Markets served

Macroeconomic overview

In 2019, the global economy continued to slow down, growing at a mere 2.4%, the lowest rate in the last decade[1]. An escalating trade war between the USA and China, the two world's economic superpowers, pushed the growth back to the levels seen in 2015–2016, with an increased global uncertainty hitting the investment activity and demand for durables.

The deteriorating economic outlook has prompted central banks to put on hold monetary tightening, which led to the relaxation of financial conditions globally. At the same time, many emerging markets saw positive effects from resumed capital inflows offset by weaker external demand.

According to the Rosstat data for 2019, Russia's real GDP grew by 1.3%[2]. In the previous year, the GDP expanded by 2.5%.

Across industries, the non-primary sector saw the biggest y-o-y decline as regards its positive contribution to GDP, while the production input remained flat as a result of stable growth.

1.3%

was the growth of Russia's real GDP

Global GDP, %

GDP	2016	2017	2018	2019
World	**2.6**	**3.2**	**3.0**	**2.4**
Advanced economies	**1.7**	**2.4**	**2.2**	**1.6**
USA	1.6	2.4	2.9	2.3
Europe	1.9	2.5	1.9	1.1
Japan	0.6	1.9	0.8	1.1
Emerging markets and developing economies	**4.2**	**4.5**	**4.3**	**3.5**

Electricity market outlook for key global markets

According to the International Energy Agency, energy consumption worldwide will keep growing at 1.3% per annum in line with current trends. At the same time, there is a shift towards renewables, albeit too slow to match the expansion of the global economy and population.

[1] The World Bank's Global Economic Prospects report, January 2020.

[2] Statistical datamart at https://showdata.gks.ru/report/280029/

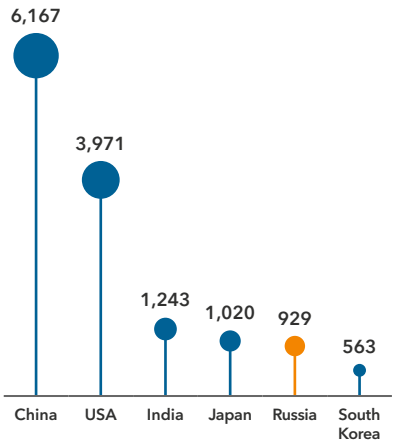
Global energy consumption: 2040 outlook[1] ('000 TWh)

Territory	2015	2020	2025	2030	2035	2040
Asia Pacific	8.8	10.6	12.4	14.5	16.8	19.0
North America	4.3	4.3	4.4	4.4	4.5	4.7
Europe	3.2	3.4	3.6	3.8	4.0	4.2
Latin America	1.3	1.4	1.5	1.7	2.0	2.2
CIS	1.0	1.1	1.2	1.3	1.5	1.7
Middle East	0.9	1.0	1.1	1.2	1.4	1.7
Africa	0.6	0.7	0.8	1.1	1.3	1.5
Total	**20.1**	**22.5**	**25.0**	**28.0**	**31.5**	**35.0**

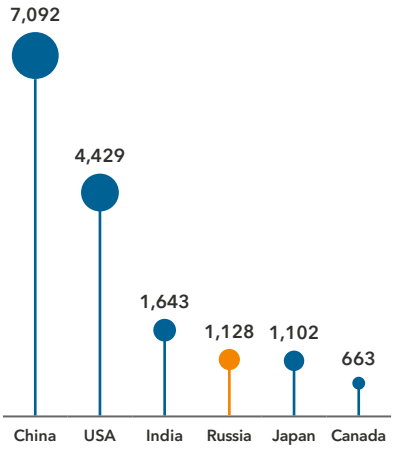
Power generation for the period until 2040 will increase by 70%, with over 85% of this growth coming from non-OECD countries. Fossil fuel will be used to generate less than 50% of the global power supplies. Global electricity capacities will almost double towards 2040.

Russia's position in the global electrical energy system

Power consumption leaders, TWh



Power generation leaders, TWh



At the end of 2019, Russia was the

4th-largest

electricity producer and

5th-largest

electricity consumer in the world

[1] EnerOutlook 2019.

Russian electricity and capacity market

The Russian electricity and capacity market is comprised of the wholesale electricity and capacity market (WECM) and the retail electricity market (REM).

The wholesale market is a place where a special type of commodities – electricity and capacity – are traded within the Unified Energy System across Russia's economic space. Capacity as a commodity is an obligation to properly maintain power generating facilities in order to timely meet the consumer demand for electric power. The retail market trades in only one commodity – electric power.

Under the law, all electricity and capacity facilities with an installed capacity of over 25 MW located in the price and non-price zones are required to sell their products in the WECM only. Power plants with a capacity below 5 MW are required to trade in the REM only, while power plants with a capacity between 5 MW and 25 MW can trade in both the WECM and REM.

From 2011, system services are a major instrument for maintaining reliability and high quality of the Unified Energy System of Russia in the fully liberalized electricity and capacity markets.

Regulatory framework:
- Federal Law No. 35-FZ On Electric Power Industry dated March 26, 2003;
- the Russian Government's Resolution No. 1172 On Approval of Rules for the Wholesale Electricity and Capacity Market and on Amendments to Certain Acts of the Government of the Russian Federation Concerning Organization of the Wholesale Electricity and Capacity Market dated December 27, 2010;
- the Russian Government's Resolution No. 442 On the Operation of Retail Electricity Markets, Full and/or Partial Limitation of Electricity Consumption dated May 4, 2012;
- an agreement for accession to the wholesale market trading system, and WECM regulations.

Wholesale electricity and capacity market in the first and second price zones

The WECM participants include generating companies, electric power exporters/importers, electricity retailers, electric grid companies (electricity purchases to cover transmission losses), and large consumers. The wholesale electricity and capacity market covers both price and non-price zones. The first price zone comprises the European part of Russia and Urals, while the second price zone encompasses Siberia.

The WECM has several sectors that offer different transaction terms and delivery times:
- regulated contracts (RC);
- the day-ahead market (DAM);
- the balancing market (BM);
- capacity auctions (KOM);
- capacity supply agreements (DPM);
- capacity sale contracts for must-run generating facilities;
- unregulated bilateral contracts, as well as unregulated electricity and/or capacity sales contracts (FBC, FECC, FCC).

The Market Council Non-Profit Partnership established under Federal Law No. 35-FZ On Power Industry dated March 26, 2003 is responsible for running the wholesale market's commercial infrastructure.

Trading System Administrator of the Wholesale Electricity and Capacity Market (JSC TSA) is responsible for administering electricity and capacity transactions in the wholesale market (the trading system of the wholesale market).

Financial settlements between the WECM participants are handled through the Center for Financial Settlements (CFS).

The WECM technological infrastructure is administered by the System Operator of the Unified Energy System which exercises exclusive and centralized operational management of Russia's Unified Energy System and monitors compliance with the system's technological parameters. The market's technological

infrastructure is also supported by the Federal Grid Company (FGC UES), which manages the Unified National Electric Grid (UNEG), and interregional distribution grid companies (IDGC).

The activities of infrastructure operators, including their pricing policies and counterparty relations, are subject to government regulation and control.

Retail electricity markets

Companies operating within the designated price zones of the retail electricity market are guided by the retail market pricing rules based on the WECM tariffs. They also take into account approved tariffs for services subject to government regulation.

Electricity sold in the retail market is either purchased in the WECM or sourced from generating companies that do not operate in the wholesale market. In the Russian regions included in non-price zones of the wholesale market, the retail electricity price for end consumers is set based on the wholesale market prices. Prices aligned with the wholesale market apply to all end consumers, with the exception of households and equivalent consumer categories.

Households and equivalent consumer categories are supplied with power at regulated prices (tariffs) approved by the regional executive authorities in charge of tariff regulation.

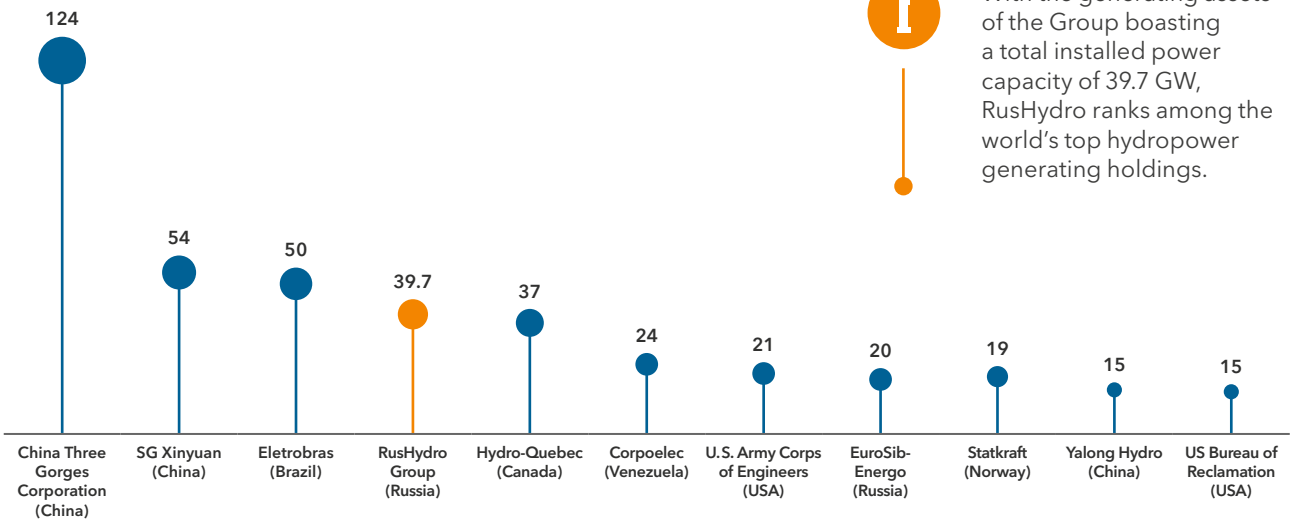
System services market

The types of services to ensure system reliability, the procedure to select power suppliers and consumers in charge of such services, applicable service provision rules and pricing mechanisms are all set out in the Russian Government's Resolution No. 117 *On Selecting Electric Power Suppliers and Consumers to Provide System Reliability Services, Rendering Such Services, and Approving Amendments to Acts of the Government of the Russian Federation Concerning the Provision of System Reliability Services* dated March 3, 2010.

Generating companies and major electricity consumers render system reliability services under the supervision of the System Operator.

RusHydro's position in the industry *[102-6] [OS]*

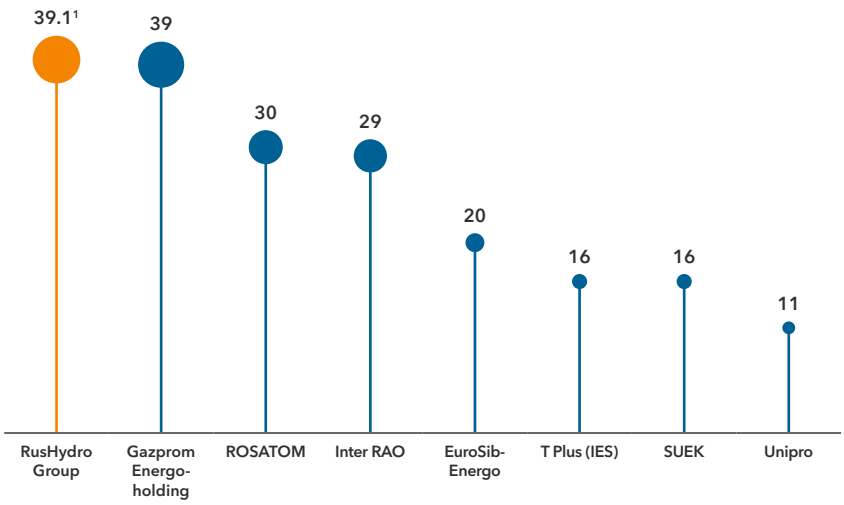
The world's largest hydro-generating companies[1], GW



With the generating assets of the Group boasting a total installed power capacity of 39.7 GW, RusHydro ranks among the world's top hydropower generating holdings.

[1] Hydropower generation has the biggest share in the installed capacity of the listed companies. The chart shows total installed capacity data for all types of generation.

Russia's top generating companies by installed capacity, GW



RusHydro Group is one of Russia's leading electric power producers, with independent energy companies acting as its main competitors.

The Group sells electricity in Russia both in the wholesale electricity and capacity market (first and second price zones and UES East's non-price zone) to major consumers and to retail consumers via its retail companies and guaranteed suppliers.

The Company also provides reactive power capacity adjustment services to the System Operator without generating electricity.

Based on the plans of the Russian Ministry of Energy, the Scheme and Program to Develop the Unified Energy System of Russia in 2019–2025[2], and analysis of RusHydro's Investment Program and Business Plan, we expect that:

- RusHydro Group's generation share will decline from 13.0% in 2019 to ca. 12.8% in 2020, with the Group's output expected to drop due to the anticipated fall in water levels;
- the share of RusHydro Group's power generating facilities in Russia's total installed capacity will remain flat at 15.5%.

The key developments affecting the Group's markets in 2019 included:

- the enactment of the Russian Government's Resolution No. 43 On Selecting Projects to Upgrade the Generating Facilities of Thermal Power Plants dated January 25, 2019. Following the upgrade, the selected facilities will generate power at a special (higher) capacity price to compensate for upgrade costs. RusHydro Group's projects were included in the list;
- the inclusion of Central and Western energy hubs of Yakutia in the non-price zone of the Far Eastern WECM effective from January 1, 2019.

The Group's key competitive advantages include high profitability, flexibility of hydropower generating facilities, eco-friendliness and economic efficiency of production processes.

RusHydro's share in Russia's electric power market[3], %

Year	Electricity output, mn kWh		Share, %	Installed capacity, MW		Share, %
	Russia	RusHydro Group		Russia	RusHydro Group	
2017	1,073,700	139,820	13.0	246,868	38,479	15.6
2018	1,091,700	143,853	13.2	250,400	38,803	15.5
2019	**1,096,200**	**142,414**	**13.0**	**251,958**	**39,122**	**15.6**

[1] Excluding the installed capacity of Armenia-based electricity generating facilities (CJSC MEK).

[2] Approved by Order of the Russian Ministry of Energy No. 174 dated February 28, 2019.

[3] Excluding CJSC MEK.

RusHydro Group SWOT analysis *[102-15]*

Strengths	Weaknesses
● strong capitalization upside; ● large scale of operations, which enhances the Company's appeal in the capital markets; ● power generation not requiring fuel and therefore not susceptible to fluctuations in fossil fuel prices (HPP/PSPP-based); ● long lifespan of hydropower facilities; ● flexibility of hydropower generation, with HPPs and PSPPs viewed as key providers of system services; ● use of HPPs for river runoff control, flood risk mitigation, fresh water accumulation and other water management purposes.	● fundamental dependence on natural conditions; ● physical and moral wear and tear of production assets, especially in the Far Eastern Federal District; ● a long investment cycle and high capital intensity of CAPEX projects; ● economically inefficient infrastructure expenditures and projects; ● high leverage of JSC RAO ES East; ● fundamentally undervalued shares.
Opportunities	**Threats**
● creating a market model to support the operation of the existing hydropower facilities and new growth projects; ● significant untapped hydropower resources and HPP-focused development; ● stronger government role in ensuring energy security; ● the emergence and use of advanced equipment and technologies to achieve operational excellence; ● creating a RES-favourable regulatory environment; ● boosting the Company's investment appeal and potentially attracting a strategic investor(s).	● higher interest rates on long-term borrowings; ● reduced government capacity to finance infrastructure projects; ● shift to a market model which disregards the HPP and PSPP contribution to the UES reliability; ● change in the government's regulatory activity to support energy generation from renewable sources; ● slow growth of demand from the current and new industrial consumers in Siberia and the Russian Far East; ● slow increase in unregulated prices in the wholesale electricity market; ● suppliers and contractors lacking resources to implement large-scale industry development programs, an accelerated increase in equipment and materials prices; ● risk of industrial disasters.

RusHydro Group PEST analysis

Political and regulatory factors	Economic factors
● changes in the electricity and capacity pricing mechanisms in the liberalized segment; ● changes in the support framework (DPM, RES-based DPM, surcharges); ● new tariff system; ● launch of the EAEU common electric power market.	● electricity and heat consumption growth; ● water inflow in the reservoir; ● change in water taxes; ● fuel prices; ● change in the key interest rate; ● investment activity.
Social and cultural factors	**Technological factors**
● effective demand from the current and prospective consumers; ● payment discipline.	● technological emergencies; ● delayed commissioning of new energy facilities; ● irregular fuel supplies.

Electricity markets in the Far Eastern Federal District

The Far Eastern Federal District is one of Russia's largest regions covering 6,215.9 thousand km^2 or 36.4% of Russia's total area. RusHydro Group is the region's main electricity supplier[1].

Energy tariffs in the non-price and isolated zones of the Far Eastern Federal District are set by the federal government authorities in charge of tariff regulation (regulators) in line with the applicable pricing policies and rules for the government regulation of electricity and heat tariffs in Russia. There are no unregulated tariff zones in the Far Eastern Federal District due to systemic restrictions.

In the WECM's non-price zone, a single purchaser model has been put in place, with suppliers selling electricity and capacity to a single purchaser at set rates. Wholesale customers buy electricity and capacity from the single purchaser at prices calculated by JSC TSA.

Far Eastern Energy Company (DEK) has been designated as the single purchaser in the Far East. Accounting for over 50% of retail electricity supplies in the Far East, DEK is an electricity retailer created through restructuring of regional energy and electrification companies.[2] The company is the guaranteed supplier in the Amur Region, Jewish Autonomous Region, and Khabarovsk and Primorsky Krai. DEK's retail supplies account for over 85% of the UES East electricity consumption.

Retail electricity prices factor in the following regulated components: wholesale prices (if applicable), tariffs from the generating facilities that serve the retail market, grid transmission tariffs and the sales surcharge.

In some areas of the Far East, including the isolated energy systems of the Kamchatka Territory, Magadan Region, Chukotka Autonomous Area and the Sakhalin Region, the retail market is the only available option as these areas are not linked to the Unified Energy System of the East.

To bring electricity tariffs in the Far East in line with the Russian base (average) rate, a surcharge was added to the capacity price in the first and second price zones of the WECM. RusHydro has been designated by the Russian Government to collect and transfer the surcharge amount to the Far East governments (Magadan and Sakhalin regions, the Kamchatka Territory, the Republic of Sakha (Yakutia) and the Chukotka Autonomous Area). This measure has helped reduce the accounts receivable from current consumers in the Far Eastern Federal District and attract investments in the macroregion's energy-intensive industrial projects to help create potential effective demand for electricity.

Macroregion's social and economic development

According to Russia's social and economic development outlook to 2024, the Amur Region and the Chukotka Autonomous Area will be the fastest-growing areas in the Far East, with the biggest increase in the gross regional product (GRP), industrial output and investment activity. The Sakhalin Region will see the weakest GRP growth due to reduced oil and gas production.

GRP GAGR in 2020–2024

Region	Ranking	CAGR, %
Chukotka Autonomous Area	1	108.8
Irkutsk Region	2	108.7
Amur Region	3	106.1
Magadan Region	4	105.4
Moscow Region	5	104.9
Ulyanovsk Region	6	104.8
Republic of Sakha (Yakutia), Yamal-Nenets Autonomous Area	7	104.5
Yaroslavl Region	8	104.2
Republic of Adygeya, Sverdlovsk Region	9	104.1
Novosibirsk Region	10	104.0

[1] Excluding the Trans-Baikal Territory and the Republic of Buryatia.

[2] In accordance with paragraph 170 of the Russian Government's Resolution No. 1172 of December 27, 2010.