household tariffs from present 70% to 80% and reduce share of non-monetary revenues of water utilities from the present 50% to 25% in the period of 2000-2005.

Apply a strict policy on connection fees

The full capital investment cost of connection should be covered by the newly connected users reflecting the higher service level and asset values (in case of private property).

Attracting more grants and loans

It is assumed that foreign donors will continue providing financial support to the region in 2000-2005, amounting to about USD 1 million in 2000-2001 and gradually going down to zero in 2006.

It is also assumed that afterward, in 2005-2010, Novgorod Oblast will have access to soft loans at a real interest rate of 5% p.a. with a 15-year payback and 3-year grace period. To bridge the gap and implement the capital investment programme needed to reach the targets it is sufficient each year to attract a loan of USD 10-11 million over the period 2006-2010. The debt service will cost less than RUR 200 million at peak, which is less than 1% of GRP or 6.5% of public own revenues, which is considered affordable. The loans could be guaranteed by the public budget and repaid using free cash, which can be raised to keep the increased user charges at peak of households affordability over the period of loans repayment.

Combining the measures

No one measure alone but only a combination of all the above measures is sufficient to close the financing gap. The most potent policy measure are the investment priorities of the consolidated public budget followed by overall expenditure priorities of the public budget i.e. capital vs. current expenditure.

12 Conclusions and recommendations

The key elements for a strategy to improve the environmental performance and to achieve the environmental targets established by Novgorod Oblast are:

- *Review existing water and wastewater tariff policies with a view to increase tariffs gradually over the period 2000-2005 to achieve full cost recovery in 2005. Over the same period, the tariff structure should be re-balanced gradually in order to phase out cross-subsidisation.*
- *Review existing tariff policies and the institutional and regulatory set-up in the waste sector with a view to ensure that all connected households pay the full cost of the service.*
- *Review the present expenditure priorities of the Public Budget in order to increase environmental investments.*

The main conclusion derived from the background analysis is that under the present circumstances, public expenditure priorities are fundamental in achieving the environmental targets.

Supporting measures, which would reduce risk and improve feasibility of the proposed policy scenario, would be:

12.1 On the supply side:

- *To strengthen tax collection in order to stabilize the public finances of the Oblast, which should facilitate more emphasis on environmental investments;*
- *To introduce measures to save and/or generate additional public financial resource. This could also include reviewing the current asset portfolio of the Oblast including the housing portfolio;*
- *To strengthen utility tariff collection. The financial "buffers" in the scenario outlined above depend crucially on the ability to collect tariffs. This could be improved by implementing enforcement measures towards bad debtors such as service cut-off;*

- *To review the operating subsidy policy of the Oblast budget. These subsidies could be targeted directly to low-income households instead of utilities, thereby creating fewer distortions in costs and prices of services;*
- *To cover the service expansion by charging connection fees;*

12.2 On the demand side:

- *To reduce water demand e.g.. through the installation of block meters. The latter would also facilitate the generation of improved information about the performance of the infrastructure and better management;*
- *To abandon the norm based system for measuring production and consumption of water for a system based on actual measurements. This is a pre-condition for proper resource and asset management including investment planning.*

The same is the case with respect to solid municipal waste. There is a need to map the existing situation in much more detail in order to channel limited resources to the landfills in most need and optimize economic and environmental return on investments;

- *To move to the much higher sustainable maintenance levels gradually and to support the process by the introduction of systematic maintenance tools such as master plans. However, this also requires much better information about system performance than is presently available;*
- *To promotion more efficient use of the funds available through the introduction of competitive bidding and procurement procedures for goods and services;*
- *To review the present norms and standards for environmental performance. Some of the standards are simply not achievable even with the best available technology, e.g. BOD requirements. Such non-achievable standards weaken incentives for realistic improvements in performance;*
- *To put more efforts into leveraging locally available financing for environmental investments. This would require improvements in projects identification, preparation and marketing;*

Promoting environmental financing in the sectors focused on here would also require institutional and regulatory adjustments:

- *Clearer separation of the utilities and the public sector;*
- *Creation of a suitable corporate-like framework for utility operations, where managers are accountable for performance;*

- *In order to attract additional foreign financing, the region should use its general attractiveness as a "partner" to foreign investors in order to bundle FDI packages, which incorporate environmental features. This also includes the possibilities for BOT schemes in the water, wastewater and waste sectors. This might be the only option for attracting private sector finance and involvement in the light of the present weaknesses of the environmental sectors considered here and the small size of the service area.*

13 Foreseeable obstacles to the strategy implementation

Though it is very desirable to achieve the established environmental targets and they are economically and socially affordable, one can foresee a number of economic, political and other obstacles during the strategy implementation. These inter alia include the following:

1. Lack of public budget resources in the majority of rayons of the Novgorod oblast and instability of current positive economic trends (GDP/GRP and public budget revenues growth) in Russia and Novgorod oblast.
2. It will be rather difficult to review the public expenditure priorities and tariff policies, as it requires strong political will and brings some individual risk for the decision-makers. Implementation of the measures can be delayed, for example, due to forthcoming elections of Heads of rayons and cities Administrations and/or regional Duma members, as increase in tariffs most likely would not be supported by the local electorate.
3. False economic prejudices and concepts widespread among the population, executives and policy makers are also a potential obstacle. That is why the strategy implementation will require significant efforts to increase public awareness through information campaigns. For example, publication of estimates of economic losses caused by the growth of human diseases in Novgorod oblast due to poor drinking water quality, could be part of such efforts.

Nevertheless in the Consultant's opinion these obstacles can be overcome or eliminated if there is concordance among all the Novgorod Oblast stakeholders upon the necessity and ways of the EFS targets achievement, adequate political support and appropriate co-ordination of the strategy implementation.

DATASHEET

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The purpose of the municipal water and wastewater financing strategy for Novgorod region of the Russian Federation is to determine a realistic, agreed and affordable service and to demonstrate how environmental expenditure can be financed. The water and wastewater financing strategy has been developed in an iterative process in a dialogue with the finance, environmental and other relevant authorities. This report presents the final contribution by the consultant.

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