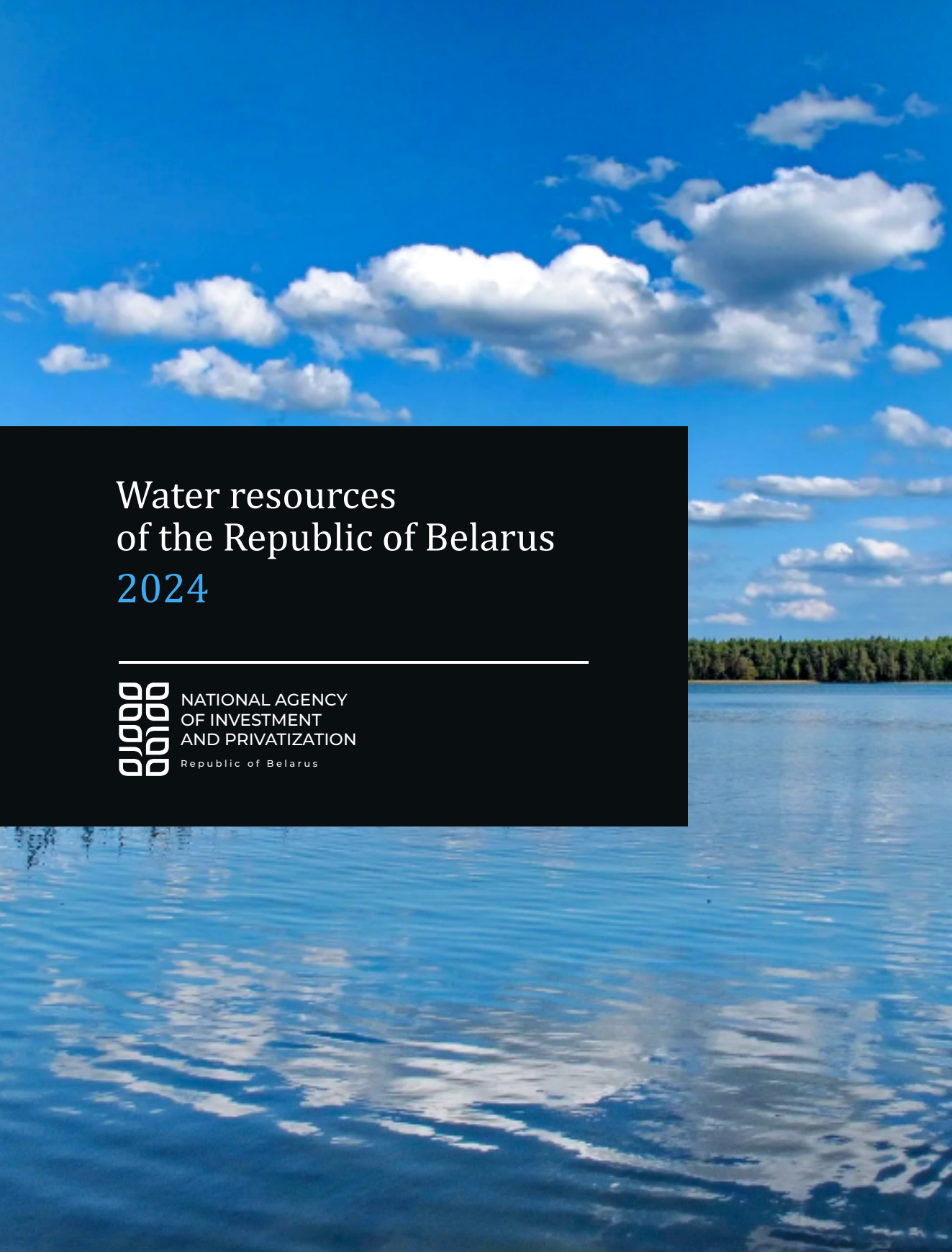


# Water resources of the Republic of Belarus

2024

NATIONAL AGENCY
OF INVESTMENT
AND PRIVATIZATION
Republic of Belarus

# Contents

# 1. The current state of water resources of Belarus

## 1.1. General characteristics of the water fund of Belarus

All waters (water bodies) constitute the State water fund of the Republic of Belarus. The water fund includes: a) surface waters (water bodies) – rivers, streams, springs, lakes, ponds, reservoirs, canals, etc.; b) groundwater. All waters (water bodies) located on the territory of the Republic of Belarus constitute the exclusive state property of the Republic of Belarus.

The peculiarities of the geographical location of Belarus have led to the formation of a developed hydrographic network, including rivers, lakes, canals, reservoirs and ponds. In total, 20,800 rivers and streams with a total length of 90,600 km flow through the territory of Belarus, concentrating about 9 cubic km of water. The Vitebsk and Grodno regions are the most provided with water resources, the Gomel and Brest regions are the least.

The Baltic-Black Sea watershed runs through the territory of Belarus, dividing the country into 2 parts. Most of it (57%) belongs to the Black Sea basin, and 43% belongs to the Baltic Sea basin. The Black Sea basin includes the basins of the Dnieper (the largest in the country) and Pripyat (2nd in area). The basin of the Baltic Sea includes the basins of 5 large rivers: the Neman, the Western Dvina, the Western Bug, the Viliya and the Lovat.

In total, 10 large rivers (more than 500 km) flow in Belarus: the Dnieper, the Berezina, the Pripyat, the Sozh, the Western Dvina, the Neman, the Western Bug, the Lovat, the Goryn, the Viliya. Within the country, the length of the said rivers is significantly less (see table below). Another 41 rivers in Belarus are classified as medium-sized (100-500 km), while the Narev, Styr, Iput, Ptich and Shchara rivers are more than 300 km long. The category of small rivers includes 1,452 rivers with a length of 10 to 100 km, and 19,300 watercourses with a length of up to 10 km belong to the category of streams and together make up 93% of the total number of rivers.

**Rivers of Belarus**

| River | River length, km | | Basin area, km² | |
|---|---|---|---|---|
| | total | within the country | total | within the country |
| Dnieper | 2145 | 700 | 504 000 | 67 460 |
| Western Dvina | 1020 | 338 | 87 900 | 33 150 |
| Neman | 937 | 436 | 98 200 | 34 610 |
| Western Bug | 772 | 169 | 73 470 | 9 990 |
| Pripyat | *761* | *495* | 121 000 | 50 900 |
| Horyn | 659 | 82 | 27 700 | 1 200 |
| Sozh | 648 | 451 | 42140 | 21 700 |
| Berezina | 561 | 561 | 24 500 | 24 500 |
| Lovat | 536 | 47 | 21 900 | 382 |
| Viliya | 498 | 276 | 25 100 | 10 920 |

Of the watercourses, small rivers and streams predominate (about 90%). Their dispersion throughout the territory makes water resources available for widespread use. However, river flow is mainly formed by large and medium-sized rivers, along which large settlements and major industrial facilities are concentrated.

The number of reservoirs to a greater extent (about 90%) is due to their natural origin (lakes). 85 reservoirs with a water surface area of 100 hectares or more have been created on the territory of the country. Off-stream reservoirs are concentrated mainly in the southern part of the republic, and lake–type reservoirs are located in the northern part. There are more than 1,500 ponds, which are mainly used for fish farming, as well as for recreational purposes.

In addition to reservoirs and watercourses, another type of natural water bodies is also widespread in the country – springs. They are very important in terms of an opportunity of being used as sources of non-centralized drinking water supply.



**Ecological state of surface water bodies**

Over the past five years, there has been a tendency to improve the ecological condition of surface water bodies – 72.4% of them have been assigned a good and higher ecological status. 1.2% of surface water bodies (their sections) experience significant anthropogenic stress.

## The qualitative composition of groundwater

The qualitative composition of groundwater, including mineral waters, and their reserves make it possible, in addition to meeting economic and drinking needs, to use such waters for therapeutic (resort, wellness) purposes using more than 30 types of mineral waters, as well as to export water by bottling. By territorial affiliation, fresh groundwater is most intensively used in the Gomel, Mogilev and Minsk regions, while mineral waters are used in the Vitebsk and Minsk regions.

## Balance reserves of fresh groundwater

Currently, on the territory of the Republic of Belarus, the balance reserves of fresh groundwater in the amount of 6.35 million cubic meters/day in categories A+B+C1 (or 2,317.75 million cubic meters/year) have been explored and approved at 609 deposits of fresh groundwater. At 605 fields, fresh groundwater reserves have been explored and approved for household and drinking needs, and four fields for technical purposes. The explored and approved reserves of underground mineral waters amount to about 62.13 thousand cubic meters/day.

## 1.2. Legal framework

Key ideas on managing water resources are presented in **National strategy on managing water resources in under the climate change until 2030.**

**Main goal of the strategy is water security of the country, which includes:**

• guaranteed supply of standard quality water to the population;

• providing sectors of the economy with water, taking into account the effectiveness of its use;

• safe discharge of all types of wastewater into the environment with improved quality of their treatment;

• protection of the life and property of the population, as well as sectors of the economy from the natural emergencies caused by the negative effects of waters.

**Expected outcomes of the strategy:**

• the provision of the population with centralized water supply and sanitation (sewerage) systems is at least 93.2% and 79.3%, respectively, by 2025, 95% and 85%, respectively, by 2030;

• the share of surface water bodies that have been assigned a good and higher ecological status is at least 75% by 2025, 85% by 2030;

• the discharge index of insufficiently treated wastewater into water bodies (by the 2015 level) is not more than 30% by 2025, 0% by 2030;

• the degree of implementation of integrated water resources management is at least 80% by 2025, 100% by 2030;

• the share of the area of transboundary river basins in respect of which international agreements on cooperation in the field of protection and use of transboundary waters are in force is at least 78% by 2025, 100% by 2030.

The main document regulating relations arising from the ownership, use and disposal of waters and water bodies, and aimed at protecting the rights and legitimate interests of water users, is **the Water Code of the Republic of Belarus.**

It establishes programs and measures for the protection and use of waters, water resource management plans, standards of permissible discharges and standards of water use, requirements for the performance of work on water bodies, regimes of economic activity on water bodies.

The Republic of Belarus has also signed a number of international treaties, the implementation of which contributes to the harmonization of the Republic's water legislation with the legislation of the European Union: the Convention on the Protection and Use of Transboundary Watercourses and International Lakes of March 17, 1992, the Protocol on Water and Health, of June 17, 1999.

## 1.3. Research base

At the level of state and other programs, research is primarily conducted aimed at finding innovative solutions in the field of water treatment and wastewater purification technologies, processing and disposal of wastewater sludge, research into the technology of monitoring and forecasting the state of surface and groundwater, including in emergency response, and a comprehensive study of the reactions of aquatic biological resources to natural and anthropogenic changes in aquatic ecosystems in a changing climate.

The National Water Resources Management Strategy defines the main scientific and scientific-technical research on the protection and rational use of waters. They should be aimed at:

- development of existing and creation of new mechanisms for water resources management, allowing to combine all spheres of regulation of water relations with the transfer of functions to one public administration body (Water Committee);
- improvement of economic methods and mechanisms of rational water use;
- scientific provision of conditions for the introduction of the best available technical methods, including the formation of a list of the best existing technologies in the field of water supply, sanitation and wastewater treatment;
- improvement of the accounting system for extracted groundwater, withdrawn surface water and wastewater discharged into the environment, as well as methods of water sampling and measurements in the field of environmental protection;
- development of scientific foundations for monitoring surface and groundwater, automated and information technologies in the field of water use and water monitoring;
- improvement of methods for assessing natural and anthropogenic risks, allowing to reduce damage caused by dangerous natural and man-made phenomena;
- the development of scientific foundations for assessing the transformation of the water regime, changes in the qualitative and quantitative characteristics of the water resources of the territory under the influence of urbanization.

The main scientific and research center in the field of water resources management in Belarus is the **Republican Unitary Enterprise "Central Research Institute for Complex Use of Water Resources" (RUE "TsNIIKIVR").**

The main purpose of the RUE "TsNIIKIVR" activity is to ensure scientific and technological progress in the field of effective use of water resources and their protection from pollution and depletion by developing new methods, technologies and tools and making a profit.

For state institutions and management bodies, RUE TsNIIKIVR performs the following types of work:
1) development of databases, information systems and management decision support systems in the field of State Water Cadastre;
2) development of technical regulatory legal acts in the field of use and protection of water resources;
3) assessment of the current state of water resources in connection with global climate change, including issues of water resources protection;
4) training of highly qualified researchers through postgraduate studies.

For local executive and administrative bodies:
1) development and scientific support of water resources management plans for river basins;
2) development and adjustment of projects for water protection zones and coastal strips of water bodies;
3) implementing works on the inventory of water bodies of the Republic of Belarus.

Также научные изыскания в смежных областях проводит Институт природопользования НАН Беларуси, Институт жилищно-коммунального хозяйства НАН Беларуси и Государственное учреждение “Республиканский центр по гидрометеорологии, контролю радиоактивного загрязнения и мониторингу окружающей среды”.

For businesses and organizations:

1) development of environmental impact assessment projects for engineering activities in river basins, including the placement of hydroelectric power plants;

2) conducting a strategic environmental assessment (SEA) and developing an environmental report on SEA;

3) providing methodological and practical assistance in the organization and implementation of wastewater and surface water accounting systems;

4) comprehensive assessment of the environmental impact of enterprises and rationing of water use at enterprises;

5) development and justification of standards for maximum permissible discharges of pollutants into water bodies and municipal sewerage systems;

6) development of instructions for the organization of industrial environmental control at the enterprise;

7) calculations of standards of technological water consumption in municipal water supply systems;

8) calculations of the standard of losses and unaccounted water consumption from municipal water supply systems;

9) assessment of the possibility of placing (reconstructing) economic and other activity facilities in water protection areas with the development of a set of water protection measures;

10) development of draft justifications of boundaries of mining allotments of underground water supply sources;

11) assessment of the volumes of unorganized additional water inflow entering the municipal sewerage systems of populated areas, development and justification of measures to reduce its flow into municipal sewerage systems;

12) assessment of the environmental condition of facilities for storage, transportation and distribution of petroleum products.

## 1.4. Staffing

Personnel training is implemented within the framework of the specialties "Environmental protection activities" and "Water supply, sanitation and protection of water resources". The objects of professional activity of specialists are water supply and sanitation systems and technologies; sanitary and technical equipment systems of buildings and structures; engineering systems and technologies for water resources protection; systems and technologies for the construction of building objects; research and development methods in the field of natural and technical sciences.

The main higher education institutions that train specialists are the International Sakharov Environmental Institute of Belarusian State University (Faculty of Environmental Monitoring), Brest State Technical University (Faculty of Engineering Systems and Ecology), Belarusian State Technological University (Faculty of Chemical Technology and Engineering), Belarusian National Technical University (Faculty of Power Engineering), Belarusian State University of Food and Chemical Technologies (Faculty of Mechanics).

These universities provide training for specialists in postgraduate education programs. Postgraduate education programs are also implemented by the RUE "TsNIIKIVR" and the Institute of Nature Management of the National Academy of Sciences of Belarus.

According to 2022 data, 40.1 thousand people (0.95% of the total number of employees) were employed in the "Water supply; waste collection, treatment and disposal, pollution control activities" industry. 93.8 thousand people (2.23% of the total number of employees) were employed in the industry "Supply of electricity, gas, steam, hot water and air conditioning".

## 1.5. Technologies

In Belarus, the principle of basin management of water resources has been developed, which involves the river basins management and the improvement of the ecological status of surface water bodies. This enables to increase the country's water security and defines the main technologies in water treatment, water supply and sanitation.

At present, the population and organizations of the republic consume water from both underground and surface sources.

**Artesian water**
(underground water sources)

Water from artesian sources is mainly supplied to consumers without additional purification and chlorine treatment. However, some aquifers are characterized by an increased content of iron and manganese. Water from these intakes comes to de-ironing stations located at pumping sites, where it is aerated and filtered, which reduces the residual concentration of iron and manganese in the water when supplied to consumers to 0.1 mg/dm$^3$.

**Water from a surface source**
(surface water source)

Water from a surface source, a reserve reservoir, is supplied via gravity aqueducts to a water treatment plant, where it is purified prior to being supplied to the water supply network.

Water purification involves the following technologies:
1) **chlorination** – disinfection of water with sodium hypochlorite;
2) **coagulation** is applied to accelerate the deposition process in sedimentation tanks and more complete extraction of particles during filtration (enlargement, clumping of impurities, formation of flakes). A modern automated process control system has been introduced to automate the process.

## 2. Characteristics of the hydrographic network of Belarus

An important hydrographic indicator is the density of the river network showing the length of watercourses per unit area. The average density of the river network in Belarus is 0.44 km/km$^2$ (for comparison, the average density of the river network in Russia is 0.3 km/km$^2$). It varies significantly in different regions of the country from 0.52 km/km$^2$ in the north-west of Belarus to 0.26 km/km$^2$ in the south-east.

The relief of Belarus has determined the lowland nature of the rivers of the country. The average slopes of small rivers can reach 2-3 m/km, in medium-sized rivers they decrease to 0.5–0.8 m/km, and in large ones - 0.1-0.2 m/km. Accordingly, the average river flow rate also changes: 0.8-1.5 m/sec, 0.5-0.7 m/sec, 0.1-0.2 m/sec.

The entire water mass of rivers and streams forms a river flow, the total volume of which in Belarus is 57.7 km$^3$. It is partly formed due to atmospheric precipitation (36.4 km$^3$), partly brought by rivers from outside the country. The share of transit flow is 21.3 km$^3$. River runoff caused by atmospheric precipitation, in turn, is divided into surface (23.4 km$^3$) and underground (13 km$^3$). Due to uneven precipitation over the years, river runoff fluctuates by +-30%.

## Characteristics of river basins

**The Dnieper basin** covers an area of 63.7 thousand km² (without Pripyat), which is more than 30% of the territory of Belarus. The source of the Dnieper is on the Valdai Hills in Russia, the mouth is the Dnieper estuary of the Black Sea. The total length of the river is 2,145 km, in Belarus – 700 km. The largest right tributaries of the Dnieper are the Drut and the Berezina, the left tributary is the Sozh. The average density of the river network is 0.39 km/km². In places of close occurrence of Devonian deposits in the Dnieper valley, the Kobelyak and Streshinsky rapids were formed. The average annual flow of the basin rivers ranges from 7 l/s from 1 km² (the sources of the Berezina) to 3 l/s from 1 km² on the border with Ukraine.

**The Pripyat basin** covers an area of 50.9 thousand km² (25% of the country's territory). The source of the river is located in the Volyn region, and the Pripyat flows into the Dnieper near the Kiev reservoir. The total length of the river is 761 km, of which 495 km in Belarus. The Pripyat has more than 800 tributaries, the largest of which are: Styr, Goryn, Stviga, Ubort, Slovechna (right), Pina, Yaselda, Sluch, Ptich (left). The average density of the river network is 0.4 km/km². The average annual river flow ranges from 6 l/s from 1 km² in the north of the basin (the sources of the Ptich) to 3 l/s from 1 km² – in the latitudinal area of the Pripyat.

**The Neman basin** covers an area of 34.6 thousand km² (17% of the territory of Belarus). The source of the river, Nemanets, is located in Belarus near the Verh-Neman village of the Uzda district at an altitude of about 180 m, and the Neman flows into the Curonian Lagoon of the Baltic Sea. The total length of the river is 937 km, of which 436 km in Belarus. The largest right tributaries of the Neman in Belarus are the Western Berezina, Ditva, Kotra, and the left – Shchara, Zelvyanka. The average density of the river network is 0.47 km/km². The average annual flow of the basin rivers is 5-6 l/s from 1 km².

**The basin of the Western Dvina** covers an area of 33.2 thousand km² (16% of the territory of Belarus). The Western Dvina originates from Lake Karakino in Russia and flows into the Gulf of Riga of the Baltic Sea. The total length of the river is 1020 km, within Belarus – 338 km. The largest right tributaries are: Usvyacha, Obol, Polota, Drysa, left – Kasplya,

Luchesa, Ulla, Ushacha, Disna. The average density of the river network is 0.45 km/km$^2$. The average annual flow of the basin rivers is large – 6-8.5 l/s from 1 km$^2$.

**The Western Bug basin** covers an area of 10.0 thousand km2 in the south-west of the country (5% of the territory of Belarus). The source of the river is on the Podolsk upland in Ukraine, and the mouth is in the Zegrze Reservoir in Poland. For 169 km, the Bug is a border river with Poland. The total length of the river is 772 km. The right tributaries are the Mukhavets and the Lesnaya. The average annual flow of the basin rivers is 4 l/s from 1 km$^2$.

**The Viliya basin** covers an area of 11 thousand km$^2$ (5% of the country's territory). The Viliya is an tributary of the Neman, but flows into it on the territory of Lithuania. The source of the river is located near Velikoye Pole village of the Dokshitsy district, and Viliya crosses the border with Lithuania in the Ostrovets district. The total length of the river is 498 km, of which 276 km in Belarus. The right tributaries of the Viliya are Servech, Naroch, Stracha, the left are Ilia, Usha, Oshmyanka. The average annual river flow is 6-8 l/s from 1 km$^2$.

**The Lovat basin** occupies the smallest area of 382 km$^2$, which is 0.2% of the territory of Belarus. The river originates from Lake Zavesno in Gorodok district and flows into Lake Ilmen in Russia. Lake Ilmen belongs to the Baltic Sea basin and is connected to it through the Volkhov and the Neva Rivers. The total length of the river is 536 km, while in Belarus it is only 47 km. The average annual river flow is 8 l/s from 1 km$^2$.

**The Berezina basin** covers an area of 24.5 thousand km$^2$ and is part of the Dnieper basin. The source of the Berezina is southwest of Dokshitsy, and the mouth is on the Dnieper north of Rechitsa. The total length of the river is 561 km (2nd longest in Belarus). It is the largest river located entirely from source to mouth in Belarus. The right tributaries are Gaina, Plissa, Svisloch, the left – Bobr, Klyava, Olsa. The density of the river network is 0.35 km/km$^2$.

The river system includes 425 rivers with a total length of 8,490 km. The average annual river flow is from 7 l/s from 1 km$^2$ in the north, to 4 l/s from 1 km$^2$ in the south.

The natural hydrographic network of Belarus is complemented by canals that were built for transport purposes and connected the waterways of the the Baltic and the Black Seas.

## Canals

**The Dnieper–Bug (Royal) Canal** is the largest in Belarus with a length of 196 km. It connects the Pina River (a tributary of Pripyat) and the Mukhavets River (a tributary of the Western Bug). The construction of the canal and hydraulic structures was performed in 1775-1843. Subsequently, several reconstructions were implemented on the canal. The canal is still being used for transportation purposes.

**The Berezina water system** has a total length of 166 km. It passes through the lakes Plavno, Beresch, Lepelskoye. It connects the Berezina (Dnieper) and the Ulla (Western Dvina) rivers. The construction of the water system was performed in 1798-1812. The canal was used for transportation purposes and timber rafting until the early 20th century.

The Dnieper–Bug (Royal) Canal

Berezinskaya water system, Lake Plavno

**The 54 km-long Oginski Canal (Dnieper-Neman Waterway)** was built on the initiative of Slonim magnate Michal Oginsky for use for transport purposes and timber rafting. It connects the Shchara River (a tributary of the Neman) and the Yaselda River (tributary of Pripyat). The construction was performed in 1767-1783. It passes through the Lake Vyganoshchanskoe. Now it is used as a water intake for reclamation channels.

**The Augustow Canal** with a total length of 102 km (22 km in Belarus) was also of transport importance. It connects the Neman River and the Chernaya Gancha River (a tributary of the Bebzha and then the Vistula). The Canal was built in 1824-1839, and in 2004-2006 the reconstruction of the Belarusian part of the canal was made. It is currently used for recreational purposes.

**The Viliya-Minsk water system was built in 1968-1976.** This is a very complex hydraulic engineering structure with a length of 62 km. It connects the Viliya River (tributary of the Neman) and the Svisloch River (tributary of the Berezina and the Dnieper). The water system includes the largest reservoirs in the country (Vileyskoye and Zaslavskoye), 5 pumping stations that raise water by 75 m. The water system is used for the water supply of Minsk.

The 7 km-long **Mikashevichi Canal** was built in 1974-1980 to remove rubble from the Mikashevichi quarry. It connects the Pripyat River and the Granit Production Company (Mikoshevichi) and is quite intensively used for transport purposes at the present.

Vileika-Minsk water system, the Svisloch River

Oginsky Canal

**Lakes and reservoirs**

In order to solve water management tasks on the territory of Belarus, artificial water bodies were created: reservoirs and ponds. Reservoirs include water bodies with the volume of water more than 1 million $m^3$ and area of more than 100 hectares, and ponds less than
1 million $m^3$ and less than 100 hectares.

There are more than 150 water reservoirs on the territory of Belarus, with a total water surface area of 834 $km^2$, and more than 1500 ponds, with a total area of about 300 $km^2$. Reservoirs are distributed unevenly. Their greatest number is in the Pripyat and Dnieper basins, where there are few large natural lakes.

According to the type of formation reservoirs are divided into in-stream, lake and off-channel reservoirs. The most widespread in Belarus are in-stream reservoirs (52%),
the share of lake reservoirs is 35% (mainly in Vitebsk region) and off-channel reservoirs 13% (mainly in Brest region). The purpose of water reservoirs is related to their use: water supply, landscaping, irrigation, fish farming, recreation.

In terms of water volume, 16 reservoirs contain more than 50 million $m^3$ of water each, including Vileika 260 million $m^3$, Lukomsk 243 million $m^3$, Zaslavsk 109 million $m^3$ and Osveisky 104 million $m^3$.

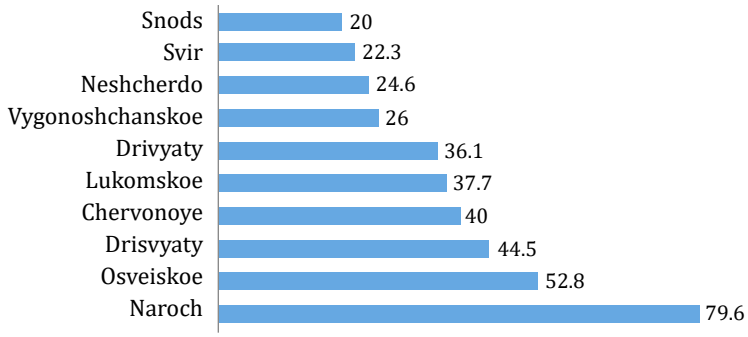
**Characteristics of the largest water reservoirs in Belarus**

| Name | Area, km$^2$ | Volume, million m$^3$ | Depth, m | River, district | Type |
|---|---|---|---|---|---|
| Vileika | 63.8 | 238 | 13 | Viliya | In-stream |
| Zaslavsky | 26.9 | 103 | 8 | Svisloch | In-stream |
| Krasnoslobodsk | 23.6 | 69.5 | 5.5 | Moroch | In-stream |
| Soligorsk | 23.1 | 55.9 | 4.5 | Sluch | In-stream |
| Lubanskae | 22.5 | 39.5 | 6.3 | Oressa | In-stream |
| Chigirinskoye | 21.2 | 60 | 9.1 | Drut | In-stream |
| Selets | 20.7 | 56.3 | 5.4 | Yaselda | In-stream |
| Pogost | 16.2 | 54.5 | 6.0 | Pinsk | Lake |
| Loktyshi | 15.9 | 50.2 | 4.9 | Lan | In-stream |
| Svetlogorskoye | 14.1 | 60 | 5.1 | Svetlogorsk | In-stream |
| Zelvenskoye | 11.9 | 28 | 7.5 | Zelvyanka | In-stream |
| Osipovichi | 11.9 | 17.5 | 8.5 | Svisloch | In-stream |

## Lakes groups

A distinctive feature of Belarus is the large number of lakes different in area, depth and origin, so it is characterized by high lakes. There are about 10,780 lakes in the country. The total volume of water mass of all lakes in the country is about 7 km$^3$, and the total area of their water surface is about 1.6 thousand km$^2$.

**The area of lakes in Belarus, km sq.**




The area of lakes in Belarus varies from 0.01 km$^2$ to 79.6 km$^2$. Small lakes prevail. The share of lakes with the area of less than 1 km2 is about 90%, the share of lakes from 1 to 5 km$^2$ is about 9% and only 470 lakes have the area over 5 km$^2$.

The largest lake in terms of its water surface area is Lake Naroch (79.6 km$^2$), another 5 lakes (including the boundary lake Drisviaty) have an area of over 30 km$^2$. Only 22 lakes in Belarus have an area of more than 10 km$^2$.

An important indicator for determining water resources is the volume of water in lakes, which varies from 0.0001 to 710 million m$^3$. Lakes with the volume of water less than 10 million m$^3$ prevail in Belarus - 86%, and only 1% of lakes have more than 100 million m$^3$. The biggest volume of water is in the lake Naroch - 710 million m3, then follow the lakes Lukomskoje 249 million m$^3$ , Drivyaty 224 million m$^3$ and Ritchi 132 million m$^3$.

Lakes also differ in depth, which includes 2 indicators: maximum and average depth. The maximum depth of lakes in Belarus varies from 0.3 to 53.6 m. About 40% of the lakes have a maximum depth not exceeding 5 m, and 11% – more than 20 m. The deepest is Lake Dolgoye (Glubokoye district) with a depth of 53.6 m; more than 50 m is the depth of Lake Richy. More than 80 lakes have a depth of over 20 m.

Lakes are distributed unevenly across the territory of Belarus, therefore, the lake coverage varies from 0.01 to 12%. Within the Lake district (North of Belarus), the average lake coverage is about 2.3%, and within lake groups up to 12%. In the central regions of Belarus, the lake coverage is about 1%, and within the Belarusian Polesie – 0.2%, despite the large number of ancient lakes and the presence of large residual lakes. In places, the lakes are located in groups.

**The Braslav group of lakes** is located in the Braslav district, in the Druika River basin and includes 31 lakes with a total area of 113.2 $km^2$. The total water volume is more than 540 million $m^3$. The lakes depth is from 6 to 40 m. The largest lakes are Drivyaty, Snudy, Strusto, Nedrovo, etc. The catchment area is 808 $km^2$. The lake coverage is about 12%.

**The Naroch group of lakes** is located in the Myadel district, in the Naroch River basin and includes lakes Naroch, Myastro, Batorino and Pale, with a total area of about 100 $km^2$. The water volume is more than 800 million $m^3$. The lakes depth is from 4 to 24.8 m. The catchment area is 279 $km^2$, and the lake coverage is about 10%.

**The Ushachy group of lakes** is located in the Ushachy district, in the basin of the Turovlyanka and the Diva rivers. It includes more than 60 lakes with a total area of 75 $km^2$ and a water volume of more than 350 million $m^3$. The lakes depth is from 6 to 26 m. The largest lakes are: Cherstvyaty, Krivoe, Paulskoye, Otolovo, Yanovo, Gomel, etc. The catchment area is 803 $km^2$, and the lake coverage is up to 10%.

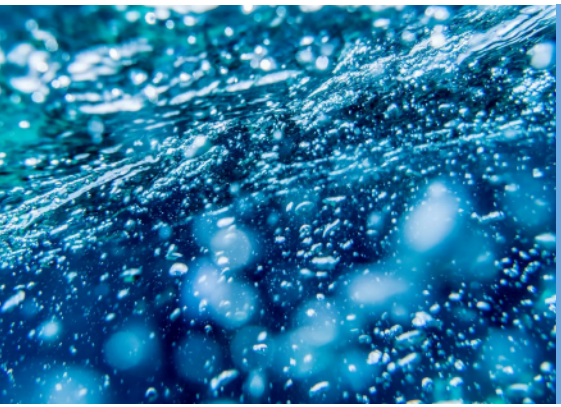
**The Obsterno group of lakes** is located on the border of the Braslav and Miory districts, in the basin of the Kharabrovka and the Vyata rivers. It includes 13 lakes with a total area of 32 $km^2$ and a water volume of 140 million m3. The depth of the lakes is 25 m. The largest lakes of the group are Obsterno, Uklya, Nobisto, etc. The lake coverage is 8%.

# 3. Provision of water resources

## 3.1. General characteristics of water resources provision

The main challenge in the context of ensuring water security is finding a balance between economic needs and environmental considerations regarding the use of water resources. Globally, the most important challenges include the shortage of freshwater compared to existing and projected demand, and the inefficient use of water for irrigation in the agricultural sector. In addition, many regions, including the EU, due to the high concentration of industrial activities, are faced with the need to reduce the negative impact of industrial wastewater discharges on the environment. Belarus has a high level of specific water availability compared to global averages and less intensive industrial activity compared to the EU. The biggest challenge for the country is to improve the efficiency of water use by end users, especially households and water-intensive industries such as food production.

In Belarus, the share of water consumption for agricultural needs (36%) is lower than the world average (69%), but higher than the European average (25%), while the share of water consumption for industrial needs (25%) is higher than the world average (19%), but more than two times lower than in Europe (54%). The main water consumers in Belarus are households (39%), which significantly exceeds the average levels of water use in Europe and the world (21% and 12%, respectively).



The indicator of water resources availability in the country (based on the average long-term total annual river flow) is 6.1 thousand cubic meters of water per year per capita and is at the level of the average European value. This is much higher than in some neighboring countries (Poland and Ukraine).

Households are the main water consumers in Belarus, ahead of industry and agriculture, in the structure of water consumption of which the main volume of fresh water is used for the needs of fish pond farming. Water consumption by fish pond farming is several times higher than water consumption by other sub-sectors of the country's agriculture.

However, the administrative regions of Belarus and the districts differ significantly in terms of water availability. The population and economy of the country are concentrated in the central region of the country – the Minsk region. However, the availability of surface water in this region (on average 7.6 $km^3$/year) is lower than in neighboring regions, especially in comparison with the eastern regions: Mogilev (14.6 $km^3$/year), Vitebsk (18.1 $km^3$/year) and Gomel (31.5 $km^3$/year). However, in terms of groundwater availability, the Minsk region as a whole is in the lead (10,700 $m^3$/day), as well as Vitebsk (10,260 $m^3$/day). Explored reserves of groundwater in other areas are much smaller.

## 3.2. Key indicators of water resource flow accounts

The water flow account describes the flows (in millions of cubic metres) that reflect the water withdrawal from the environment, the use of water in economic activities, and the return of water to the environment.

Water withdrawal from the environment includes water taken from surface water bodies and extracted from underground water bodies, including estimated data on water taken by households living in apartments (houses) not equipped with running water.

**Water resources flows, million $m^3$**

| | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|
| Water withdrawal from environment | 1 417.2 | 1 407.7 | 1 364.8 | 1 333.7 | 1 428.8 |
| including from: | | | | | |
| surface water objects | 586.2 | 581.1 | 555.9 | 529.4 | 612.1 |
| ground water objects | 831.1 | 826.7 | 808.9 | 804.3 | 816.7 |
| Distribution and use of withdrawn water | 1 266.5 | 1 264.8 | 1 222.5 | 1 194.3 | 1 283.4 |
| Wastewater in wastewater treatment plants | 685 | 684.1 | 681 | 671.8 | 684.8 |
| Return water flows to environment | 1 096.3 | 1 064.8 | 1 040.8 | 1 027.3 | 1 084.0 |
| Including: | | | | | |
| to inland water resources | 10 753 | 1 045.8 | 1 020.0 | 1 007.0 | 1 064.3 |
| Including: | | | | | |
| surface water objects | 912.3 | 897.3 | 881.1 | 869.1 | 921.2 |
| ground water objects | 163 | 148.5 | 138.9 | 137.9 | 143.1 |
| Evaporation of withdrawn water, transpiration and water in products | 321 | 342.9 | 324 | 306.4 | 344.8 |

BWater for distribution and use, i.e. water directly involved in the economic activity of the country, is the volume of water taken from the environment, minus losses and unaccounted expenses, as well as water withdrawn not for use (for example, mining). Wastewater in wastewater treatment plants represents the volume of wastewater passed through wastewater treatment plants, treated using soil purification methods and other methods of purification in natural conditions.

Return flows of water to the environment reflect the volume of both used and unused water returned to the environment, as well as its losses and unaccounted expenses. The volume of evaporated withdrawn water, transpiration, and water remaining in the products represents the difference between the volume of water withdrawn from the environment and the return flows of water into the environment.

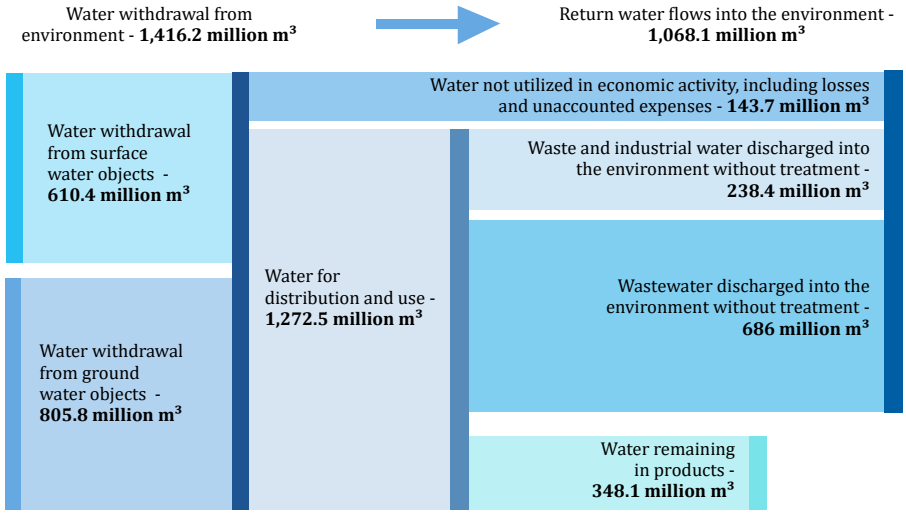
Over the period 2018-2022, the volume of water waithdrawal from the environment increased by 0.60%. At the same time, there is a decrease in the intake from underground sources by 2.53% and an increase in the intake from surface objects by 5.04%. The percentage of distribution and use of the withdrawn water remains at the level of 89-90%. The volume of wastewater in wastewater treatment plants remains at the level of 53-54% of the water distributed and used in economic activities. At the same time, the return flows of water into the environment account for 75-77% of the water intake.

The largest volume of water is taken by water supply, collection, treatment and disposal of waste (40.39% – 22.97% of them from surface waters, 77.02% from groundwater); agriculture, forestry and fisheries (27.14% – 65.95% and 34.05%, respectively); manufacturing (14.27% – 50.98% and 49.02%, respectively%).

The largest volume of water withdrawn for distribution and use falls on agriculture, forestry and fisheries (30.79%); manufacturing industry (15.50%); supply of electricity, gas, steam, hot water and air conditioning (9.41%).

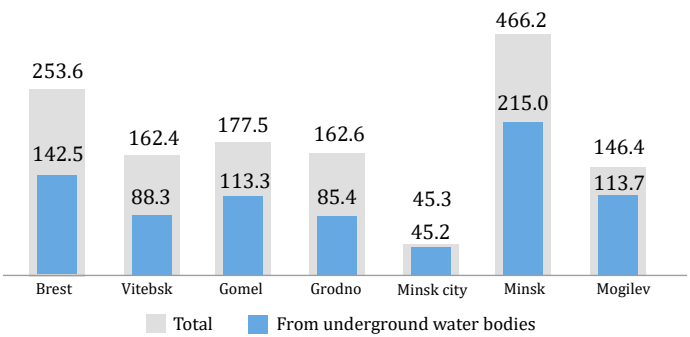
The largest volume of wastewater in wastewater treatment plants accounts for water supply, collection, treatment and disposal of waste (71.15%); manufacturing industry (14.10%); supply of electricity, gas, steam, hot water and air conditioning (9.31%).

Visually, water use in the republic looks as follows.




**Extraction (withdrawal) of water from natural sources by regions and the city of Minsk in 2022**

(million cubic meters)

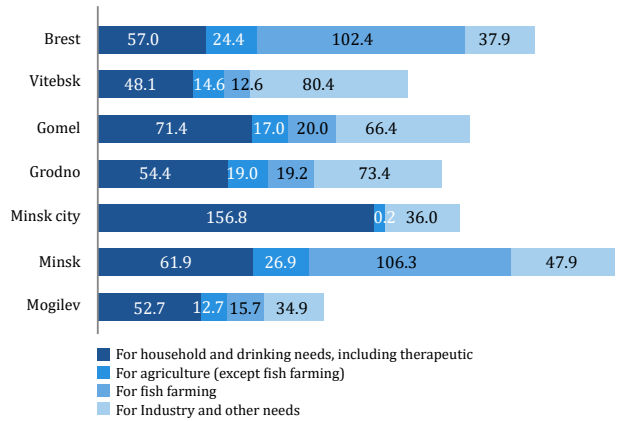



The largest volume of water extraction from natural sources is in Minsk region (about 33% of total extraction). In Brest region - about 18%, in Gomel region - about 13%. In Minsk city about 3% is extracted, but almost entirely from underground water bodies.

The structure of water consumption varies by region. Thus, in Minsk, Gomel and Mogilev regions, the bulk of water is used for household and drinking needs, in Brest and Minsk regions – for fish farming needs, in Vitebsk and Grodno regions – for industrial needs.

**The use of waters by regions and the city of Minsk in 2022**

(million cubic meters)



## 3.3. Engineering infrastructure

The established capacity of the centralized water supply systems of the republic is greatly overestimated and amounts to 4.3 million m3 of water per day, whereas on average only 1.6 million m3 of water per day is supplied, i.e. slightly more than 1/3 of the installed capacity is used. The system consists of 10,197 water intake artesian wells, 598 de-ironing stations and 38,200 km of water pipelines and water supply networks. The level of physical deterioration of most of the water supply system (42-43%) often leads to a deterioration in the quality of tap water.

Despite the use of centralized water supply and sanitation systems of excessive capacity in the country as a whole, the population of many small rural settlements does not have access to centralized drinking water supply systems.

## 3.4. Efficiency and intensity of water resources withdrawal (use)

The efficiency of water withdrawal (use) is calculated as the ratio of the economic result (for example, gross domestic product, gross value added) to the volume of water resources involved in economic activity (for example, to the amount of water withdrawal from the environment).

**Efficiency of withdrawal (use) of water resources**

| | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|
| Republic of Belarus | 59.3 | 61.6 | 64.5 | 65.7 | 62.6 |
| including: | | | | | |
| agriculture, forestry and fisheries | 15.8 | 15.9 | 18.5 | 19.4 | 17.1 |
| mining industry | 19.9 | 16.3 | 18.7 | 20.2 | 20.9 |
| manufacturing industry | 108.3 | 114.4 | 110.3 | 109.7 | 111.7 |
| supply of electricity, gas, steam, hot water and conditioned air | 17.6 | 19.5 | 20.1 | 23.1 | 23.8 |
| water supply; collection, treatment and disposal of waste, activities of elimination of pollution | 1.3 | 1.3 | 1.3 | 1.3 | 1.2 |
| construction | 355.4 | 458.2 | 480.5 | 279.3 | 326.5 |
| services sector | 1 502.6 | 1 691.1 | 1 750.4 | 1 876.3 | 1 933.4 |

The positive dynamics of the indicators reflects an increase in the efficiency of water withdrawal (use) over time and indicates a weakening of the relationship between economic growth and water consumption, although it does not always indicate a reduction in total water consumption or a reduction in the negative consequences of water use.

The highest efficiency in the use of water resources is observed in the service sector, construction and manufacturing industries, the lowest – in the field of water supply, waste collection, treatment and disposal; agriculture, forestry and fisheries, as well as in the supply of electricity, gas, steam, hot water and air conditioning.

The intensity of withdrawal (use) of freshwater reserves is characterized by an index of water resource exploitation, as well as water consumption per capita.

**Intensity of water resource withdrawal (use)**

| | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|
| Renewable freshwater resources (total river flow), cubic meters | 60.4 | 55.0 | 37.3 | 38.1 | 49.8 |
| Renewable freshwater resources (total river flow) per capita, thousand l/day | 17.5 | 16.0 | 10.8 | 11.1 | 14.7 |
| Water resource exploitation index (by annual flow), percent | 2.3 | 2.6 | 3.7 | 3.5 | 2.9 |
| Water withdrawal from the environment per capita, l/day | 410.5 | 408.6 | 396.9 | 389.5 | 420.8 |

The water resources exploitation index is calculated as a percentage of the amount of water withdrawal from the environment to the amount of renewable freshwater resources. In turn, renewable freshwater resources include water flows formed on the territory of the country and coming from the territory of neighboring states, collectively representing the total river flow.

The value of the water resources exploitation index is interpreted as follows:
• less than 10% – low water stress, available water reserves are not subject to serious stress; - 10-20% – moderate water stress;
• 20-40% – medium-high water stress;
• above 40% is acute water stress, characterized by depletion of water consumption.

In other words, a high level of water stress reflects a lack of water. According to the data, water stress in Belarus is weak, which means there is no water shortage.

# 4. Water Market Overview

## 4.1. The main global trends

Water is a renewable resource. It is estimated that about 25% of the available renewable freshwater resources are now being used. If current per capita consumption continues, by 2050 the use of the world's fresh water reserves due to population growth alone will reach 70% or more. Thus, over the past 80 years, the total consumption of fresh water has increased 10-fold while the population has increased 2.5-fold. At the same time, only 35 $km^3$ of fresh water is available, which is 2.5% of all water sources in the world. Fresh water, suitable for household and drinking consumption, makes up 0.1% of the total balance of the planet's water reserves.

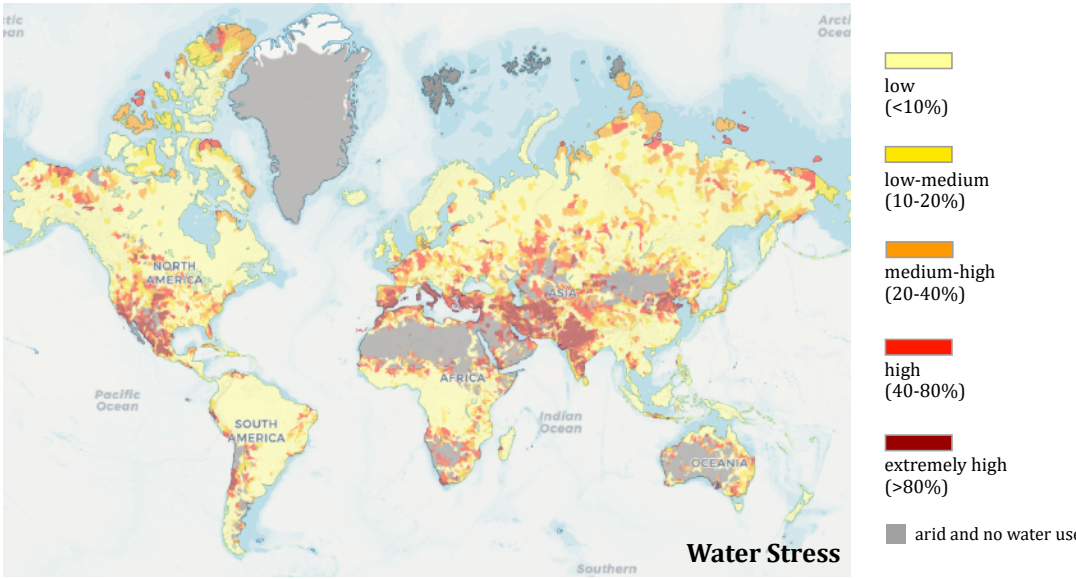
The structure of the world's freshwater resources is as follows: snow and glacial covers (Arctic, Antarctic, Greenland) – 69%; groundwater and groundwater available for extraction – 30%; rivers, lakes, reservoirs – 0.5%. At least 65-70% of all precipitation goes back into the atmosphere and falls again. About 2,100-2,500 $km^3$ is replenished every year. However, the total amount of remnants is unevenly distributed. In percentage terms, the ocean and sea surface accounts for 79%, the land surface – 19%, rivers, lakes, reservoirs – 0.5%.

Taking into account the size of the territories and their hydrological characteristics, the regions of the planet differ significantly in terms of water resources (%): Latin America – 30-32; Asia – 25; countries of the Organization for Economic Cooperation and Development (OECD) – 20; countries of sub-Saharan Africa and countries of the former Soviet Union – 10 each; countries of the Middle East and North America – 16 each. The most provided with water resources ($km^3$) are Brazil – 8,233, Russia – 4,508, USA – 3,051, Canada – 2,902, Indonesia – 2,838, China – 2,830, Colombia – 2,132, Peru – 1,913, India – 1,880, Congo – 1,283, Venezuela - 1,233, Bangladesh – 1,211, Myanmar – 1,046. There is a significant shortage of fresh water in the states adjacent to the territory of the Great Sahara: the whole of North Africa, the center of Australia, South Africa, the Arabian Peninsula, Central Asia, and Mexico. There are practically no own water resources in such states as ($m^3$/person): Kuwait – 11; Egypt – 43; United Arab Emirates – 64; Moldova – 225; Turkmenistan – 232.

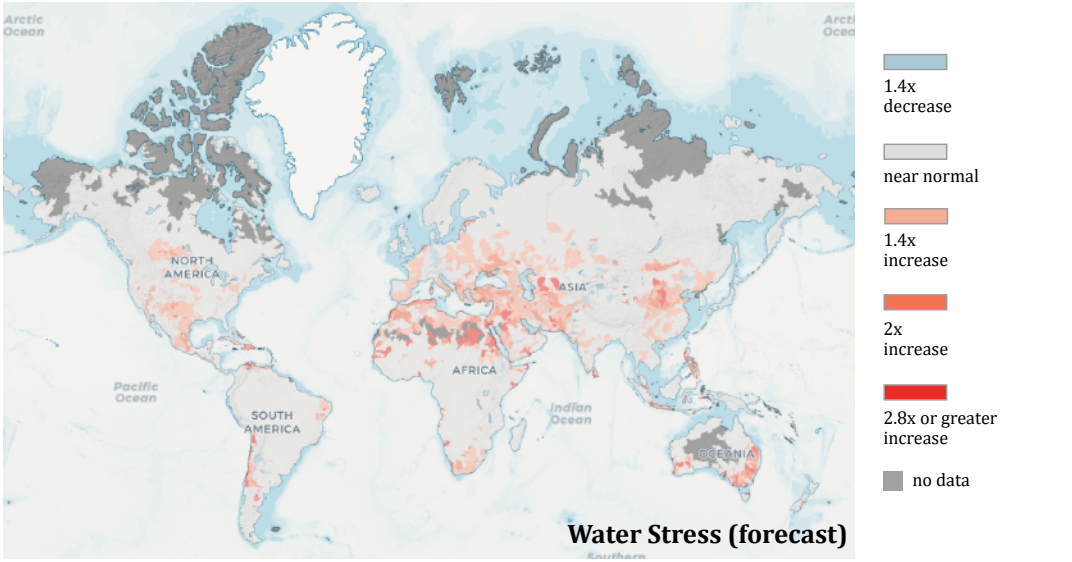
The amount of water that goes to personal consumption depends on the region and living standards in the country. Over the past 10 years, it has ranged from 20 to 500 liters per day per person. A significant amount of water is also used to provide people with food. Per person with a traditional diet for industrialized countries, 2.5-3 thousand $m^3$ of water is consumed daily.

Such trends lead to water scarcity – water stress. As a result, the cost of water resources increases every year. According to the standards calculated by UNESCO, the use of more than 10% of annual freshwater reserves is considered critical. Currently, the intensity of water resources used in a number of countries has irreparably exceeded the thresholds set by the world community (%): Egypt – 97; Israel – 84; Germany – 27; USA – 19.

Water stress in the global context is shown below.

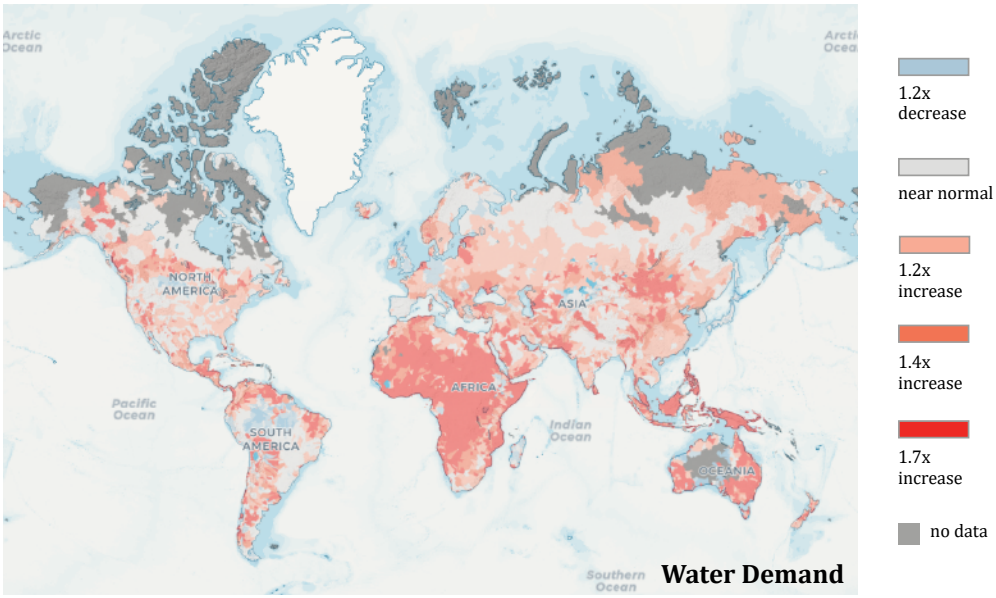



According to optimistic forecasts, the change in the level of water stress by 2050 will be as follows.



Water stress will increase 1.5-3 times in Southern and Northern Africa, Southern and Western Europe, West, Central, parts of Eastern, Southern and Southeast Asia.

This situation also determines the demand for water (calculated on the basis of water intake / water demand).



**Water Demand**

Everywhere, the demand for water will grow by 1.2-1.7 times. The exception will be the countries that are most provided with water resources.

The increase in demand is explained by the fact that the main water consumption falls on agriculture, energy, industrial production and municipal water consumption. Of these, more than 70% of the water is taken by agriculture. That is, the more food is produced, the higher the water consumption. This is especially true for those countries that use hydroponics – Israel, the countries of the Arabian Peninsula, South Africa. High volumes of future water consumption are a function of future food production. This idea is embedded in the concept of virtual water – water that went into creating a finished product (for example, a cup of coffee is 140 liters of water, a hamburger is 2,600 liters of water).

Energy is impossible without water, since water is the main heat carrier and driving force (hydropower). The extraction of mineral and raw energy resources also requires significant amounts of both groundwater and surface water. Moreover, a large amount of unusable water is formed in the energy sector (for example, mine water).

Industrial production is an active consumer of natural water. The largest volume is consumed by the steel, chemical, petrochemical, pulp and paper and food industries.

Consumption in the public sector depends on the level of urbanization and the number of urban population. More than half of the population lives in urban agglomerations, where public utilities are mostly overloaded and about 20% of citizens do not have access to quality water. The final estimate of the average annual water consumption by residents of agglomerations is 292 tons of water per person per year, of which water consumption is 0.5 tons of water per person per day; the volume of sewage is 0.3 tons of water per person per day.

As a result, high-quality drinking water is a commodity. In the price structure of agricultural goods, energy, industrial production and public utilities, water occupies a significant amount. For example, in 2013, Israel used to buy Turkish water at USD 0.7 per cubic meter; in early 2022, the purchase price was USD 0.92 per cubic meter.

In 2022, the profit of companies engaged in the sale of drinking water amounted to about USD 2 trillion/year. The global bottled water market is expected to reach USD 403.5 billion by 2026, increasing at a CAGR by 14.1%.

The global drinking water market is controlled by ten major corporations. The largest of them are Vivendi Universal (Veolia Environment), Suez (Suez Environment), Saur Group, Thames Water (RWE), Bechtel-United Utilities.

World leaders Vivendi Universal and Suez Environnement deliver drinking water to more than 200 million consumers in 150 countries. For example, Veolia Water provides water and performs wastewater treatment for residential buildings and businesses. The company's balance sheet includes water supply for drinking water alone for more than 103 million people, and wastewater treatment for 70 million people from estimated discharges. The company's turnover is over 12.6 billion euros. Veolia Water is present in the markets of 69 countrie.

Tanker, pipeline and hydraulic engineering supplies are a promising market for the sale of natural drinking water. This market is at the stage of formation. The most popular selling scheme is the sale of water supply services. The sale of water can take place as part of the joint use of transboundary water resources. For example, reservoirs and hydraulic facilities are located in one country, and the main user and payer for water resources is another country. At the moment, Turkey is the leader in the tanker supply of drinking water. The main buyers are Israel, France, and Southern Cyprus.

Examples of direct interstate sales of non-bottled water not encouraged by the UN and its committees – states in arid climate zones:

1. Iran and Kuwait have signed an agreement to supply water via a 540-kilometer pipeline from the Iranian Karun River to Kuwait. The deal was concluded for thirty years for the supply of river water in the amount of 90 million m3/year. The contract value is USD 2 billion.

2. In 2014, Turkey completed the construction of a water pipeline that connected the country with Northern Cyprus. The project cost is USD 484 million. The volume of water pumping is 75 million cubic meters of water per year.

3. In 2002, Israel and Turkey signed a 20-year contract for the river water supply from the Manavgat River, Turkey, to Israel. It provides for the supply of 50 million m3/year of water for USD 35 million.

4. Turkey and Jordan have signed an agreement - the Disi Amman Water Conveyor Project. The Project completed in 2013, its total cost was USD 1.1 billion. The volume of pumping was 100 million cubic meters of water per year.

One of the striking examples of domestic water supply projects is the project of transferring water from the Yangtze River to the northern regions of China in the amount of 250 km3/year to meet the water needs of the developing economy and population. To date, the construction of the central route has almost been completed, and the other two routes – east and west – are scheduled to be commissioned in 2030.

## 4.2. Belarus' foreign trade in water

The export and import of water (without sugar and sweeteners) is implemented according to HS codes 220110 "Mineral and carbonated waters" and 220190 "Other waters, including natural or artificial mineral waters."

Mineral and carbonated water exports account for an average of 82% of the waters, while other waters account for 18%. The main exports (on average 98% of total water exports) are to Russia, Latvia, Lithuania and Ukraine. In the period from 2017 to 2021, water was exported in the amount of slightly more than USD 30 million. In 2021, water was exported for USD 7.3 million (in 2017 – 4.4 million dollars).

The entire range of countries exporting water (in thousands of US dollars) is given in the table below.

**Export of water**

Top 5 countries in 2021, thousand dollars

| Trade partner | 2021 | Share of the country in total water exports |
|---|---|---|
| Russia | 4007.9 | 55.0% |
| Latvia | 1250.7 | 17.2% |
| Ukraine | 1148.9 | 15.8% |
| Lithuania | 773.0 | 10.6% |
| Estonia | 19.9 | 0.3% |

Imports of mineral and sparkling waters account for an average of 73.5% of waters, while other waters account for 26.5%. The main imports - an average of 93% of the total imports of waters - account for Russia and Georgia, and taking into account France, Italy and Ukraine - 99%. Between 2017 and 2021, just under $89 million worth of water was imported. In 2021, $19.7 million worth of water was imported ($13 million in 2017).

Imports by trading partner country in thousands of dollars are shown in the table below.

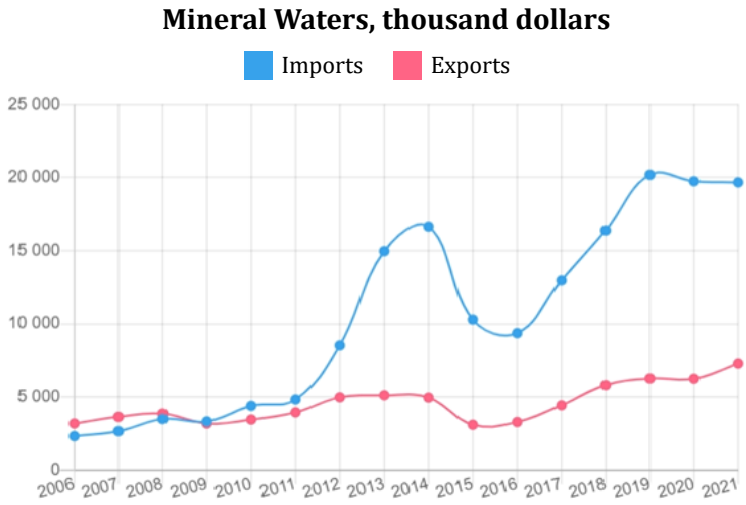
**Import of water**

Top 5 countries in 2021, thousand dollars

| Trade partner | 2021 | Share of the country in total water imports |
|---|---|---|
| Georgia | 9 441.4 | 48.0% |
| Russia | 8 981.2 | 45.7% |
| France | 628.7 | 3.2% |
| Italy | 290.1 | 1.5% |
| Ukraine | 180.4 | 0.9% |

In general, the import of water under the HS code 2201 “Mineral waters” exceeds exports by an average of 3 times. This trend began to reveal itself in 2011.

Thus, Belarus has quite a significant potential for import substitution of mineral water.




## 4.3. Key producers of mineral and drinking water in Belarus

About 40 producers are engaged in the production of waters in Belarus.

Main producers: Darida Private Enterprise, Minsk Crystal Republican Unitary Enterprise, JSC Gomel Distillery "Radamir", AquaTriple LLC, Malinovshchiznensky Distillery ”Aquadive” LLC, Vitebsk Distillery”Pridvinye” JSC, Minsk Plant of Soft Drinks CJSC, Coca-Cola Beverages Belarus uNitary Enterprise, Frost Joint Venture.

As a rule, these are food industry enterprises that produce alcoholic and non-alcoholic beverages.

# 5. Investment potential and “water prospects”

## 5.1. Investments and investment attractiveness of the industry

**Hydropower**

In Belarus, there are opportunities for more efficient use of water resources potential at various levels. In 2016-2020, TsNIIKIVR conducted a large-scale study to reassess the hydropower potential of medium and small rivers in Belarus that are promising for the placement of hydroelectric power plants. The studies were implemented in the basins of the Western Dvina, Dnieper, Pripyat, Neman and Western Bug. As a result, 1,170 promising sites were identified for installations placement on 267 medium and small rivers of Belarus.

The study showed that the estimated hydropower potential of medium and small rivers totals 294.3 MW. Taking into account the hydroelectric power plants already located and planned to be located on large rivers (the Neman, the Western Dvina and the Dnieper), such a potential of all rivers in Belarus is 441 MW. The most promising for the hydroelectric power plants construction is the basin of the Western Dvina, the upper part of the Dnieper basin and the lower part of the Neman basin. These territories are characterized by favorable relief and good water supply.
In 2023, hydroelectric power plants in Belarus generated more than 300 million kW.electricity consumption. In total, there are 53 hydroelectric power plants in the country with a total capacity of about 96 MW.

**Water transport**

Another opportunity for the efficient use of water resources is the development of inland water transport, as well as lake and river tourism and recreation. This fact is well illustrated by the viability of existing canals in Belarus, which are used both for industrial purposes and for tourism and recreation.

Витебская ГЭС

**Bottling of waters**

Belarus has significant reserves of environmentally friendly groundwater. In terms of the ion content and mineral composition, Belarusian waters are divided into several classes: bicarbonate, sulfate, chloride, and complex composition. Some waters have biologically active components that increase their value: hydrogen sulfide, iron, bromine, iodine, fluorine. Waters with a high content of iron, hydrogen sulfide, sodium bicarbonate, silicon and other useful elements from the point of view of mineralization in the future could become attractive for the development of domestic business. The reserves of such waters are located in four artesian basins: the Baltic, Orsha, Pripyat and Brest. However, they are used by 2-3%, mainly for domestic needs, despite the huge export potential.

Most of the deposits are ready for development: 408 freshwater deposits and 246 mineral deposits. This is about 15% of the potential reserves. There are 262 fresh groundwater deposits and 136 mineral water deposits in operation. Fresh water is most intensively used in the Gomel, Mogilev and Minsk regions. Mineral water – in Minsk and Vitebsk. The greatest variety of groundwater is observed in the Brest and Gomel regions.

It is economically advantageous to develop sources located closer to the earth's surface. In places where there are springs, wells have been drilled, or deposits may exist, there is often no infrastructure. If it exists, the chances of developing the deposit significantly increase. Regional surveys are financed from the budget, and specific exploration work is implemented at the request of a potential investor and at their expense.

The dynamics of bottling of fresh and mineral waters, including the volume of waters and soft drinks production, is shown in Annex 2.



sanatorium Porechye

**Recreation, sports and tourism**

Belarusian mineral waters have medicinal properties. This can be used in tourism – the construction of a sanatorium / health resort next to a source of mineral water. A striking example is the Porechye sanatorium – it is located on the same water horizon with Druskininkai.

## 5.2. The export potential of the industry and prospects for the industry development

**Bottling of waters**

Water belongs to the soft drinks industry. The water market capacity is growing globally and amounts to about USD 250 billion. The leaders in consumption are the USA, China, Western Europe and Latin America. The European market is geographically close to Belarus. In Europe, the export value of water from environmentally friendly sources reaches USD 800 per ton. The export price of a ton of water from Belarus reaches an average of 300-350 dollars, and the price of imported water is 900-1000.

If the delivery distance exceeds 400 kilometers, the price for the consumer increases by 30%. In the cost structure of a bottle of water, the cost of water in it is about 1%. About 7-9% are expenses related to bottling, containers, and packaging. The remaining costs are certification, logistics, transport, and marketing. It should be noted that the soft drinks production in the country is low-margin, with an average profitability of -2 to +3%.

Currently, Belarus produces about 40 liters of bottled water per person. In general, the capacity of the Belarusian market is about 0.4 million cubic meters per year in terms of bottling of fresh water and 0.14 million cubic meters in terms of bottling of mineral water. 80% of the market is occupied by domestic producers (Darida, Minskaya, Frost), the rest is accounted for by foreign producers. The latter, as a rule, sell their products through retail.

A promising niche is the extraction and bottling of ultra-fresh waters. They have lower mineralization (up to 100 mg/l) than drinking water (3 times). Such waters are found only in some areas of Polesie (in the interfluves of the Stviga and Ubort, Sluch and Ptich, Tsna and Lan). Over the entire distribution area, ultra-fresh water is used for the needs of domestic drinking water supply and is operated using mine wells and artesian wells. Such sites have been established within the Lelchitsy and Zhitkovichi districts of the Gomel region, Luninets district of the Brest region and some others.

Ultra–fresh water is a valuable natural resource. It is actively used for bottling all over the world (in Finland, Germany, Italy, France, Great Britain). The most famous springs are the springs of the Spa resort in Belgium. The Belgian Spa Reine is one of the well–known brands of bottled ultra-fresh drinking water. Another famous brand is the Norwegian water "Voss".

Both in terms of mineralization and the content of the main components of the chemical composition and pH value, the waters of European countries are similar to our ultra-fresh waters. The lowest mineralization found in Belarusian ultrapressure waters is 15 mg/l. Such water is ideal in the preparation of food for infants, since milk mixtures already contain a set of components necessary for the baby and therefore it is advisable not to use water with increased mineralization in this case.

For this reason, ultra-fresh water is in special demand on the world market. And the price of such a product is high. However, it is necessary to study the reserves of such waters and their chemical composition.

Currently, ultra-fresh water is imported to Belarus from abroad. The development of own deposits requires investment flows, including research of water reserves. According to preliminary estimates, this is millions of tons of ultra–fresh water. Moreover, ultra–fresh water is a renewable resource.

**River navigation**

The total length of Belarus' navigable waterways is about 2,135 km. However, the share of water transport in the country's total cargo turnover is less than 1%, while in EU countries water transport accounts for 10 to 40%. Moreover, according to the Decree of 28 February 2008 No. 133 “On the accession of the Republic of Belarus to the European Agreement on Main Inland Waterways of International Importance”, Belarus must support the possibility of passage of vessels with a draft of 2.5 m during 60 percent of the navigation period along the international route E-40, connecting the Black and Baltic Seas, which is not currently being done. The restoration of this water transport connection increases the transit attractiveness of this route, connecting Belarus, Ukraine and Poland. The route could become one of the main trade and tourist routes in Europe (more than 2000 km long). However, there are some pitfalls here – part of the route passes through the Chernobyl Nuclear Power Plant exclusion zone (70 km), through the territories of specially protected areas, natural and archaeological monuments.

**Hydro and thermal power**

In Belarus, a number of hydroelectric power plants have been built on the Neman and Western Dvina rivers. The estimated hydropower potential is a total of 294.3 MW, including 124.1 MW for the Dnieper basin, 71.1 MW for the Western Dvina, 53.6 MW for the Neman, 41.1 MW for Pripyat, 4.4 MW for the Western Bug. However, since 90% of the water flow is made up of small rivers, the development of small hydropower has become a promising direction. Belarus is an innovator in the construction of small hydropower plants. For example, only in Minsk there is a cascade of 5 small hydroelectric power plants operating in automatic mode.

Separately, it is worth noting that the first private mini-hydroelectric power plant was built in 2017. It is located on the Issa River on the site of an inactive hydraulic engineering structure that previously belonged to the Slonim cardboard and paper mill "Albertin". The capacity of this HPP is 200 kW/h. A little more than 415 thousand dollars were spent on construction. Now the mini-hydroelectric power plant provides electricity to 25 houses in the Albertin microdistrict of Slonim. The experience of such installations in neighboring countries shows that payback of such projects is 5-6 years, and their resource is 40-50 years.

Another promising area is the use of underground heat from deep aquifers using modern heat pumping units. As the practice of EU countries shows, the use of waters with a temperature of 7-10°C is sufficient for heating low-power consumers (for example, such as the private sector). At the moment, the total capacity of such geothermal installations exceeds 4 MW. At the moment, there are several points on the earth's surface in the republic that are close to underground hot water sources (in the Brest and Gomel regions, the depth is up to 1.5 km). About 200 heat pumps have already been installed and are operating in the country.

Assistance in the hydropower projects development (in general, any energy projects) is provided by the Renewable Energy Association. For reference: the installed capacity of renewable energy facilities in Belarus has increased 5 times over the past 9 years – from 120 MW to 608 MW by the end of 2022. The volume of renewable energy production increased from 274 to 1275 million kWh.

**The use of surface water bodies for recreation, sports and tourism**

Surface water bodies are used for recreation, sports and tourism. Such objects are indicated in the Water Cadastre and are determined by decisions of local executive and administrative bodies. Currently, the most promising area is medical and recuperative. The potential of river waters is being used insignificantly. Priority is given to lakes around which the infrastructure for recreation has not developed. At the moment, just over 50 lakes are involved in the industry. However, given that there are 1.5 thousand lakes in the country, the recreational potential is huge. Fishing, including sportfishing, is also a promising area.

# 6. Investment climate

## General guarantees

**Belarusian legislation provides the following basic guarantees to investors:**

- the right of private property and its protection without discrimination
- protection against illegal actions of state bodies, which violate rights of investors and/or cause losses
- equality of rights for national and foreign investors
- free repatriation of profits
- protection of investments against nationalization and requisitioning

By law, nationalization can only be carried out on the basis of public necessity and subject to appropriate compensation. Compensation for nationalized property must be paid in a timely manner and include the value of the nationalized property and other losses caused by nationalization. The legislation also establishes a number of circumstances under which requisitioning is possible. These are mainly emergencies such as natural disasters, accidents, epidemics and epizootics, as well as when the public interest requires these measures.

## Investment agreement

- VAT deduction in full amount
- exemption from import duties and taxes on import of technological equipment, raw materials and materials into the territory of the Republic of Belarus
- exemption from reimbursement of losses in forestry and agricultural production

## Small and medium-size cities, rural territories

- exemption from income tax for 7 years
- exemption from real estate tax for 7 years
- exemption from import customs duties on imported (imported) goods contributed to the statutory fund, from the date of manufacture of which not more than 5 years have passed for some commodity items
- exemption from profit tax in the part of profit received from sale of goods of own production; exemption from income tax for 7 years

## Bremino-Orsha

- 0% VAT and duty on customs
- 0% corporate tax for 9 years
- 0% property tax for 20 years
- 0% VAT for 15 years at realization, rent (leasing) to residents of real estate objects till 1 January 2033
- 0% income tax, tax on dividends and similar income for 5 years from the announcement of profits (for the founders of resident companies and joint ventures)
- 0% tax on dividends and similar income from the date of declaration of profits up to 1 January 2033 (for joint ventures if accrued from a management company)
- 5% on royalties until January 1, 2028

## Industrial park "Great Stone"

- exemption from income tax on revenue from the sale of goods (works, services) of own production within ten years from the date of registration as residents
- exemption from property tax on properties
- exemption from tax on land plots
- until 1 January 2027, the income tax rate is 9%
- full deduction of VAT amounts charged for imported goods (works, services) as well as property rights used in designing, construction and equipping of buildings and structures in the Industrial Park
- exemption from customs duties and VAT on goods (production equipment, components and spare parts, materials and raw materials) imported to Belarus for the implementation of investment projects

## Free economic zones (FEZ)

- exemption from profit tax when selling products for export and to other FEZ residents
- exemption from real estate tax on properties in FEZ within three years of registration
- exemption from land tax and land lease for the period of design and construction, but for no longer than 5 years from the date of registration. Exemption irrespective of the direction of their use (if sold for export or to other FEZ residents)
- exemption from payment for the right to conclude a land plot lease agreement

The choice of preferential treatment will depend on a number of factors and components of the investment project, such as the need to create infrastructure facilities, export orientation of the project, implementation of innovative technologies and many others.

More detailed information about the business environment, investment opportunities in the Republic of Belarus can be found on the website of the National Agency of Investment and Privatization of the Republic of Belarus at www.investinbelarus.by/en/business-environment, as well as to get necessary advice and assistance in implementation of the investment project in Belarus by contacting representatives of the Agency at the contacts specified on the website www.investinbelarus.by/en/contacts.

## 7. Investment projects for implementation in the Republic of Belarus

Investment projects and proposals for implementation in the industry:

**1. Artesian well of mineral water**
*The project venue:* the territory of the industrial site No. 2 of JSC Vityaz, 34 P.Brovka str., Vitebsk.
*Total investment costs:* 3.5 million euros.

Project description: the company offers joint production of mineral water. There are wells of artesian water (depth 104 m, well debit – 120 cubic meters/h, put into operation in 2008) and mineral water (depth 535 m, well debit – 6 cubic meters/h, degree of mineralization – 15 g/cubic decimeters). The chemical composition of the water corresponds to the best samples produced in the republic. Areas are reserved for the organization of production – up to 19,000 sq.m. (reconstruction is required). The proposed forms of investment: creation of joint production, lease, sale.

**2. Artesian well of mineral water**
*The project venue:* the territory of VNN-Plus LLC, Belynichi, Mogilev region.
*Total investment costs:* 1.2 million euros.

It is proposed to extract and pour mineral water at a well with a depth of 248 m, the well debit is 72 cubic meters/h. The water belongs to the category of medium mineralization. To organize the production of mineral water bottling, VNN-Plus LLC has extensive production (800 $m^2$) and warehouse (1000 $m^2$) areas where the appropriate processing line can be placed and storage of finished products organized.

**3. Construction and organization of the work of the medical and health complex "Living Water" in combination with a workshop for the extraction and bottling of mineral and drinking water.**
*The project venue:* Klichev district of Mogilev region, the right bank of the Olsa River.
*Total investment costs:* USD 25 million.

Project concept: medical and wellness complex "Living Water" (land area of 35 hectares, located on the right bank of the Olsa River); sports and tourist complex "Living Voda" (land area of 25 hectares, located on the bank of the rowing canal); water extraction enterprise (three wells with mineral and drinking water, including mineral water of small 4 (g/cubic decimeter) and high mineralization (10 g/cubic decimeter). The project also involves the construction of a solar power plant – the electricity produced will be used for the needs of a complex with the sale of surplus electricity to an energy supply organization – an agricultural complex with an automated complex of greenhouses for year-round cultivation of environmentally friendly vegetables, greens, mushrooms and berries.

**4. Establishment of an enterprise for the extraction and bottling of natural fresh and children's drinking water of the highest category.**
*The project venue:* village of Sredniye Pechy, Lelchytsy district, Gomel region.
*Total investment costs:* USD 1,7 million.

The main goal of the project is to develop deposits of ultra–fresh and fresh drinking groundwater with mineralization from 15 to 50 mg/l.

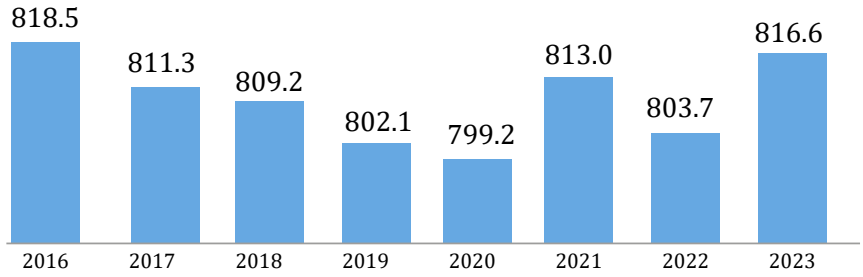
**5. Creation of a new enterprise for the production and bottling of mineral water in PET bottles.**
*The project venue:* Komarovka village, Brest region.
*Total investment costs:* USD 1.5 million.

The planned land acquisition of an industrial site is ≈1 ha. The well depth is 916-957 meters. The operational reserves of underground mineral waters are determined in the amount of 2,700 $m^3$/day. According to the degree of complexity of the geological and hydrogeological regime, the explored deposit belongs to the 1st group. According to the conclusion of the Belarusian Research Center of Neurology and Neurosurgery, the mineral well belongs to the group of low-mineralized bromine chloride magnesium-calcium-sodium waters, with a mineralization of 3.77-3.87 g/$dm^3$; according to the temperature regime - warm (subthermal).

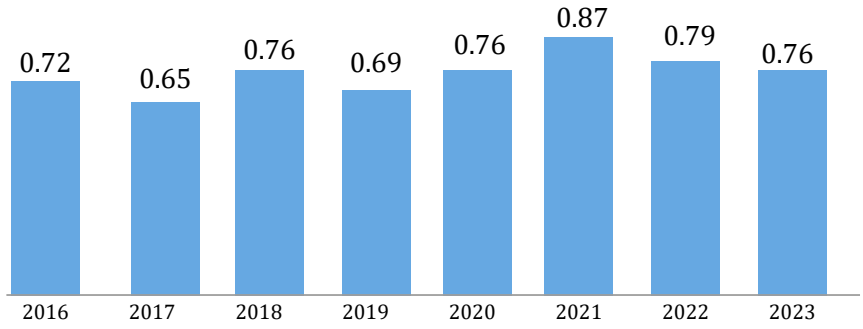
# 8. Annexes

## Materials of the section "Water and Business" of the Belarusian Investment Forum in Gomel

### Annex 1



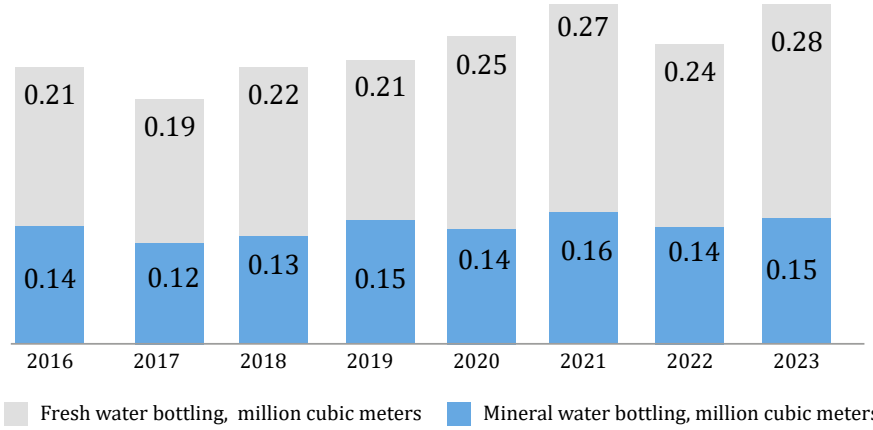

**Groundwater extracted, million cubic meters**




**Mineral water extracted, million cubic meters**

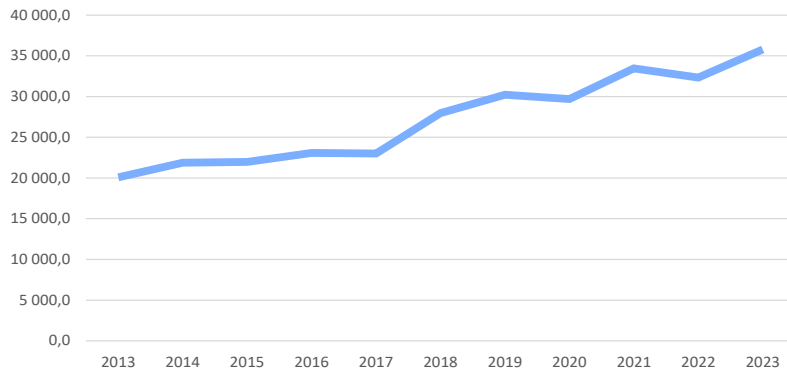
Source: I.A. Bulak, Central Research Institute for Complex Use of Water Resources

# Annex 2

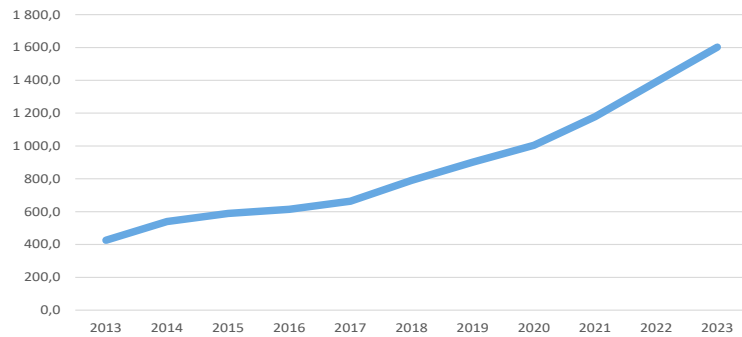



**Dynamics of fresh and mineral water bottling in Belarus**

Source: I.A. Bulak, Central Research Institute for Complex Use of Water Resources



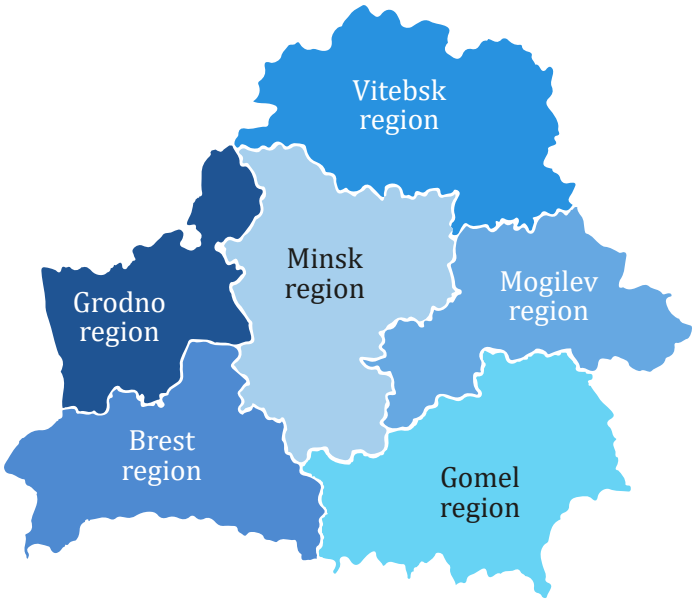

**Mineral and drinking water in bottles (total, thousands of decalitres)**




**Non-alcoholic drinks (total, million rubles)**

Source: V.V. Volchkov, economic observer for the newspaper "Respublika", publishing house "Belarus Segodnya" (Belarus Today), according to Belstat.

## 9 Investor Roadmap




**Investment projects and PPP**
>1000

**Investment ideas**
>700

**Concessions**
9

**Manufacturing sites and real estate**
>900

**Land plots**
>1000

**map.investinbelarus.by**

More investment projects and ideas, as well as land plots and real estate objects for the implementation of investment projects can be found on the interactive portal "Investor's Roadmap"

# National Agency of Investment and Privatization

**The Agency is a state institution that provides assistance at no cost or foreign investors interested in launching a business in Belarus:**

- provision of information about investment opportunities, preferential regimes and benefits granted, economic sectors and legislation
- provision of up-to-date information about investment projects
- assistance in selection of sites and premises
- search for prospective partners for investment projects, arranging meetings and negotiations for establishing cooperation
- providing a platform for negotiations and support during negotiations
- organization of visits to the Republic of Belarus (schedule development, visa support)
- representation of investor's interests during negotiations with governmental representatives concerning implementation of investment projects, as well as improvement of investment climate in the Republic of Belarus
- aftercare

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