Water Resources in the Russian Part of Barents Region: General Status Overview

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Barents Region (Barents Euro-Arctic Region) comprises the areas adjacent to the Barents Sea and delineated on 11 January 1993 for the purpose of stimulating international cooperation. SLIDE 2

Its area is washed by the Norwegian, the White and the Barents Seas and the Gulf of Bothnia. The Region has a vast area. SLIDE 3

The RF North European part of the Barents Region totals 1329.5 thousand km^2 and includes:

- Arkhangelsk (and Nenets Autonomous Area) accounting for 44.1%;
- Murmansk Region accounting for 10.9%;
- Komi Republic accounting for 31.4%;
- Republic of Karelia accounting for 13.6%.

The major part of coastline belongs to the Barents Sea (Nenets Autonomous Area and Murmansk Region) and the White Sea (Arkhangelsk Region).

Barents Sea (fringing sea). This sea belongs to the Arctic Ocean basin and is situated between Europe's northern shore and the islands of Svalbard, Franz-Josef Land and Novaya Zemlya. The sea is strongly influenced by warm waters of the Atlantic Ocean, which explains why its south-western part never freezes. Inside the Barents, they often separate the so-called Pechora Sea, which occupies the former's south-eastern part and is borderlined by the islands of Vaigach and Kolguev and the south-western part of the Novaya Zemlya archipelago. The water in the Pechora Sea is largely desalted by the Pechora River (mostly flowing in the Komi Republic) and other rivers. The warm Atlantic waters never reach this sea.

White Sea (intracontinental sea). This sea forms a part of the Arctic Ocean basin and is bordered in the north by the Barents Sea. Geologically, it is a depression separated from the Barents Sea by shallow rapids near Gorlo sea gate, which makes it impossible for deep water layers of these seas to exchange. In the north, the Gorlo and Voronka Straits connect the White Sea to the Barents Sea. In the west, the sea is borderlined by Kola Peninsular, in the east – by Kanin Peninsular.

In context of oil-and-gas exploration and development of Northern Sea Route, the arctic areas and shelfs seas have become a special focus.

The main water users operating in the Russian part of the Barents Region include

- power industry and heat engineering plants:

"RosEnergoAtom" branch, "Kola NPP", Cherepovets State District Power Plant, Arkhangelsk Thermal Power Plant, Severodvinsk TPPs 1 and 2, Sosnogorsk TPP, Vorkuta TPPs 1 and 2, etc.;

- pulp and paper mills:

JSC "Arkhangelsk Pulp and Paper Mill", JSC "Ilim Group" (Koryazhma), JSC "Mondi Syktyvkar Timber Processing Complex", JSC "Solombala Pulp and Paper Mill", JSC "Sokol Pulp and Paper Mill", "Sukhonsky Pulp and Paper Mill" Ltd.;

- iron and steel industry:

JSC "Severstal", JSC "Kovdor Mining Processing Plant", JSC "Alcon", etc.;

- nonferrous metallurgy:

JSC "Kola Mining and Metallurgical Integrated Works", JSC "Lovozero Mining Company';

- chemical industry:
JSC “Apatite”, JSC “Ammophos”;
- ship-building yards:
JSC “PA ”Sevmash”, JSC “Zvyozdochka” Ship Repair Center”;
- oil and gas industry (mainly Komi and Nenets Autonomous Area);
- housing and communal organizations supplying water to residents and water users in regional and municipal centers – these mainly include water and wastewater treatment pants and municipal unitary enterprises. SLIDE 5

The statistical data on water consumption in constituent entities of RF which make a part of the Barents Region, has shown a slight decrease in water withdrawal and use since 2007:
- by 1,1% in 2008 (as compared to 2007);
- by 3,6% in 2009 (as compared to 2007).
Arkhangelsk Region has shown maximum decrease – 9.7% as compared to 2007. SLIDE 6

The withdrawn water is used for the following purposes:
- domestic – appr. 10%;
- industrial – 87 %;
- agricultural – 0.1 %;
- other – 2.9 %.
Industrial businesses also use sea water. SLIDE 7

To ensure the sustainable use of water resources, businesses are operating circulation and recycled water supply systems, which enables a decrease in water intake from the water bodies. The freshwater saving achieved due to circulation and recycled water supply systems is estimated around 56% (Arkhangelsk Region – 60%, Murmansk Region – 39%, Komi Republic – 77%, Nenets Autonomous Area – 82%). Such systems are operated by pulp and paper mills, power plants and other enterprises. SLIDE 8

The water volume required by circulation and recycled water supply systems has also decreased – by 5.1% in comparison with 2007 and totals
- 25.6% in Arkhangelsk Region;
- 30.7% in Murmansk Region;
- 43.5% in Komi Republic;
- 0.2% in Nenets Autonomus Area.

The quality of water resources, especially in coastal areas, directly depends on the quality and volume of wastewaters discharged by enterprises, cities and smaller centers of population.

The decreased water intake has resulted in a 3.8% reduction in wastewater discharge. These are public utilities sector and the industry that account for the major volume of wastewaters discharged. Industrial discharges total ca. 92%, the main dischargers being:
- forestry, woodworking, pulp and paper enterprises – 18.4%;
- housing and public utility sector – 7.4%. SLIDE 9

Waste waters are classified into:

- standard-quality (untreated) – ca. 64%
(Arkhangelsk Region – 9.7%, Murmansk Region – 73.9 %, Komi Republic – 16.4 %);

- treated-to-standard-quality – 3.4%
(Arkhangelsk Region – 11.9 %, Murmansk Region – 11.6 %, Komi Republic – 76.5 %);

- insufficiently treated and polluted – 27.2%
(Arkhangelsk Region – 48.7 %, Murmansk Region – 38.2 %, Komi Republic – 12.9 %, Nenets Autonomous Area – 0.2%);

- polluted untreated – 5.4%

(Arkhangelsk Region – 38.6 %, Murmansk Region – 53.2 %, Komi Republic – 8.2 %).

Waste waters are basically treated by biological plants.

Special attention is paid to the record of water being withdrawn from the water bodies – by using water-meter units. The withdrawn water record is ca. 43%.

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The most important instrument in water legislation today is the Water Code (Federal Law 74-ФЗ of 03 June 2006). It specifies the main provisions, legal acts governing the use and ownership of water bodies, state monitoring procedure, water register keeping and liability for water legislation violation. The main document to regulate the procedure of water bodies state monitoring is the Regulation on the State Monitoring of Water Bodies (SMWB), enacted by RF Government Resolution 219 of 10.04.2007 (amended by RF Government Resolution 830 of 17 October 2009). As provided by the above SMWB Regulation, the monitoring will be implemented by Federal Agency for Water Resources, Federal Service for Hydrometeorology and Environmental Monitoring and Federal Agency for Subsurface Resources Management, with participation of executive bodies in RF constituent entities and other state authorities and sub-departmental organizations. Water users also participate in water bodies monitoring. They keep record of water intake, waste water discharge, water quality and regularly monitor the water bodies and their water protection zones. SLIDE 11

For all the stakeholders involved in water bodies management and use to cooperate, there are two basin boards responsible for two basin districts in the Russian part of the Barents Region: Dvina-Pechora district (the board chaired by me – Managing Director of Dvina-Pechora Basin Water Directorate of Federal Agency for Water Resources) and Barents-White Sea basin (managed by Neva-Ladoga Basin Water Directorate). See the SLIDE for structure of Dvina-Pechora basin district.

The main goal for the country's water management sector consists in being able to supply all branches of economy with quality water in sufficient amount. This multiobjective challenge can only be met if agreed and made consistent with the national development strategy. SLIDE 12

In August 2009, the Government Executive Order enacted the RF Water Strategy to 2020. The Strategy defines the main lines of development for Russia's water management complex and, what is more, provides for water resources to be supplied for the purposes of the Conception of Long-Term Social and Economic Development in the period upto 2020 (adopted in November 2008).

The Strategy also contains assessment of the status of the country's water management complex; state monitoring system; water bodies protection and use management; scientific and technical personnel and staffing support for water management complex. There are strategic goals set, priority lines, activities and implementation mechanism developed for the Strategy. There are also the projected target indicators set for the Strategy to be achieved through implementing the planned activities. SLIDE 13

The target indicators also serve the basis for water strategies and programs developed in constituent entities of the Russian Federation (see Table 1).

Table 1

Projected Target Indicators of Water Strategy (expected outcomes)

Indicator	2007 Indicator Value	2020 Indicator Value	Reduction achieved (as compared to 2007)
RF GDP specific water-retaining capacity, m^3/thousand RUR	2.4	1.4	42% reduction
Water losses in transit, km^3 per annum	8.0	4.0	Twofold reduction
Polluted waste waters in total amount discharged, %	89.0	36.0	2.5-fold reduction
Volume of organized pollutants discharge into surface water bodies, mln tons per annum	11.0	6.6	1.7-fold reduction
Damaged hydraulic structures, %	5	0	

The Strategy is to be implemented in two phases.

The resources required to implement the activities are expected to total 662.4 billion RUR, where the allocations from local budgets and those of RF constituent entities amount to 114.6 billion RUR and from extra-budgetary sources – 66.9 billion RUR.

According to the Ministry of Natural Resources and Ecology, the improved environment and water quality the Strategy aims at will result in decreased sickness rate and 2-3 year longer life span. The Strategy will also facilitate better balancing of the territories and national economy branches, prevention of potential losses estimated 989.3 billion RUR and a 20-billion RUR annual reduction in energy consumption by economy.

The target indicators of water management and water quality restoration for Russia to achieve by 2020 will call for scientific approach to regional water strategies and programs to be developed. The development of these programs is to start already in 2009. SLIDE 13

The activities under programs must definitely have a detailed analytical substantiation. Besides, the complete analysis of a single RF constituent entity requires thorough examination of the balance of water resources in river basins and storage reservoirs which are often located within several constituent entities of the Russian Federation. SLIDE 14

In terms of target indicators set in the Strategy, the potential of water complex shared by several RF constituent entities within the jurisdiction of Dvina-Pechora BWD (and generally in North-West Federal District), due to a number of reasons appears more beneficial than in other constituent entities of the Russian Federation. SLIDE 15

Firstly, the economy of North-West Russia doesn't sustain a chronic shortage of water resources.

Despite Russia's highly sufficient availability of water supply, many regions do suffer from the lack of water, as, territorially, surface and underground waters are distributed

unevenly. While approximately 90% of river runoff falls on the Arctic and Pacific Ocean basins, the major hydrotechnical load and water intake are sustained by the Volga River basin.

Whereas Russia's total freshwater intake from water sources accounts for 3% of total water resources, in certain river basins it may go up to 50% or more. In 2007, as compared to 2005, many Russian regions registered a slight increase in freshwater consumption (overall countrywide increase being 0.6%). At the same time, North-West federal district registered a 3.6% increase, which amounts to 11.77 billion m^3, i.e. 19% of Russia's total water consumption.

Lower water content of the local rivers, lakes and storage reservoirs will not restrict the available water supply for citizens and industries. The exceptions are few and are limited to dry years, like 2005, when restrictions had to be introduced for the intake from certain water bodies. At the same time, the areas of North-West Russia have their local regional limitations conditioned by relief structure, hydrology, water storage reservoirs and annual climatic anomalies.

Secondly, since 2000 North-Western enterprises have been speeding up the introduction of circulation and recycled water supply systems, which allowed them to outperform the countrywide average values by over 1.5 times. When calculating specific water-retaining capacity, according to the methods of Ministry of Natural Resources, the water used in circulation and recycled supply systems is not considered. The enterprises therefore have a solid chance to reach the target values set in the 2020 Strategy for water-retaining capacity in the Gross Regional Product. It should be noted that the volume of recycled and reused water has recently reduced all over Russia.

In addition to similar principles of water management, each constituent entity of the Russian Federation has its own specific features and challenges, different from those in North-West Russia. It means they will have their own way of achieving the target values set in Water Strategy. SLIDE 16

Based on Water Strategy provisions, the RF constituent entities will be calculating their own performance benchmarks for the regional water programs.

The 2020 water programs to be developed in the regions must provide for the best available treatment and disinfection techniques and offer non-conventional organizational and regulatory legal instruments to enhance the efficiency of water use.

Moreover, the regional water program must offer a solution to rehabilitating and maintaining water quality in smaller rivers, where most of sewage treatment plants operated by housing and public utilities sector are located.

According to the Strategy, all managerial decisions with regard to saving water resources and maintaining water quality in rivers, lakes and storages will be appraised in terms of sustainable development.

Water users appear interested in water saving only to the extent of benefits it may bring in a given natural and economic environment. Although water-saving technologies do require major one-time investment, they ensure energy efficiency and, as a result, faster return on investment. The less water one uses, the less energy it takes to deliver it through the process flow, etc. In pursuing its economic interests, enterprises convert from extensive to intensive water consumption and, in particular, introduce circulation water supply system.

However, the situation tends to change with time. With constantly increasing water consumption, every new water saving measure appears more expensive and the water user starts to realize that to increase water intake would be cheaper than introduce water-saving technologies.

Economic theory describes the above processes as the “scale effect” and “law of decreasing effect”.

In managing water use systems, state authorities, on their part, are trying to improve water consumption standards, introduce contractual relations and adjust the water tax rate.

Market levers, however, are not that critically important in the natural resources market. These are natural factors, not supply and demand, that cause water deficit.

Natural resources must never be regarded as a tool for industries. They have an important role in preserving the restorative potential of nature itself.

The 2020 regional water programs will prove efficient and practically feasible only if based on the following pillars:

1. Interests of single water users to be subordinate to national priorities. To follow this principle, we will need to:

1.1. adopt managerial decisions on the basis of the Schemes of Multipurpose Water Use and Protection. The Schemes will contain systemized materials of research work and project designs covering the state of water resources and perspective of their use in the current context of new approaches to water use regulation, namely in conditions aimed at:

- maximum reduction of economic activity impact on the water system to retain its natural condition;
- maximum efficient measures to ensure regeneration and rehabilitation of polluted and depleted water bodies.

1.2. to observe the principles of basin management of water resources.

2. Application of the best available water-saving technologies by enterprises; elimination of multiple losses of water in all stages of use; promotion of sustainable domestic water consumption in the areas, where low water rates and missing water-meters do not stimulate water conservation.

3. Introduction of limits of water use and calculation of projected figures (water consumption and discharge volumes) to be observed by enterprises oriented towards both improved technical parameters/output capacity and specific ecological indices.

4. Restoration of the lost ecological balance of the water bodies not only by using environmental (water-saving and treatment) technologies at enterprises, but also through territorial environmental measures of various types – nature-protecting, landscape, nature-rehabilitating.

5. Translating water quality standards onto surface water bodies according to the given typology of water bodies.

6. Introduction of innovative technologies in waste water treatment and disinfection.

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THANK YOU FOR ATTENTION!