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Belarus Energy Profile

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Belarus Energy Profile

Country overview

[The Republic of Belarus](#) (Belarus) is a landlocked country in Eastern Europe, bordered by the Russian Federation (Russia) to the north and east, Ukraine to the south, Poland to the west, and Lithuania and Latvia to the northwest. Belarus covers an area of 207 595 square kilometres (km²) (40% of which is forested) and has 9.4 million inhabitants. Minsk, the largest city, is the national capital and home to 21.5% of the population; 77.6% of the population is urban and 22.4% is rural.

Belarus has a diversified industrial profile. Despite a lack of natural resources and the economic crisis that followed dissolution of the Soviet Union, Belarus has achieved solid economic growth through manufacturing and exports, including machinery and equipment, mineral products, chemicals, metals and textiles. Real gross domestic product (GDP) in US dollars (USD) at purchasing power parity (PPP) was USD 60.45 billion in 2019, an increase of 3% since 2010.

However, little structural reform has occurred in the country since it gained independence, and foreign investment is relatively low. The long-time president opposes privatisation of state enterprises, so the energy sector is owned and operated by the government and the president holds the exclusive right to make all strategic decisions. The electricity sector is operated by a single vertically integrated national energy company, [BelEnergo](#), while gas distribution is handled by [BelTopGaz](#). The government believes that having control over the entire energy sector will guarantee a secure and stable energy supply.

Because of its modest natural resources, Belarus relies on imports from Russia to meet most of its energy needs. Belarus is also an important part of Russia's gas transit corridor to Western Europe, and matters related to natural gas transit, such as infrastructure, system operations, tariff structure and technical services are established in a bilateral agreement with Russia's [Gazprom](#).

The main priorities of Belarusian energy policy and strategy are to provide reliable and sustainable energy for the national economy while reducing energy import dependence and improving the sector's financial stability. The government is contemplating power generation fuel diversification to include more coal and

renewables, and it has introduced a green feed-in tariff (FIT) to attract more investment in renewables.

The government is also improving energy efficiency in electricity and heat production and is phasing out subsidies for electricity, heat and gas, which is expected to make the energy sector more market-focused and attractive for private investment.

While Belarus's energy policy do have direction, strong legislation and implementation tools are lacking. Long-term policy planning and/or analysis of different scenarios are needed to develop government programmes. Furthermore, a basic law on electricity and heat does not exist. At the end of 2019, the government was considering new legislation on electricity that includes provisions for unbundling, but this legislation is under consideration only.

Belarus participates in the Russia-Belarus-Kazakhstan-Kyrgyzstan-Armenia Customs Union, which evolved into the Russia-Belarus-Kazakhstan-Kyrgyzstan-Armenia Common Economic Space (CES) in 2012, directed by the [Eurasian Economic Commission \(EEC\)](#) (to which Belarus is a party). The CES aims to remove barriers to the free movement of goods, services, capital and labour among its members. Belarus is also a member of the Eurasian Economic Union (EAEU), operational since January 2015, along with Russia, Kazakhstan, Armenia and Kyrgyzstan.

In addition to its bilateral relations and work performed as part of the Baku Initiative, which provides political dialogue between the European Union and the countries of the Caspian and Black Sea littoral states and their neighbouring countries, Belarus participates in the European Commission's Eastern Partnership programmes.

Belarus is involved in implementing numerous interstate and international treaties in energy, including participation in the [Commonwealth of Independent States \(CIS\)](#) agreement on the co-ordination of interstate relations in the power sector, and the treaty on the parallel operations of [power systems of the CIS](#).

Key energy data

Supply

- In 2018, only 15% of the country's energy demand (27 million tonnes of oil equivalent [Mtoe]) was met by domestic production, making Belarus one of the least energy self-sufficient countries in the world.
- Despite having the world's third-largest production of peat (544 kilotonnes of oil equivalent [ktoe] or 2354 kt in 2018), and small amounts of crude oil (1 678 ktoe in 2018) and natural gas production (128 ktoe in 2018), Belarus depends heavily on imports to cover its energy demand.
- Nearly all electricity generation came from natural gas in 2018 (97%, or 39 terawatt hours [TWh]), but this is projected to change with the commissioning of two nuclear generators (1 200 megawatts [MW] each, to be operational in October 2020 and July 2021).
- Belarus is a large oil refiner (36th in the world, at 19 Mt of oil products in 2018).

Imports/exports

- Belarus depends heavily on imports for all types of fossil fuels, supplied mainly by Russia.
- The country is one of the world's largest importers of natural gas: according to preliminary data for 2018, it imported 17 Mtoe (20 billion cubic metres [bcm]) of natural gas, making it the leading importer among EU4Energy countries.
- Belarus imports similar quantities of crude oil (17 Mtoe in 2018), but most oil is re-exported in the form of oil products (11.4 Mtoe). Russia is the main supplier of crude oil refined in Belarus, and in turn Belarus is Ukraine's primary supplier of oil products.

Demand

- Total energy consumption (measured by total primary energy supply) in Belarus was 27.0 Mtoe in 2018, comparable with consumption in Norway and Hungary.
- The industry sector is the largest final energy consumer with a 36% share (7.3 Mtoe in 2018); it is also the greatest consumer of electricity and heat. The residential sector is Belarus's second-largest final energy-consuming sector (27% share or 5.2 Mtoe in 2018).
- Since 2000, the largest increase in energy demand has been in the transport sector (In 2018, consumption was 80% higher than in 2000). Transport is by far the largest consumer of oil products in the country.
- Primary energy intensity of Belarus is 0.15 tons of oil equivalent [toe] / 1000 USD (2015). This is above the world (0.111 toe / 1000 USD) and EU (0.076 toe / 1000

USD) averages. Out of the EU4Energy countries, energy demand is similar in Turkmenistan, whereas energy intensity in Belarus is 40% lower.

Renewables

- Renewables accounted for only 6% of Belarus's energy mix in 2018, mostly from biofuels and waste. Renewables share in electricity generation was even lower, 2% in 2018 (0.8 TWh).

Energy sector governance

Belarus's energy sector is dominated by state-owned companies operating under supervision of the [Ministry of Energy](#) in electricity, gas and part of the heat sector, and under [BelNefteKhim](#) (Belarus State Concern for Oil and Chemistry) in the oil, refining and petrochemicals sector.

Executive

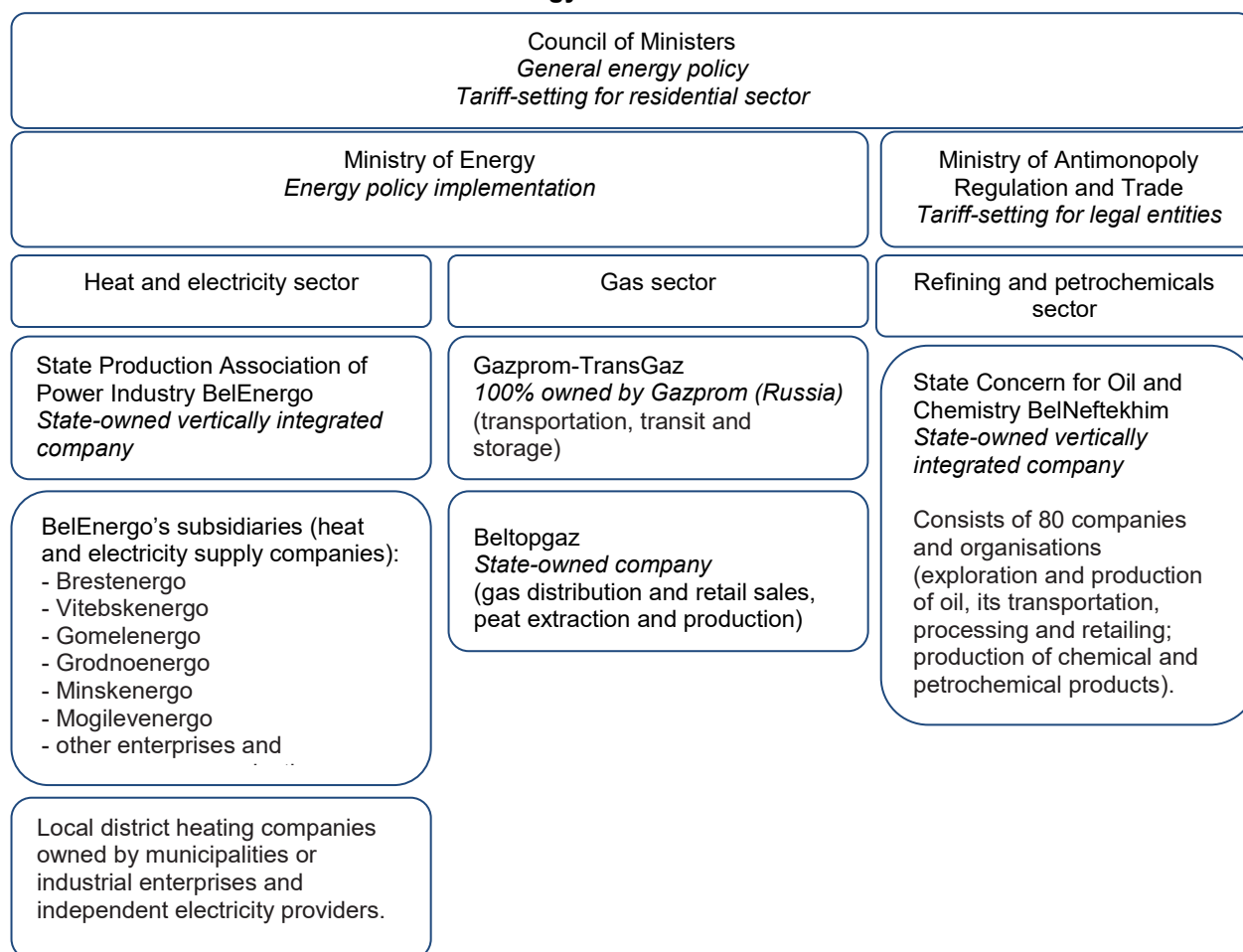
The **Ministry of Energy** is responsible for Belarus's fuel and energy sector. It manages the vertically integrated state-owned natural gas supplier BelTopGaz and the vertically integrated state-owned electricity producer, supplier and retailer BelEnergo. This ministry also oversees the state-owned Belarusian nuclear power plant (NPP) and other state-owned organisations operating in the energy sector, and it is responsible for implementing the Sectoral Programme of Electricity System Development for 2016-2020.

State regulation of the energy sector, including energy efficiency and renewable energy, is carried out through decrees, presidential directives, government decisions and the Ministry of Antimonopoly Regulation and Trade. Other relevant ministries and departments are also active participants.

The [Energy Efficiency Department of the State Standardisation Committee](#) is responsible for developing and implementing national energy efficiency and renewable energy policies. It also monitors and ensures state control of rational fuel, electricity and heat use.

Local councils, executive authorities and administrative bodies implement state energy policy, and there are many public and non-governmental organisations active in the field of energy efficiency, renewable energy and environmental protection in Belarus.

Belarus energy sector structure



Legislative

The highest legal document in Belarus is its Constitution. Under this are decisions, decrees and orders of the head of state, followed by constitutional laws and other legal acts, decrees of the [Council of Ministers](#) and other sectoral ministerial acts. In theory, this means that the head of state can override legislation that has been adopted by the parliament. This rule is a fundamental barrier to long-term investment, so making national legislation more predictable and stable for both domestic and foreign investors should be considered.

Judiciary

Under the Constitution, judicial power in Belarus belongs to the courts:

- The [Constitutional Court](#) adjudicates disputes concerning the compliance of regulatory legal acts with the Constitution. The Constitutional Court consists of 12 highly qualified experts: six judges appointed by the president and six elected by the Council of the Republic.

- The chairperson of the Constitutional Court is appointed by the [president](#) with the consent of the Council of the National Assembly. Judges of the Constitutional Court have 11-year terms.
- Courts of general jurisdiction (including special military courts) hear civil, criminal and administrative offence cases, as well as cases involving military personnel. Courts of general jurisdiction are the Supreme Court, regional courts, Minsk municipal court, municipal (district) courts and military courts.
- Economic courts adjudicate disputes between legal entities and some economic and business enterprises, including those involving foreign economic entities. The Supreme Economic Court, regional economic courts and the economic court of the city of Minsk make up this category.
- The [International Arbitration Court](#) of the Belarusian Chamber of Commerce and Industry is an alternative to the general and economic courts. It contributes to the implementation of foreign economic activities and ensures the confidential consideration of cases without excessive formalities.

Regulatory framework

The main pieces of legislation governing Belarus's energy sector are:

- the Law on Gas Supply (2003)
- the Law on Nuclear Energy (2008)
- the Law on Renewable Energy Sources (2010), which includes electricity and heat regulations
- the Law on Energy Savings (2015).

The Law on Energy Savings stipulates energy efficiency technology implementation and energy-efficient equipment requirements, but there is no law on electricity in Belarus, although the government is considering drafting a law that addresses electricity sector unbundling.

On 29 May 2019, a Protocol was signed amending the Treaty on the Eurasian Economic Union of 29 May 2014 (regarding the formation of a common EAEU electricity market). In the absence of a legal framework on power sector market relations, Belarus will have to finalise its draft Law on the Electric Power Industry so that Belarusian companies may participate in the EAEU's common energy market until 2025. Belarus must also ensure the development of rules for its wholesale and retail electricity markets, as well as other by-laws governing the economic, technical, informational and organisational relationships of participants in the wholesale and retail electricity markets.

There is also no law on heat, and no proposals are under consideration.

In May 2013 a [Power Supply Rule](#) was approved by the government, legislating electricity network development and rehabilitation, and in August 2014 a new [Decree on Grid Connection](#) was approved, allowing smaller private generators to access the grid.

On 11 September 2019, Resolution No. 609 of the Council of Ministers of the Republic of Belarus [on Issues in the Field of Heat Supply](#) approved the heat supply rules. The heat supply rules regulate consumer relations with energy-supply organisations, the procedure for connecting consumers' heat consumption systems to heating networks, and the payment procedure for heat energy. Because greater renewable energy use would reinforce energy security by reducing energy imports (at the same time as cutting GHG emissions), the government has made renewables development an energy sector priority.

In 2015 the Belarusian government amended the renewable energy regulations of the [Law on Renewable Energy Sources](#) adopted in 2010. In May 2015, it approved the [Presidential Decree on the Use of Renewable Energy](#) and in August 2015 a resolution on a new methodology for FITs. Approval of the [Comprehensive Development Plan for the Electricity Sector to 2025 and Beyond](#) happened in March 2016, and in April 2016 the [National Energy Saving Programme 2016-2020](#) was approved.

Under [Presidential Decree No. 357](#) of 24 September 2019, only renewable electricity generating companies that use new equipment are allowed to take part in tenders to allocate quotas for the implementation of renewable energy projects; all contracted renewable electricity is purchased at incentive tariffs for ten years. According to the Law on Renewable Energy Sources, renewable energy source (RES) procurement is carried out at the expense of the energy-supplying utilities (regional units of the vertically integrated operator, State Production Association [SPA] Belenergo). Renewable electricity generators must follow the dispatch control centre's schedule to maintain system reliability (i.e. halt the supply when there is an excess of electricity at night and restart it during the day).

Key policies

The aim of Belarus's energy policy is to secure reliable and sustainable energy while reducing energy import dependence and improving the energy sector's financial stability. Renewable energy and energy efficiency have been recognised as means to achieve these aims, but most of the change in the

energy sector will be effectuated by the new nuclear power station, expected to be partially operational by 2020.

Belarus's main energy policy document, the [Concept of Energy Security](#), came into force on 1 January 2016. Policy objectives have remained the same as in the previous policy document: increased use of local fuels and reduced gas import dependency; expanded trade and regional co-operation; stronger state control but legal protection for smaller private companies; new technology development; and reduced energy intensity of GDP. The main strategies to achieve these objectives are to:

- Reduce import dependency and develop domestic energy resources.
- Diversify import suppliers and increase energy transit.
- Reduce natural gas in the energy mix.
- Improve reliability through rehabilitation and modernisation, and increased oil reserves.
- Enhance demand-side energy efficiency measures and reduce GDP energy intensity.
- Enhance production and distribution energy efficiency.
- Make energy affordable while phasing out subsidies.
- Expand regional and global co-operation and trade/exports.
- Improve energy sector management.

The [Concept for Developing Power Generation Facilities and Power Grids to 2030](#) is a mechanism to implement the Concept of Energy Security. It prescribes that:

- The structure of generating equipment be optimised to maintain statutory power system reserves and comply with the required energy security indicators.
- Maintenance approaches for dilapidated and/or unclaimed boiler equipment be revised, especially for peak-load boilers, taking into account the input of electric boilers in large district heating systems.
- Power grid infrastructure be supported and developed, with the possibility of increasing electricity exports.
- District heating systems and heating networks be developed and modernised to minimise thermal power plant and boiler energy system operating equipment, while maintaining the supply of heat energy to consumers.
- Heat supply systems be equipped with complex automation, i.e. unified information systems that use smart grid technologies to automate the organisational and technological processes of district heating in cities.

- A legislative and regulatory framework be developed to govern the functioning of Belarus's energy system, incorporating documents adopted and planned for adoption by the EAEU and other international associations.

The Comprehensive Development Plan for the Electricity Sector provides for integration of the planned NPP and necessary changes in the regulatory and technical framework. The plan also includes allowances for network rehabilitation and development, and the phaseout of tariff subsidies. Its main technical goals are to:

- Commission the Belarusian NPP (2 400 MW).
- Reduce the share of gas in heat and electricity production to 60% by 2025.
- Integrate the NPP into the grid by installing 985 MW of electric boilers with Belenergo and 200 MW with other consumers.
- Construct 800 MW of peak-reserve power capacity.
- Restrict the Belarusian NPP's basic mode of operation in the non-heating period to 80% of rated power.
- Introduce electric heating and hot water systems in new building construction when technically and economically feasible.
- Expand electric vehicle charging infrastructure and electric public transport.

Energy statistics

The National Statistical Committee (Belstat) is responsible for compiling and publishing energy data in Belarus.

The main sources of data are annual, quarterly and monthly surveys on energy consumption and industrial production; trade and stock information are collected on a monthly basis. Energy statistics team of Belstat has a very good relationship with data providers and data users, particularly through its large national statistics working group.

Belarus's energy statistics collection methodology is based on:

- International Recommendations for Energy Statistics (UNSD, 2011)
- Energy Statistics Manual (IEA, 2005)
- Energy Efficiency Indicators: Fundamentals on Statistics (IEA, 2014)
- Energy Statistics: A Manual for Developing Countries (UN, 1991)
- Energy Statistics: Definitions, Units of Measure and Conversion Factors (UN, 1987)

- Concepts and Methods in Energy Statistics, With Special Reference to Energy Accounts and Balances (UN, 1982).

The *Energy Balance of the Republic of Belarus* is the main statistics publication and publicly available online in the energy section of the statistics website. A monthly bulletin is also produced and available on request. Belstat has shared the five International Energy Agency (IEA)/Eurostat/United Nations Economic Commission for Europe (UNECE) annual joint energy questionnaires since the early 1990s, and has aligned its energy balance with the International Recommendations for Energy Statistics. It also shares data with the CIS Statistical Committee and the EEC. In addition, Belarus participates in the Joint Organisations Data Initiative (JODI) for both oil and gas by sending these monthly data to the UN Statistics Division (UNSD).

The energy data produced by Belstat are widely used by government institutions. Reducing energy intensity is one of the targets of the country's key energy strategy document, the Concept of Energy Security, and the evolution of this indicator is monitored in every five-year plan. Energy data are also essential inputs for the short- and medium-term forecasts of the Ministry of Economy, the assessments of energy savings by the Department of Energy Efficiency, the inventories of carbon dioxide (CO₂) emissions done by the Ministry of Natural Resources, and the research of the National Academy of Sciences.

The National Statistical Committee has developed temperature-corrected time series of energy consumption, and it also co-operates closely with the Department of Energy Efficiency and other stakeholders to develop an expanded set of energy efficiency indicators to aid in energy efficiency planning. Energy end-use questions were included in the 2015 household survey.

Chapter 1. Energy security

Resource endowment

Oil deposits in Belarus are in a single oil and gas basin, Pripyat. There are several active oilfields and 59 more under development, the largest in the final stages.

Belarus has 27 Mt of crude oil reserves and 30 Mt of recoverable resources according to 2012 estimates of the Federal Institute for Geosciences and Natural Resources (BGR). Natural gas reserves are estimated at 3 bcm, and recoverable resources at 10 bcm.

According to the state programme on [environmental protection and sustainable use of natural resources](#) for 2016-20, oil will account for at least 80% of annual energy production in 2020.

Explored reserves of peat are estimated at 4 billion tonnes (Bt): 41 peat deposits cover a total area of 34 000 hectares (ha), and recoverable resources are estimated at 84.6 Mt. The 15 100 ha of mining resources hold 30.8 Mt. Peat production in Belarus was 0.551 Mtoe in 2018.

Belarus has identified brown coal reserves of 150 Mt, with further potential of 98.2 Mt. The most promising deposits for commercial development are in the western part of the Gomel Oblast, Zhitkovichi, Novoselovka and Tonezh.

Shale oil is a significant but undeveloped energy resource in Belarus: 8.8 Bt of shale oil are estimated, with up to 3.6 Bt of recoverable reserves, all concentrated within the Pripyat Shale Basin. About 30% of the Luban and Turovskoe fields have been explored, and probable resources are estimated at 1 223 Mt at Luban and 2 684 Mt in Turovskoe.

Energy security and diversification

Because energy security is one of Belarus's main objectives, its high dependence on Russian oil and natural gas imports makes energy efficiency and renewable energy development essential. The country's energy strategy is increasingly focused on reducing import dependency (particularly on natural gas

from a single supplier) by developing local energy sources, introducing nuclear power, decreasing overall consumption and reducing the amount of natural gas in the energy mix.

With energy independence and import supply diversification as strategic goals up to 2035, Belarus plans to reduce Russian supplies from 90% to 70% of total energy imports and, most strikingly, to reduce the share of gas in electricity and heat energy production from 90% to 50%.

The government is also monitoring 11 energy security indicators for policy development purposes. The indicators are technology-neutral and focus mostly on the general efficiency of the sector; seven of them are presented in the table below.

Indicator	2010	2015	2020	2025	2030	2035
Production as a share of TPES (%)	14	14	16	17	18	20
Renewables as a share of TPES (%)	5	5	6	7	8	9
Dominant import supplier (%)	96	90	85	80	75	70
Gas in TPES (%)	64	60	57	55	52	50
Installed electricity capacity to maximum actual load grid ration (%)	127	160	160	155	150	145
Share of gas in heat and electricity generation (%)	91	90	70	60	50	<50
Energy intensity of GDP, ktoe/BYR (2005 prices)	426	378	370	353	317	268

Source: Ministry of Energy, minenergo.gov.by.

It is also necessary to reduce gas demand and expand Belarus's underground gas storage capacity to improve energy security and accommodate seasonal fluctuations.

Chapter 2. Market design

National market structure

Electricity

Overall control and management of the electricity and heat sector falls under the Ministry of Energy, with BelEnergo owning and operating generation, transmission, distribution and retail sales of electricity and heat. Transmission system operator functions are distributed among BelEnergo and its subsidiaries: the central dispatch unit and six regional power system companies, or *oblenergots* that serve as distribution system operators. BelEnergo produces about 50% of the heat supply while the remainder is provided by local district heating companies owned by municipalities.

The Sectoral Programme of Electricity System Development for 2016-2020 involves restructuring the electricity sector and improving the electricity system's management and organisational structure by dividing the production cycle by activity (generation, transmission, distribution and sales) and creating relevant entities. It also aims to develop and adopt the legal acts necessary for regulation while addressing: 1) relations between the government and electricity sector organisations; 2) the degree of state involvement in managing and regulating electricity and thermal energy tariffs; and 3) the basic principles of wholesale and retail energy market formation and functioning. The development of these provisions is reflected in the [Concept for Developing Power Generation Facilities and Power Grids to 2030](#).

Oil

Belneftekhim is the key body responsible for the country's oil sector. It reports directly to the Council of Ministers and includes over 80 companies and organisations responsible for the full spectrum of activities across the oil value chain, including oil exploration and production, transportation, refining and marketing. It also produces a wide range of chemical and petrochemical products.

Gas

The natural gas sector essentially consists of two companies: Gazprom-TransGaz, which operates high-pressure transportation, transit and storage systems, and is responsible for new construction and maintenance; and BelTopGaz, which handles gas distribution and retail sales. Gazprom-TransGaz sells gas to BelTopGaz, which through its seven subsidiaries (regional distribution companies) resells the gas to end users in all sectors.

Gazprom-TransGaz is fully owned by Gazprom, and all matters related to natural gas transit, including infrastructure, system operations, tariff structure and technical services, are carried out under a bilateral agreement with Gazprom. BelTopGaz is fully state-owned.

Peat

The peat market is controlled by BelTopGaz, which controls production, distribution and retail marketing of peat and related products. BelTopgaz has seven subsidiaries (regional distribution companies) that supply peat to end users in all sectors.

Nuclear

Under the [Charter](#), the Ministry of Energy organises and co-ordinates the production of nuclear energy and the construction and operation of NPPs in Belarus.

In accordance with [Presidential Decree No. 583](#) of December 2013, the Republican Unitary Enterprise Belarusian Nuclear Power Plant performs the functions of holder and operating organisation for commissioning, operations, performance control, lifetime extension and decommissioning of the Belarusian NPP.

Renewable energy

The [Law on Renewable Energy Sources](#) established the legislative basis for FITs for renewables. Tariffs for electricity produced from RESs are based on the electricity tariff for industry (installed capacity up to 750 kilovolt-amperes [kVA]), multiplied by a special coefficient that is based on the type of renewable energy and lifespan of the installation (less than ten years versus more than ten).

Renewable energy producers also benefit from a guaranteed connection to the electricity grid. Even though the underlying legislation came into force in 2011, Belarus's production of renewable energy remained insignificant until 2014 when generation plants reached their planned capacity. In 2015, FITs for renewables were further differentiated by type of energy, capacity and installation lifespan ([Resolution No. 45](#)).

The procedure for setting, modernising and reconstructing existing units as well as determining and allocating quotas is determined by the [Presidential Decree on the Use of Renewable Energy Sources](#) (2019) and the [Resolution of the Council of Ministers on Setting and Allocating Quotas for the Construction of Renewable Energy Facilities](#) (2015). In consequence, a national interagency commission was established to determine and allocate quotas for renewable energy units. These quotas do not apply to units used by organisations and individuals to cover their own energy needs, or to investment contracts concluded and registered before the presidential decree came into force. In 2019 it was decreed that only new equipment may be used in renewable energy systems; that renewable energy generation of over 1 MW must be involved in the daily regulating schedule to cover the energy system's required electrical load; and that renewable energy system owners have the right to transfer electrical energy using the networks of energy-supply organisations.

The interagency commission established the 2020-22 quota for total renewables-based generation at 136.8 MW: 12 MW from biogas, 19.8 MW from wind, 62 MW from small hydro, 3 MW from biomass, and 40 MW from geothermal. It also approved a list of organisations and individual entrepreneurs entitled to establish renewable energy generation units within the allocated quotas.

Energy efficiency

Although the long-term value of energy efficiency has been recognised, the immediate financial investment is a major barrier. The cost of the [National Energy Saving Programme 2016-2020](#) was estimated at USD 5 billion, of which one-fifth was to be financed from the state budget. The remainder was envisaged to come from private financing, soft loans from international financial institutions, loans from the Development Bank of the Republic of Belarus, and other financial market instruments.

Upon agreement with the Ministry of Economy, the Department for Energy Efficiency annually develops and approves the main energy saving measures to be financed by the state budget. The criteria for selecting energy-efficiency

projects for state budget support were agreed by the Ministry of Economy and approved by the 14 October 2010 Decree No. 17 of the Department of Energy Efficiency. The 12 criteria take the main energy saving priorities into account.

There is no specific government fund dedicated to providing financial incentives to energy efficiency programmes, although the [Energy Efficiency Department](#) monitors the level of investment in energy efficiency.

The European Bank for Reconstruction and Development (EBRD) has a credit line of USD 50 million in Belarus for investing in energy efficiency and renewable energy projects in the private and public sectors. To take advantage of this credit line through the [Belarus Sustainable Energy Finance Facility](#), energy efficiency projects are selected according to financial viability and applicability within the technology criteria, and are given soft loans from the EBRD through local participating banks. However, most of the loans administered within the fund to date have been for renewables projects.

A number of international financial institutions (IFIs) such as the Nordic Environment Finance Corporation (NEFCO), the International Finance Corporation (IFC), and more recently the Eurasian Development Bank (EDB), have also provided energy-efficiency credit lines. These credit lines help local companies buy and install energy-efficient equipment, appliances and materials, as well as small-scale renewable technologies. Investments include modern production facilities, double-glazed windows, insulation, gas boilers, solar water heaters and rooftop solar panels. Technical assistance is often offered along with the credit lines to help companies design and appraise their projects.

The Belarusian partner banks determine the interest rates, loan terms, currency and other conditions within the product development framework, based on the needs of the company and the bank's risk management policy. The terms of financing are specified by the participating bank on an individual basis.

The maturity of most commercial loans is ≤ 5 years. The Development Bank of the Republic of Belarus (the DBRB) can finance long-term projects of major social and economic importance through direct lending or financing by leasing, or can act as an intermediary to attract borrowed funds from the financial market. Other Belarusian commercial banks can finance projects through the securities market.

Energy service companies (ESCOs) do not exist in Belarus, and awareness of the concept and its benefits is low. However, in December 2015 the government adopted the [Law on Public-Private Partnership](#) to encourage foreign investment,

aligned with international practices and in collaboration with the UN Economic Commission for Europe, the International Finance Corporation and the EBRD. Given the effectiveness of ESCOs in public-private partnerships, this law and supporting mechanisms for attracting foreign investment should raise the potential for ESCO market development in Belarus in the medium term.

The Presidential Decree on Increasing the Energy Efficiency of Multi-family Housing, which is currently at the public discussion stage, provides for the thermal modernisation of buildings to reduce residential sector heat consumption. It prescribes the creation of prerequisites and conditions to organise thermal modernisation of the housing stock, and the engagement of a wide range of financing sources. The sources of funding will be citizen funds (at least 50%); local budget funds coming from the privatisation of residential premises, which will contribute at least 10% of the annual total; local budgets for overhauling the housing stock, which will provide up to 10% of the set annual amount; and any other sources of funding not prohibited by law.

On 1 September 2013, the STB ISO 50001-2013 standard on energy management systems became valid in Belarus. Unlike energy audits, it is voluntary for organisations to implement an energy management system. According to data from the Register of the System of Certificates of Conformity for Management Systems, only five certificates of conformity have been issued (see the website of the State Committee for Standardization of the Republic of Belarus: <http://ps.belgiss.by>).

Regulatory framework

Belarus does not have a single independent energy regulatory authority. [The Ministry of Antimonopoly Regulation and Trade](#) is responsible for regulating electricity and heat tariffs for industrial customers, independent suppliers and all categories other than residential consumers, based on the 2011 Decree on Price Tariffs. Residential energy tariffs are regulated by the Council of Ministers, and regional executive committees and the Minsk City Executive Committee are responsible for regulating heat tariffs not already covered by the Council of Ministers.

With progressive reform in view, the government is planning to develop a body of legislation governing: 1) the ownership structure of the electricity and heat industry, 2) state involvement in setting electricity and heat tariffs, and 3) the

formation and functioning of the wholesale electricity market, including the laws on electricity and heat supply.

Belarus simplified its grid connection rules through the [Decree on Grid Connection](#) (August 2014) to allow for the connection of small private generators.

Regulatory functions in the gas sector are the responsibility of the president.

Tariffs

Electricity, heat and gas tariffs are calculated on a cost recovery basis, though the methodology is not disclosed to the public. Tariffs are adopted by resolution of the Council of Ministers and are subsidised for end users. There is no obligation to publish annual reports or information about various tariff structures, although end-use consumer tariffs are available.

Case-by-case FITs are available for specific categories of consumers, such as investors with large-scale industrial projects or industrial plants of strategic importance. Each case is considered separately and a relevant presidential decree is issued.

The price of imported gas is determined by contract between Gazprom and the Ministry of Energy. The state regulates the prices of LNG, gas and oil transmission and distribution, and petroleum products. After consultation with the relevant companies, the Ministry of Antimonopoly Regulation and Trade approves the tariffs in a special document that itemises the tariffs, costs and mark-ups.

Residential electricity tariffs are determined by consumption level and time of consumption (peak or off-peak periods), but other consumer categories have the choice of a single or differentiated tariff. Gas prices for final consumers depend on import prices and transport costs, and natural gas meters have been installed for all industrial and domestic consumers. Heat tariffs vary according to consumer category and area.

Regional markets and interconnections

Transit of electricity via the power grid is carried out within the framework of the Common Economic Space, which covers Belarus, Russia, Kazakhstan, Kyrgyzstan and Armenia and includes a pricing and tariff policy. Electricity transit

from CIS countries is governed by the Agreement on Electricity Transit within the CIS (2000). On 29 May 2019, a protocol was signed amending the Treaty on the Eurasian Economic Union of 29 May 2014 (regarding the formation of a common EAEU electricity market). The protocol defines the general principles for the formation, functioning and development of a common EAEU electricity market. Within this framework, co-operation is based on the equal rights of member states, balancing the economic interests of electricity producers and consumers and the priority use of market mechanisms, ensuring unhindered access to natural monopoly entities.

The strategic plans of the Baltic States' and Ukraine's energy systems to join the European Network of Transmission System Operators for Electricity (ENTSO-E) energy system have reduced the external connections – and thus the reliability – of Belarus's energy system. If Lithuania's electricity system and Ukraine's Unified Energy System stop parallel operations with Belarus's Unified Energy System, out of its 11 interstate overhead lines, only 4 with Russia's Unified Energy System will remain in operation. The [Concept for Developing Power Generation Facilities and Power Grids to 2030](#) therefore proposes options to improve Belarus's power system reliability.

Belarus transits gas from Russia to Ukraine, Poland, Lithuania and Russia's Kaliningrad region (through Lithuania). Gazprom-TransGaz operates the Yamal-Europe transmission pipeline that provides gas to Germany and is owned by Gazprom. However, Gazprom-TransGaz does not participate in preparing the Ten-Year Network Development Plans for Transmission Systems and Network Codes with the European Network of Transmission System Operators for Gas.

Oil transportation in Belarus is carried out through the Druzhba pipelines system: the Unecha-Polotsk, with a capacity of 29 Mt/year, the Unecha-Mozyr (80 Mt/year) and the Surgut-Polotsk (40 Mt/year).

Oil from the Unecha-Mozyr line is used for processing at Mozyr Refinery; the Mozyr-Brody pipeline transits oil to Ukraine, Hungary and Slovakia; and the Mozyr-Adamova Zastava line transports oil to Poland and Germany. The main oil pipelines, Surgut-Polotsk and Unecha-Polotsk, provide oil for refining at Naftan; the Polotsk-Birzai-Mazeikiai line transits oil to Lithuania, and Latvia receives oil via the Polotsk-Ventspils main oil pipeline. Total refining capacity of the two Belarusian refineries (Mozyr and Novopolotsk) is 22 Mt/year.

Chapter 3. Sustainable development

Renewable energy

The Law on Renewable Energy Sources regulates relations among all entities involved in the use of RESs for electricity production and consumption, as well as production of renewables for use by renewable energy plants. The creation of new facilities, and modernisation and reconstruction of existing facilities for renewable energy activities, is defined by the Decree on the Use of Renewable Sources of Energy and the Resolution on Setting and Allocating Quotas for the Construction of Renewable Energy Facilities.

Tariffs for electricity produced from RESs by individual entrepreneurs and legal entities not part of Belenergo were established under the [Resolution on Tariffs for Electricity Produced from Renewable Energy Sources](#) (2018).

The main emphasis in Belarus is on increasing the use of wood fuel, as it requires less capital investment than other types of renewable energy. Fuel from woody biomass (i.e. rough wood, pellets, chips and briquettes) is produced locally using modern harvesting and wood-chipping equipment.

In overall renewable energy capacity, as of December 2018 Belarus had:

- More than 3 200 installations using local energy resources, with total electrical capacity of 130 MW and thermal capacity of over 6 000 MW, including 22 mini co-generation plants¹ generating 130 MW of electricity and 345 megawatts thermal (MW_{th}) of heat.
- 21 biogas plants with total electrical capacity of 34.3 MW.
- 2651 small hydroelectric power stations with total installed electrical capacity of 7.018 MW.
- 50 wind power plants with total installed electrical capacity of 102.7 MW.
- 118 heat pumps, with total heat capacity of 10 MW_{th}.
- 63 solar PV plants with total electrical capacity of 154.3 MW.
- 287 solar heating installations with total heat capacity of 3.9 MW_{th}.

¹ Co-generation refers to the combined production of heat and power.

Small hydro

Hydropower resources in Belarus are deemed scarce, though there are opportunities for small hydro in the northern and central parts of the country. Total hydropower potential is estimated at 850 MW, including technically available potential of 520 MW and economically viable potential of 250 MW (0.44 Mtoe/year).

Solar

Solar power potential is significant, mainly in the south and southeast of the country. In terms of global horizontal irradiation (GHI) and direct normal irradiation (DNI), most of Belarus receives only 1 100 kilowatt hours per square metre (kWh/m²) to 1 400 kWh/m² of GHI, and around 1 000 kWh/m² of DNI. This means that concentrated solar power (CSP) generation is impractical, but production by means of solar PV is possible. Solar energy could also be used in solar water heaters and other systems for water heating and drying in agriculture, water and space heating in buildings, and low-temperature process heat in industry and services. Total solar potential is therefore estimated at 49.7 Mtoe/year.

Wind

Wind energy potential is estimated at up to 1 600 MW (0.47 Mtoe/year based on average wind speeds and plants with 2.5 MW capacity at an altitude of 100 metres), with 1 840 wind farms possible in three regions: Hrodna, Minsk and Mogilev. This is not a high-quality resource, but still acceptable in certain places owing to the recent development of low-wind-speed turbines. These estimates seem conservative, however, as modern wind technology has increased the scale of turbines (now with an average size of over 2 MW per turbine) and raised the energy yield, particularly at lower wind speeds. It is therefore recommended that estimates of wind potential be updated to take these developments and modern best practices in spacing and siting of turbines into account.

Geothermal

Belarus's geothermal potential is relatively undiscovered, with only a few regions having been tested. Of the tested regions, the most promising geothermal energy potential lies in the Pripyat Trough (Gomel region) and the Podlasie-Brest Depression (Brest region), in dozens of abandoned deep wells. Other areas

studied include the shallow sedimentary horizons in the western part of the country, while potential for low-enthalpy geothermal energy is believed to exist over the entire territory.

Biomass

Belarus's potential for producing bioenergy from wood residues is significant, as forests cover about 40% of the country's territory (9.5 million ha), 50% of which is mature solid biomass (wood). Solid biomass resources from waste wood suitable for producing bioenergy include firewood, timber, wood residue and fast-growing grey alder. Solid biomass resources are estimated at 1.5 bcm with annual growth of about 30.3 million cubic metres (mcm). Fast-growing plantations of grey alder account for around 18 mcm, with 1 mcm used as firewood. Solid biomass from waste wood is consumed in 7 heat plants and 3 000 boilers; production capacity of wood and waste wood fuels is estimated at 11.7 mcm annually (2.2 Mtoe), with around 10 mcm utilised at present. According to the National Programme on Local and Renewable Energy Development for 2011-2015, energy potential from wood and wood processing waste is approximately 2.2 Mtoe/year; from crop waste 1 Mtoe/year; and from straw 0.7 Mtoe/year.

Waste

Biogas potential is also considerable owing to the many professionally operated large-scale animal farms (cattle, pig and poultry) as well as significant waste from households, crops and sewage treatment plants, and municipal and food industry waste.

With 7.7 Mt of manure output per year, around 3.5 bcm (2.3 Mtoe) of biogas could be generated. Preliminary government studies of potential energy from wastewater treatment plants indicate that around 9.2 MW of heat is possible from sites across the country, and solid municipal waste energy potential is estimated at 0.3 Mtoe/year.

Potential for biofuel production (ethanol and biodiesel) is high because of the country's large agricultural land area and activity, with most opportunities coming from sugar production, starch and the cellulose industry.

Energy efficiency

The National Energy Saving Programme 2011-2015 (Resolution No. 1882) set ambitious targets of reducing energy intensity of GDP by 29-32% by 2015 compared with 2010 and increasing the share of local energy resources in the fuel balance to 28% by 2015. Growth in both real GDP and energy demand was assumed, and a wide range of measures was envisioned to achieve these objectives. Energy intensity in 2012 was 0.21 toe per USD 1 000 GDP PPP, which was 39% lower than in 2002, or the fifth lowest among Eastern Europe, Caucasus and Central Asia (EECCA) countries.

The 2014 Law on Energy Savings stipulates energy efficiency technology implementation and equipment requirements, and total required funding was estimated at USD 8.6 billion: 38% from enterprises, 27% from the national budget and 15% from local budgets; loans and other resources were planned to finance the remaining 20%. However, as reported by the Department of Energy Efficiency, national and regional budgets provided only USD 1 439 million – 40% less than what was initially planned – and the Programme's energy efficiency targets for 2011-15 have not been achieved.

According to the National Energy Saving Programme 2016-2020 (Resolution No. 248), in 2011-14 the energy intensity of Belarus's GDP dropped by 8.3% (GDP grew by 9.8%, but energy consumption remained practically unchanged). Although 8.3% is a considerable decrease, it is more than three times short of the target set in 2011.

Energy intensity of GDP under the National Energy Saving Programme 2016-2020 is to be reduced by at least 2% by 2021 compared with 2015. Domestically sourced primary energy in total energy consumption is planned to reach at least 16% – mainly owing to inauguration of the NPP, although 6% is to come from renewable sources. Funding for these energy saving measures, based on Belarus's social and economic development parameters, has been set at BYN 11 064.2 million (USD 5 625 million).

In 2016, the energy intensity of GDP rose 1.2% even though the target was a 0.4% drop, while in 2017 it climbed 0.5%, missing the targeted 0.5% decrease, and in 2018 it increased 1.5%, again exceeding the +1% target. Rising consumption of fuel and energy resources not regulated by the state standard (i.e. gasoline and diesel fuel by the general population, in addition to other fuels and raw materials) led to higher gross consumption of fuel and energy resources, preventing GDP energy intensity reduction targets from being met.

At the end of 2018, local energy resources made up 15.5% of gross energy consumption and RESs accounted for 6.1 %.

As international technical norms and standards are essential for improving energy efficiency, 250 technical regulations were developed from 2007 to 2015 (more than 90% harmonised with international and European requirements) and 138 during 2016-20 under the Programme for Developing the System for Technical Regulation, Standardisation and Conformity Attestation in the Field of Energy Saving. The Energy Efficiency Department of the State Standardisation Committee has seven regional offices and is responsible for implementing and monitoring policies on energy savings, energy efficiency and renewable energy. It develops proposals for energy efficiency improvements and for technical regulations and standardisation of energy equipment, provides state supervision of efficient energy use, and develops legal and financial measures to stimulate energy efficiency.

Public awareness of energy efficiency in Belarus is relatively high, as information is regularly shared through media campaigns, information sessions, publications, educational seminars and other avenues of information dissemination.

Environmental protection

The national environmental policy provides for gradual restructuring of energy production and a higher technological level of production, resource conservation, use of low-waste and non-waste technologies, reduced emissions and discharges of pollutants into the environment, recycling and processing of waste, and elimination of the negative effects of economic activity. Environmental improvements are to be achieved with new technologies, construction, modernisation of existing infrastructure and industries, and environmental standards and regulations.

Climate change

Belarus is an Annex I Party to the Kyoto Protocol of the UN Framework Convention on Climate Change (UNFCCC). Its first target was to reduce GHG emissions by 8% from the 1990 level in the 2008-12 commitment period, and the government then decreed a 12% reduction for the second period (2013-20). The target for the second period was changed to an 8% reduction at the Doha Conference of the Parties (COP) in December 2012, but this change has not yet come into effect.

Main policies and measures fall under the State Programme of Measures to Mitigate the Effects of Climate Change for 2013-20: it targets an 8% reduction in GHG emissions by 2020 compared with 1990 (about 10 million tonnes of carbon dioxide-equivalent [MtCO₂-eq]). The measures to achieve this include energy efficiency improvements, enlargement of forested areas, restoration of peatlands and improvements to the regulatory and legal framework related to climate change, at an estimated cost of EUR 8.3 million. Policy decisions on climate change were prepared in close co-operation with international bodies.

GHG emissions in Belarus were 89.2 MtCO₂-eq in 2012 – 35.8% lower than in 1990 (not including land use, land use change and forestry [LULUCF]). Owing to its large forested area, emissions including LULUCF were 63.7 MtCO₂-eq in 2012. GHG emissions in Belarus have been rising since the mid-1990s with economic growth and increased demand for energy, but even if emissions continue to increase it can still reach its 2013-20 Kyoto target.

Energy-related emissions of CO₂ totalled 58.3 Mt in 2013, approximately 80% of total GHG emissions. Dominated by power generation (50.1%) and transport (21.4%), emissions in 2013 were 13.4% higher than in 2003 but 41.6% lower than in 1990.

Belarus submitted its Intended Nationally Determined Contribution (INDC) to COP21 in 2015, with a pledge to reduce emissions by at least 28% by 2030 compared with 1990. It officially adopted the Paris Agreement in September 2016.

Technology research, development and deployment

The Academy of Sciences organises and co-ordinates fundamental and applied research in the natural sciences, engineering, social sciences, and the humanities and arts in line with the country's goals and policies. It also monitors the energy security indicators and develops strategies for maintaining them, and it is responsible for scientific and technical research in implementing projects related to renewable and alternative energy.

All technologies currently deployed in Belarus are mature and have commercial status. The technology with the most mature local market is biomass, currently used mainly in heat generation. Belarus is still in the early stages of deploying

wind, solar PV and biogas, although the technologies used in their development are considered mature and meet international standards.

Belarus does not conduct significant research and development (R&D) in renewable technologies, instead focusing mostly on energy savings and efficiency. Under the latest Scientific and Technical Programme for Power Engineering and Energy Efficiency for 2016-2020, R&D priorities in renewables include resource assessments and the use of industrial biogas and municipal waste, although without significant funding. Another area of development is the production of competitive equipment and instruments that increase energy efficiency and system reliability.

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