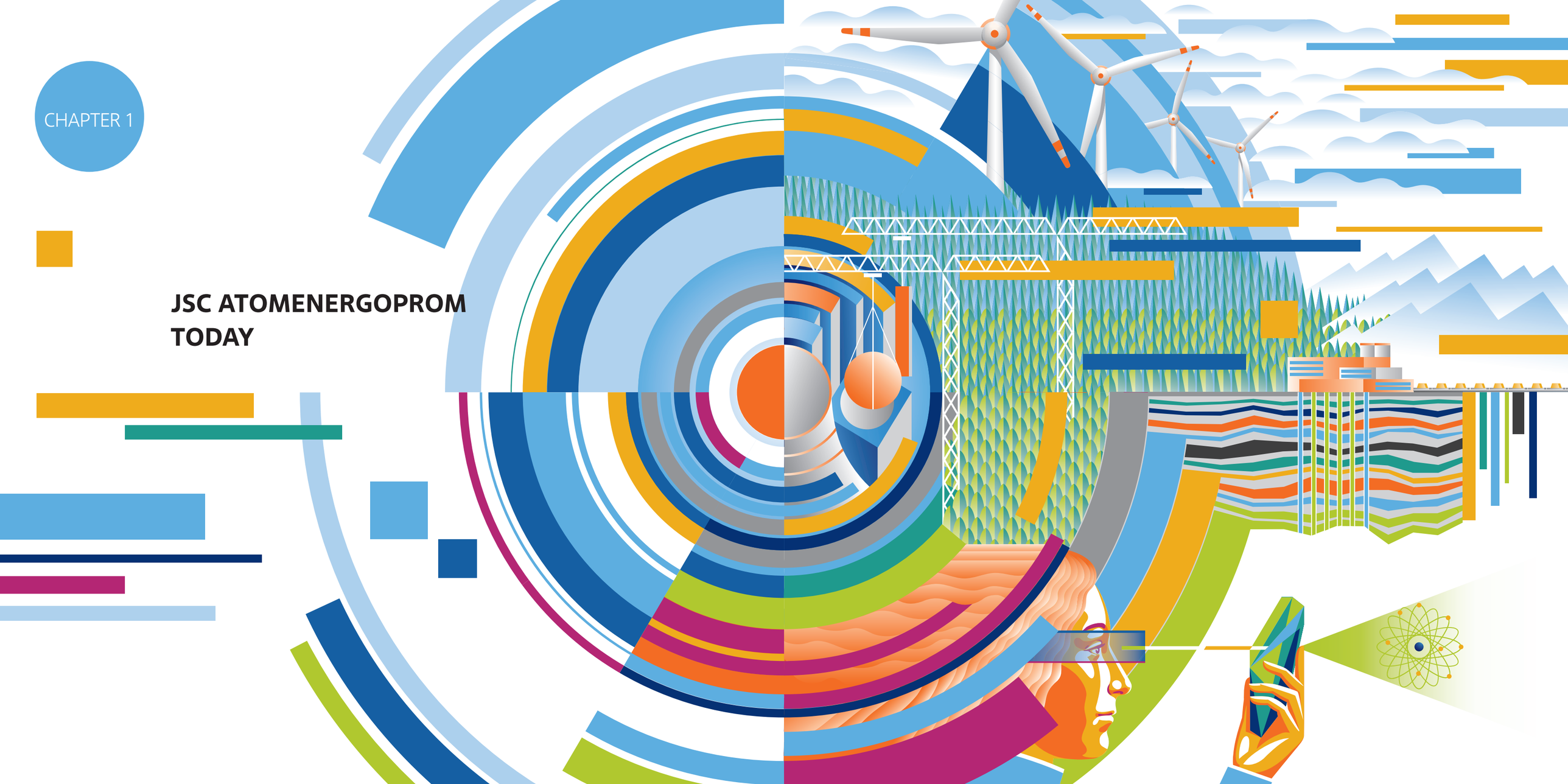
ROSATOM

JOINT-STOCK COMPANY ATOMENERGOPROM ANNUAL REPORT 2020

Table of Contents

CHAPTER 1

JSC ATOMENERGOPROM TODAY



Company Profile

GRI 102-1
GRI 102-5

Primary state registration number (OGRN): 1077758081664.
State registration date: 19 July 2007.
State registration authority: Inter-District Inspectorate No. 46 of the Federal Tax Service in Moscow.

GRI 102-3

Location: 24 Bolshaya Ordynka Street, Moscow.
Tel.: +7 (495) 969-29-39.
Fax: +7 (495) 969-29-36.
Official website: www.atomenergoprom.ru

1. Shareholders of JSC Atomenergoprom

Holders of record of JSC Atomenergoprom as at 31 December 2020:

1. State Atomic Energy Corporation Rosatom.
Location: 24 Bolshaya Ordynka Street, Moscow, 119017.
Status of the holder of record: shareholder.
Interest in the Company's authorised share capital: 94.46%.
Portion of voting shares held by the entity: 100%.

GRI 201-4

2. Russian Federation represented by the Russian Ministry of Finance.
Location: 9 Ilyinka Street, Moscow, 109097.
Status of the holder of record: shareholder.
Interest in the Company's authorised share capital: 5.54%.
Portion of voting shares held by the entity: 0%.

2. Auditor of JSC Atomenergoprom

Full name: LLC Financial and Accounting Consultants (LLC FBK).
Location: 44/1 Myasnitskaya Street, Moscow, 101990.
INN: 7701017140
OGRN: 1027700058286
Tel.: +7 (495) 737-53-53
Fax: +7 (495) 737-53-47
Email: fbk@fbk.ru
JSC KPMG is the auditor for the summary consolidated IFRS financial statements for 2020.

3. Registrar of JSC Atomenergoprom's shares

The shareholder register of JSC Atomenergoprom is kept by **Joint-Stock Company Independent Registrar Company R.O.S.T.**:
Abbreviated company name: *JSC IRC – R.O.S.T.*
Location: office IX, 18, Bldg. 5B, Stromynka Street, Moscow, 107996.
INN: 7705038503.
OGRN: 1027739216757.
Licence: 045-13976-000001.
Issue date: ***3 December 2002***.
Expiry date: ***perpetual licence***.
Licensing authority: ***Russian Federal Commission for the Securities Market (Federal Financial Markets Service)***.
Date from which the registrar has kept the issuer's shareholder register: 28 October 2009.
JSC Independent Registrar Company R.O.S.T. also maintains shareholder registers of the majority of JSC Atomenergoprom's subsidiaries, which enables more rapid and reliable transactions in their shares when restructuring the corporate group.

Report Profile

GRI 102-46

The Public Annual Report (hereinafter referred to as the Report) of Joint-Stock Company Atomenergoprom (hereinafter referred to as JSC Atomenergoprom or the Company) for 2020 has been prepared in the integrated format. The Report provides an integrated account of the Company's strategy and JSC Atomenergoprom's key financial, economic and operating results for 2020. The Report also outlines the Company's achievements in the sphere of nuclear and radiation safety, environmental protection, contribution to the development of the towns and cities where nuclear facilities are located, implementation of the social policy and other aspects of sustainable development.

GRI 102-50
GRI 102-51
GRI 102-52

JSC Atomenergoprom publishes its reports on a yearly basis. The previous annual report was published in 2020. This Report covers the operating results of the Company and its organisations for the period from 1 January through 31 December 2020. It also discloses some information on and the results of the Russian nuclear industry as a whole.

The annual report of JSC Atomenergoprom is approved by the Board of Directors.

Standards and regulatory requirements

The Report has been prepared in accordance with the following documents:

- The Uniform Industry-Wide Public Reporting Policy of ROSATOM and the Uniform Industry-Wide Methodological Guidelines (Standard) on Public Reporting of ROSATOM and Its Organisations;
- The International Integrated Reporting Framework of the International Integrated Reporting Council (The International <IR> Framework);

GRI 102-54

- The Global Reporting Initiative (GRI) Sustainability Reporting Standards. This report has been prepared in accordance with the GRI Standards: Core option;
- The AA1000 AccountAbility Principles (2018);
- Federal Law No. 208-FZ on Joint-Stock Companies dated 26 December 1995;
- Regulations of the Bank of Russia No. 454-P on Disclosure of Information by Issuers of Issue-Grade Securities dated 30 December 2014.

Process for determining the materiality of disclosures

The materiality of information was determined through the following process:

- A working group compiled a list of material topics related to the Company's operations;
- The Company's management and members of the working group preparing the Report prioritised material topics (based on the assessment of materiality of each of the proposed topics);
- Following the 'two-stage filtering', a list of material topics to be disclosed in the Report was compiled.

The decision to include various GRI performance indicators and performance indicators stipulated in the Public Reporting Standard of JSC Atomenergoprom was based on the materiality of the topics to which the indicators are related. The boundaries of information disclosure on various topics were determined by the working group. Environmental disclosures in accordance with the GRI 303, 304, 305, 306 and 307 Standards are provided within the scope of ROSATOM.

Verification of reporting information

Reporting information was certified as accurate and reliable by an independent auditor which certifies the annual financial statements. Non-financial reporting information was certified as reliable by an independent auditing organisation which certified the Report's compliance with the GRI SRS Standards (the Core option).

Disclaimer

The Report contains information about the Company's medium- and long-term objectives and initiatives. The objectives are forward-looking, and their actual achievement will depend, among other things, on a number of economic, political and legal factors beyond the Company's control (the global financial, economic and political environment; situation on the key markets; amendments to the tax, customs and environmental legislation, etc.). Therefore, actual performance in the future years may differ from the forward-looking statements contained herein.

GRI 102-14

Message from the Management

Ekaterina Lyakhova
Chair of the Board of Directors
of JSC Atomenergoprom

Kirill Komarov
Director of JSC Atomenergoprom

Dear colleagues and partners,

We would like to present the annual report of JSC Atomenergoprom for 2020.

In the reporting year, the Company had to operate in a challenging environment amid the coronavirus pandemic. JSC Atomenergoprom demonstrated its resilience in times of crisis and its social responsibility by contributing to the fight against COVID-19.

Within a very short time, enterprises in the industry provided the necessary capabilities for working remotely, protecting employees and rotating the personnel at overseas sites. Special precautions were taken to protect those employees who possess critical knowledge. The Company arranged regular testing. Backup was provided for all senior executives in the industry. The Company also launched a large-scale vaccination campaign covering not only its employees but also the residents of nuclear towns and cities. As at the date of this Report, over 75,000 people had already been vaccinated.

Radiation technology developed by the Company was used in order to sterilise several dozens of millions of medical face masks.

At the same time, 2020 is a landmark year as it marks a double anniversary: that of the victory in the Great Patriotic War and the 75th anniversary of establishment of the nuclear industry.

In 2020, JSC Atomenergoprom remained a leader in low-carbon power generation in Russia. Electricity output at NPPs reached a new all-time high of 215.7 billion kWh, accounting for 20.3% of the country's total electricity output. This helped to prevent greenhouse gas emissions totalling 108 million tonnes of CO_2 equivalent.

The Company also demonstrated a strong financial performance in difficult times. Its revenue under IFRS increased by 4.8% year on year to RUB 931.6 billion, while EBITDA reached RUB 344.6 billion. Profit under IFRS for the reporting period totalled RUB 169.1 billion.

Despite having to operate in a challenging environment, the Company achieved all its operational targets. It completed the power start-up of new generation 3+ nuclear power units equipped with VVER-1200 reactors and meeting the highest safety standards at Leningrad NPP-2 and the Belarusian NPP.

The Company operates on a global scale; its product portfolio includes 11 strategic programmes. New products offered by the Company provide new opportunities for developing healthcare and municipal infrastructure, improving environmental safety and making progress in other key areas relevant to sustainable development.

JSC Atomenergoprom's portfolio also includes the wind power generation business. In 2020, two of the Company's wind farms (the Adygea Wind Power Plant and the Kochubeyevskaya Wind Power Plant) started to supply electricity to the Russian wholesale market, with the capacity of wind power plants to be built by the Company totalling 1.2 GW.

Safety remains our top priority. Throughout 2020, all nuclear facilities operated safely and reliably.

In the coming year, the Company aims to break the record for electricity output, secure contracts for the construction of new small-scale nuclear power plants, namely five floating power units, and put new wind power plants into operation.

The Company's objectives in the sphere of international business include achieving first criticality at power unit No. 2 of the Belarusian NPP and obtaining licences for NPP construction in Europe.

In 2021, the Company plans to launch a research programme focused on hydrogen-based nuclear energy in cooperation with foreign partners and to develop technological solutions for the incineration of minor actinides and reusing regenerated fuel.

We would like to thank all employees of JSC Atomenergoprom's organisations for the work that they have done. By working together, we will be able to rise to any challenges and accomplish our ambitious strategic objectives!

GRI 102-7
GRI 102-2

JSC Atomenergoprom Today

JSC Atomenergoprom is an integrated company that consolidates civilian assets of the Russian nuclear industry.

JSC Atomenergoprom is an organisation of State Atomic Energy Corporation Rosatom (ROSATOM). ROSATOM pursues the governmental policy and ensures unity of management of the nuclear industry and sustainability of the nuclear power generation complex; it develops Russia's innovative potential in the nuclear industry, oversees the nuclear-powered icebreaker fleet and ensures nuclear and radiation safety. ROSATOM is tasked with fulfilling Russia's international commitments related to the peaceful use of nuclear energy and maintaining the non-proliferation regime. ROSATOM aims to contribute to the federal target programmes promoting the development of the nuclear industry, fostering the development of nuclear power and strengthening Russia's competitive position on the global market for nuclear technologies.

The organisations of JSC Atomenergoprom comprise a complete cycle of nuclear production ranging from uranium mining to NPP construction and electricity generation. The organisations give priority to improving product quality, introducing innovative technologies and environmental management.

JSC Atomenergoprom (including JSC Atomenergoprom's group of companies) is the largest power generation company in Russia and one of the leading companies on the global market for nuclear services and technologies. JSC Atomenergoprom and ROSATOM are capable of providing turnkey solutions for NPP design and construction, supplying fuel to NPPs throughout their entire service life, upgrading NPPs, rendering maintenance services and providing employee training. JSC Atomenergoprom carries out numerous large-scale international projects and generates substantial overseas revenue.

See the section 'International Business' for details.

The Company integrates leading organisations and enterprises in the nuclear industry, whose development started 75 years ago, and possesses unique experience gained across the entire range of the nuclear fuel cycle and NPP construction technologies. In addition to traditional segments of the market for nuclear technologies and services, JSC Atomenergoprom is actively diversifying into wind power generation, nuclear medicine, composite materials, additive manufacturing, digital products, infrastructure solutions for towns and cities and other new areas of business.

See the section 'Business Diversification' for details.

No. 1 in the world
in terms of the overseas NPP construction project portfolio (36[1] power units)

No. 1 in the world
in terms of uranium enrichment (36% of the global market)

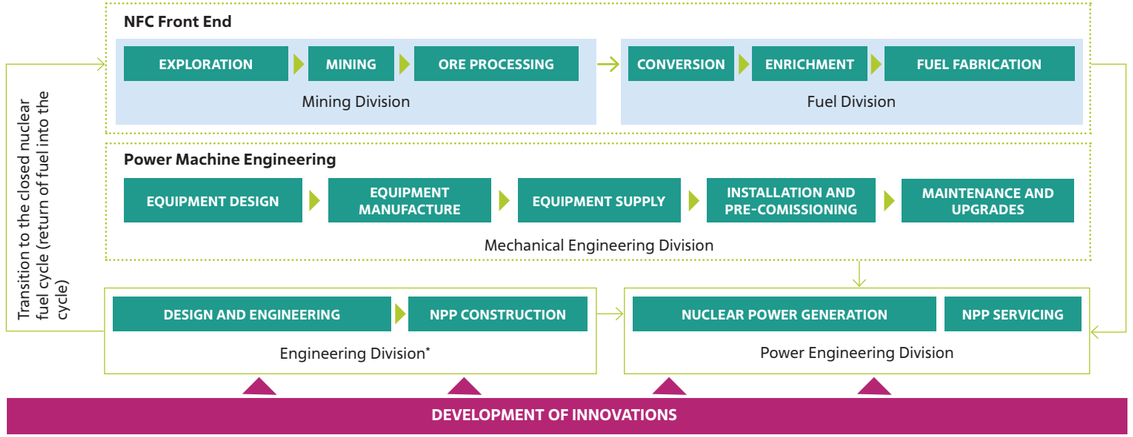
No. 2 in the world
in the world in terms of uranium resources

No. 2 in the world
in the world in terms of uranium production

No. 3 in the world
in the world in the global nuclear fuel market

20.3 %
share of electricity generation in Russia

Production and process chain of JSC ATOMENERGOPROM GRI 102-9



New Products
wind power, nuclear medicine, advanced materials and technologies, digital products, infrastructure solutions, additive manufacturing, energy storage systems, automated process control systems and electrical engineering, environmental solutions

[1] Including power unit No. 1 of the Belarusian NPP, which was synchronised with the power grid and started to supply electricity to the integrated power system of the Republic of Belarus on 3 October 2020. Including the project portfolio of ROSATOM.
* The Engineering Division forms part of ROSATOM.

History of JSC Atomenergoprom

JSC Atomenergoprom was established in July 2007 as part of the Russian Nuclear Industry Development Programme approved by the Russian President Vladimir Putin on 8 June 2007, pursuant to Federal Law No. 13-FZ on Peculiarities of the Management and Disposal of the Property and Shares of Organisations Operating in the Nuclear Power Industry and on Introducing Amendments to Selected Russian Laws of 5 February 2007, Decree No. 556 of the Russian President on Restructuring the Russian Nuclear Power Generation Complex dated 27 April 2007 and Resolution No. 319 of the Russian Government on Measures for Establishing Joint-Stock Company Atomic Energy Power Corporation dated 26 May 2007.

Regulations on the establishment of JSC Atomenergoprom stipulated a merger of 89 enterprises in all nuclear power engineering and nuclear fuel cycle segments, including three federal educational establishments. The state contributed shares of 31 companies under federal ownership to the authorised share capital of JSC Atomenergoprom upon its establishment (including shares of JSC TVEL, JSC TENEX, JSC Atomredmetzoloto, etc.). Other companies had been incorporated as federal state unitary enterprises (hereinafter referred to as FSUEs) and were subject to corporatisation to be merged with the nuclear corporation. Between 2008 and 2011, 55 FSUEs were reorganised into open joint-stock companies and merged with JSC Atomenergoprom. Thus, the formation of the Company's authorised share capital was completed.

These measures enabled JSC Atomenergoprom to start to form a new structure of the civilian branch of the nuclear industry and introduce a uniform policy on finances, corporate governance, HR management and management of non-core assets in 2011.

As at 31 December 2020, JSC Atomenergoprom's scope of consolidation in accordance with IFRS comprised 150[2] companies of different legal forms.

As at 31 December 2020, the shareholders of JSC Atomenergoprom were ROSATOM (94.4591%)[3] and the Russian Federation represented by the Russian Ministry of Finance (5.5409%).

[2] Including JSC Atomenergoprom.
[3] ROSATOM holds 100% of voting shares in JSC Atomenergoprom.

Key Events in 2020

- Electricity output at 35 power units of 10 operating NPPs and the power unit of the floating thermal nuclear power plant with two reactor units reached a new all-time high of 215.7 billion kWh.
- The team of the Russian nuclear industry won the WorldSkills Hi-Tech National Competition for the sixth time.
- No events rated at level 1 or higher on the international INES scale were detected at nuclear facilities (deviations rated at level 0 do not pose a risk to employees operating the facilities, local residents or the environment).
- The 150 MW Adygea Wind Power Plant and the 210 MW Kochubeyevskaya Wind Power Plant started to supply electricity to the Russian wholesale market.
- Six new digital products came on the open market: the Infrastructure Platform for the Hosting of Modular and Containerised Data Centres; Atombot. Procurement; the Multi-D Unified Time Schedule; Logos Strength; the Mobile Data Centre and the PILOT Access Control System.
- The Unified Industry Policy on Sustainable Development of JSC Atomenergoprom and ROSATOM was approved.
- The Company signed contracts for the supply of nuclear fuel and its components for NPPs and research reactors in the Czech Republic, Egypt and India.
- The Company reached agreement with JSC Gazprombank on raising a sustainable loan to finance the second stage of a 340 MW wind farm, with the price terms of the loan linked with the achievement of sustainable development targets at the construction and operation stages of the project.

GRI 102-7

Key Results in 2020

Indicator	2018	2019[4]	2020	2020/2019
Revenue under IFRS, RUB billion	788.1	889.0	931.6	**+4.8%**
EBITDA[5], RUB billion	243.7	346.6	344.6	**-0.5%**
Profit under IFRS, RUB billion	210.2	143.6	169.1	**+17.8%**
Assets under IFRS, RUB billion	3,196.2	3,408.2	3,716.3	**+9%**
Intangible assets, RUB billion	182.2	157.6	186.6	**+18.4%**
Nuclear power generation, billion kWh	204.3	208.8	215.7	**+3.3%**
NPP capacity factor, %	79.9	80.4	81.1	**+0.9%**
Uranium resources, '000 tonnes	520.7	512.7	509.4	**-0.6%**
Uranium production, tonnes	7,289	7,528	7,122	**-5.4%**
Overseas NPP construction projects, number of power units[6]	36	36	36[7]	-
Portfolio of orders for new products (outside the scope of the nuclear industry), RUB billion[8]	1,082.6	1,169.1	1,602.1	**+37%**
Average salary in JSC Atomenergoprom, RUB '000 per month	85.3	88.15	95.2	**+8%**
Events rated at level 1 and above on the INES scale, number	0	0	0	-

GRI 102-48
GRI 102-49

[4] Hereinafter in the Report, data for 2019 have been recalculated due to the recognition of a common-control transaction in the consolidated financial statements in 2020. ROSATOM paid for an additional share issue of JSC Atomenergoprom by transferring a 100% shareholding in JSC Isotope. As a result, the Group acquired control over JSC Isotope. Given that JSC Isotope had been controlled by ROSATOM, this transaction has been recognised in the consolidated financial statements as a common-control transaction; accordingly, comparative data for 2019 have been retrospectively adjusted.
In addition, comparative data for 2019 have been recalculated in order to reflect the effect of fair value measurement of assets and liabilities recognised as at the date of acquisition of control over TITAN 2 IC ICTAS.
[5] EBITDA = Operating results + Impairment of receivables + Depreciation and amortisation + Adjustments for non-cash items of other expenses and income. Data for 2019 have been recalculated.
[6] Including the project portfolio of ROSATOM.
[7] Including power unit No. 1 of the Belarusian NPP, which was synchronised with the power grid and started to supply electricity to the integrated power system of the Republic of Belarus on 3 October 2020.
[8] Including the order portfolio of ROSATOM.

Financial and Economic Results

Key financial results

GRI 102-7

Consolidated financial results of JSC Atomenergoprom under IFRS, RUB billion

	2018	2019	2020	2020/2019
Revenue	788.1	889.0	931.6	104.8%
Cost of sales	(496.4)	(549.8)	(608.2)	110.6%
Gross profit	291.7	339.2	323.4	95.3%
Selling and administrative expenses	(86.2)	(96.0)	(101.1)	105.3%
Other income/(expenses), net	(19.4)	(32.5)	(21.9)	67.4%
Financial income/(expenses), net	24.6	(21.2)	23.7	(111.8)%
Share in the (loss)/profit of investments accounted for using the equity method	0.8	0.6	2.8	466.7%
Gain on revaluation of shares in joint ventures	46.9	-	-	-
Income tax expense	(48.2)	(46.5)	(57.8)	124.3%
Profit for the year	210.2	143.6	169.1	117.8%
Other comprehensive income/(expenses)	21.5	(27.0)	28.9	(107.0)%
Total comprehensive income for the year	231.7	116.6	198.0	169.8%
Net operating profit after tax (NOPAT)	137.9	164.2	142.6	86.8%

In 2020, revenue increased by 4.8% year on year, or by RUB 42.6 billion. The growth was driven mainly by the following factors:

- Revenue growth in the Electricity Generation segment, mainly as a result of an increase in output;
- Revenue growth in the Mechanical Engineering segment, mainly due to an increase in the sales of equipment for foreign NPPs;
- An increase in revenue from sales of uranium products and enrichment services by the Sales and Trading operating segment driven by additional shipments to foreign markets and a rise in annual average exchange rates of major currencies during the reporting period.

Corporate profit for 2020 totalled RUB 169.1 billion, up by RUB 25.5 billion (17.8%) compared to 2019.

Total comprehensive income for 2020 rose by 69.8% to RUB 198 billion. The increase in total comprehensive income was driven primarily by foreign exchange gains in 2020 as a result of volatility in the rouble exchange rate (the Company's foreign currency assets exceed foreign currency liabilities; accordingly, the weakening of the rouble results in foreign exchange gains).

An increase in the share in the profit of investments accounted for using the equity method was caused primarily by an increase in reported profit of a joint venture, LLC Turbine Technology AAEM, in 2020.

Structure of revenue from sales to external customers by operating segment

Operating segment	2018		2019		2020	
	RUB billion	% of the total	RUB billion	% of the total	RUB billion	% of the total
Electricity Generation	429.1	54.4	507.0	57.0	517.3	55.5
Sales and Trading	137.9	17.5	142.9	16.1	158.1	17.0
Fuel	81.0	10.3	82.0	9.2	82.2	8.8
Mechanical Engineering	55.4	7.0	58.6	6.6	69.7	7.5
Mining	3.0	0.4	3.7	0.4	4.9	0.5
Other operating segments	81.7	10.4	94.8	10.7	99.4	10.7
TOTAL	**788.1**	**100**	**889.0**	**100**	**931.6**	**100**

Cost of sales

Cost structure, RUB billion

Cost of sales	2018	2019	2020	2020/2019,%
Materials and fuel	132.8	159.4	178.5	112.0
Staff costs	114.7	132.2	149.4	113.0
Cost of electricity purchased for resale and for own use	37.1	37.3	38.6	103.5
Electricity transmission services	25.7	26.0	26.0	100.0
Depreciation and amortisation	88.0	101.8	110.6	108.6
Production services of third-party contractors	23.8	28.6	31.6	110.5
Property tax and other taxes and payments to the budget	23.6	19.8	20.6	104.0
Other expenses	52.9	64.2	71.7	111.7
Changes in finished goods and work in progress	(2.2)	(19.5)	(18.8)	96.4
TOTAL	**496.4**	**549.8**	**608.2**	**110.6**

The cost of sales increased by RUB 58.4 billion (10.6%), with the growth driven mainly by the following items:

- An increase in staff costs by RUB 17.2 billion, mainly due to an increase in orders for equipment manufacture and construction and installation operations for foreign NPPs, as well as the hiring of personnel for new NPP power units;
- An increase in depreciation and amortisation expenses by RUB 8.9 billion, mainly for property, plant and equipment of nuclear power plants;
- An increase in the cost of materials by RUB 19.1 billion as a result of increased shipments of uranium products and a rise in the sales of equipment for foreign NPPs.

Structure of the statement of financial position

Key changes in the asset structure, RUB billion

	31 December 2018	31 December 2019	31 December 2020
Goodwill	43	41	48
Intangible assets	182	158	187
Property, plant and equipment	1,758	1,891	1,992
Financial investments	147	196	164
Loans issued	94	86	137
Bank deposits	17	85	80
Cash	372	262	314
Accounts receivable	309	374	403
Inventory	150	189	234
Other current assets	7	6	9
Other non-current assets	117	120	148
TOTAL	**3,196**	**3,408**	**3,716**

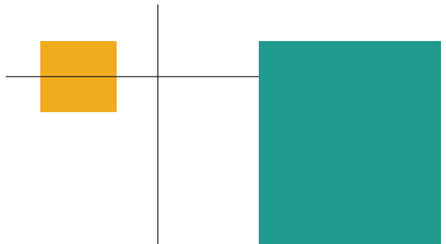
An increase in the book value of property, plant and equipment by RUB 101 billion was related primarily to investments in NPP construction in the Russian Federation and Turkey.

Financial investments decreased by RUB 32 billion, mainly as a result of the payment of bank bills in 2020.

Loans issued increased by RUB 51 billion, partly as a result of revaluation of a euro-denominated loan issued to Fennovoima Oy to finance the construction of Hanhikivi 1 NPP in Finland. In addition, in 2020, the Company issued loans to related parties.

Cash increased by RUB 52 billion.

Inventory rose by RUB 45 billion.



Accounts receivable increased by RUB 29 billion. The most significant changes were related to outstanding payments for equipment manufacture and supply under long-term contracts for NPP construction abroad.

There were no significant changes in the lines ‘Goodwill’, ‘Intangible Assets’, ‘Bank Deposits’, ‘Other Non-Current Assets’ and ‘Other Current Assets’ in 2020 compared to 2019..

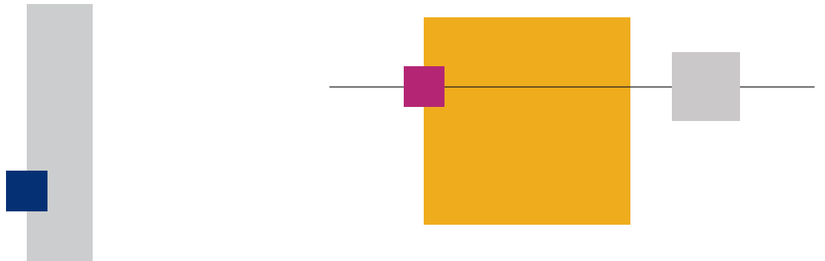
Key changes in the structure of equity and liabilities, RUB billion

	31 December 2018	31 December 2019	31 December 2020
Other liabilities	112	117	116
Provisions	166	262	279
Accounts payable	455	510	580
Borrowings	189	142	221
Non-controlling interest	331	347	344
Retained earnings	873	980	1,105
Equity	1,070	1,050	1,071
TOTAL	**3,196**	**3,408**	**3,716**

An increase in accounts payable by RUB 70 billion was caused mainly by systematic diversification of payment instruments (supply chain finance) used by the Company in its dealings with banks and other financial institutions, as well as systematic engagement with suppliers and contractors in order to improve payment terms without undermining business relationships.

Borrowings increased by RUB 79 billion as the Company obtained credit facilities from PJSC Sberbank and PJSC Sovcombank and loans from related parties. In addition, in 2020, Uranium One Inc. bonds worth RUB 12.5 billion were redeemed.

There were no significant changes in the lines ‘Provisions’, ‘Equity’, ‘Non-controlling Interest’ and ‘Other Liabilities’ in 2020 compared to 2019.



Key financial and economic indicators

Financial sustainability indicator	2018	2019	2020
Debt-to-equity ratio	0.33	0.33	0.35
Liquidity ratios			
Quick ratio	2.06	1.67	1.49
Current ratio	2.54	2.13	1.93
Turnover indicators, days			
Inventory turnover	67	70	83
Accounts receivable turnover	63	55	60
Accounts payable turnover	69	113	112
Profitability ratios, %			
Return on sales (ROS)	26.7	16.2	18.2
Return on assets (ROA)	6.6	4.2	4.6
Return on equity (ROE)	9.2	6.0	6.7

Profitability ratios increased in 2020, primarily due to a year-on-year increase in profit in the reporting period.

Cash flow

	2018	2019	2020	2020/2019,%
Cash flow from operating activities before changes in working capital	306.2	364.1	348.1	95.6
Changes in working capital	34.0	(35.2)	(31.7)	90.1
Income tax paid	(58.0)	(59.5)	(93.9)	157.8
Interest paid	(17.8)	(16.8)	(14.8)	88.1
Net cash flow from operating activities	**264.4**	**252.6**	**207.7**	**82.2**
Capital expenditures	(141.6)	(197.3)	(243.3)	123.3
Other	32.3	(86.1)	46.3	(53.8)
Net cash flow used in investing activities	**(109.3)**	**(283.4)**	**(197.0)**	**69.5**
Net changes in total debt	(18.3)	(40.0)	44.5	(111.3)
Other lease liabilities	-	(3.0)	(3.8)	126.7
Dividends paid	(18.4)	(19.7)	(23.4)	118.8
Acquisition of non-controlling interest	-	-	(7.2)	-
Net cash flow used in financing activities	**(36.7)**	**(62.7)**	**10.1**	**(16.1)**
Net (decrease)/increase in cash and cash equivalents	**118.4**	**(93.5)**	**20.8**	**(22.2)**
Cash and cash equivalents at the beginning of the reporting period	228.3	372.2	261.6	70.3
Effect of movements in foreign exchange rates on cash and cash equivalents	25.0	(17.1)	31.6	(184.8)
Cash and cash equivalents at the end of the reporting period	**371.7**	**261.6**	**314.0**	**120.0**

In 2020, cash totalling RUB 2 billion (RUB 2 billion in 2019) recorded on accounts in territorial treasury offices of the Russian Federation and raised to finance individual projects was recorded in other non-current assets as restricted cash and is therefore not included in the Financing Activities section of the cash flow statement.

In 2020, proceeds from financing activities exceeded payments for financing activities by RUB 10.1 billion.

In 2020, the Company financed its investing activities mainly with cash flow from operating activities.

Targets for 2021

According to JSC Atomenergoprom's forecasts, in 2021, the Company's revenue is projected to total RUB 1,010.9602 billion

CHAPTER 2

BUSINESS STRATEGY

2.1 Business Strategy until 2030

Business context

Trends in the development of the nuclear industry

The nuclear industry is influenced by a number of factors, including[9]:

- Global population growth from 7.8 billion people in 2020 to 8.5 billion people by 2030 and an increase in the share of urban population from 55% to 60%;
- Global GDP growth by an average of 2.4% to 3.0% per year;
- Growth of global electricity consumption. Global electricity consumption is expected to increase by 24% compared to 2020 and reach 32.8 TWh as early as in 2030. Asian countries will lead the growth, with electricity consumption in the region increasing by a factor of 1.7 (from 12.8 TWh to 21.6 TWh);
- Accelerating greenhouse gas accumulation. The global energy sector accounts for about 60% of man-made emissions, generating about 33 billion tonnes of carbon dioxide per year.

The COVID-19 pandemic resulted in a 6% decrease in emissions from the energy sector; however, analysts predict a rapid recovery and further increase in emissions. The development of low-carbon power generation, including nuclear power, is a necessary prerequisite for reducing emissions and achieving international climate targets. In recent years, environmental aspects of the electricity industry have come under closer scrutiny, which has driven an increase in the share of low-carbon power in the global energy mix. The levelised cost of electricity (LCOE)[10] for renewable energy sources has almost matched that of conventional power generation facilities, ranging from USD 60 to USD 80 per megawatt-hour.

These factors contribute to the long-term demand for nuclear energy. Leading global think tanks predict an increase in installed capacity in the nuclear power industry by 2030. The International Energy Agency, UxC consulting company and the World Nuclear Association expect to see an increase in the capacity of operating NPPs under the base case scenario to 420 – 440 GW.

[9] Data from the World Bank, the UN, the IEA World Energy Outlook 2018 (New Policy Scenario), EIU, the IAEA, the draft Programme for the Development of the Electricity Industry in Russia until 2035 and McKinsey have been used.
[10] The levelised cost of electricity (LCOE) is the net present value of the unit cost of electrical energy over the life cycle of an NPP.

The global nuclear power industry will remain competitive in the long run compared to other energy sources. Thermal power generation will yield to nuclear energy primarily because of CO2 emissions, which have a negative impact on the environment and drive up the cost of energy since many countries have imposed CO2 emission fees. Furthermore, if CO_2 capture systems are installed, the LCOE of thermal power plants increases by 40% to 60%, which makes them economically unviable. Unpredictable prices for raw hydrocarbons are yet another major disadvantage of thermal power generation.

Regarding renewable energy, even if energy generation becomes significantly cheaper, further traditional backup facilities or energy storage systems will need to be built to secure stable supplies of energy. This, in turn, will entail an increase in capital expenditure on the power grid.

The Company's competitive position[11]

The competitiveness of services provided by JSC Atomenergoprom is based on its unique facilities, technical capabilities and human resources, as well as the experience of coordinating R&D and design organisations. The Russian nuclear industry is one of the global leaders in terms of research and development in reactor design, capabilities and technologies in the nuclear fuel cycle and in the sphere of NPP operation. Russia has the most advanced enrichment technologies in the world; nuclear power plants with water-cooled water-moderated power reactors (VVERs) have proved their reliability over one thousand reactor-years of fail-free operation. Currently, JSC Atomenergoprom is the largest global market player in terms of the number of approved NPP construction projects[12].

The Company's competitive advantages:

- Integrated offer for the entire NPP life cycle, which guarantees a competitive cost per kilowatt-hour (LCOE);
- Use of reference technologies meeting the highest safety standards;
- Assistance in securing funding (including under the Build – Own – Operate (BOO) scheme) and building project infrastructure (legal framework, employee training, community relations, etc.).

[11] For information on the Company's main competitors, see the section 'Markets Served by Atomenergoprom'.
[12] Including the project portfolio of ROSATOM.

Long-term strategic goals

GRI 103-1

JSC Atomenergoprom's business strategy is underpinned by the long-term strategy of ROSATOM.

ROSATOM's business strategy until 2030 has been developed based on the goals set by the government for the civilian branch of the nuclear industry; it was updated in 2020 and approved by ROSATOM's Supervisory Board on 28 April 2020.

The development of ROSATOM and JSC Atomenergoprom is based on the long-term technological policy, which involves mastering new-generation nuclear energy technologies (including fast neutron reactors and the closed nuclear fuel cycle), as well as strengthening the export potential of Russia's nuclear technologies (construction of nuclear power plants abroad, rendering uranium enrichment services, nuclear fuel fabrication, etc.).

The mission of JSC Atomenergoprom reflects the development model that it has prioritised: the Company leverages the research, technological and manufacturing capabilities that it has developed over the years and continues to create new technologies that can help to improve the standard of living around the world.

JSC Atomenergoprom is carrying out ROSATOM's mission: to leverage the achievements of nuclear science and modern high technology for the benefit of humanity.

The COVID-19 pandemic was a major external factor in 2020, as it affects the Company not only in the short term but also in the longer term. JSC Atomenergoprom views long-term impacts of the pandemic as providing opportunities for development due to:

- Heightened public interest in a number of product areas within the sphere of competence of ROSATOM and JSC Atomenergoprom;
- Growing demand for and accelerated adoption of effective digital solutions for a variety of applications;
- Heightened interest in the global environmental agenda and sustainability initiatives.

The Company's strategy provides it with sufficient flexibility in its development to enable it to leverage the opportunities arising in the industry.

JSC Atomenergoprom's operations facilitate the implementation of the global sustainable development agenda. It contributes to the achievement of the UN Sustainable Development Goals through its product line and its efforts to ensure the sustainability of internal environmental, social and governance processes (*for details, see the section 'Sustainable Development Management'*).

The business strategy of JSC Atomenergoprom provides general guidelines for the long term, shapes the target vision of the industry for 2030 and sets a framework for development.

The vision of JSC Atomenergoprom is to become a global technological leader. Accordingly, JSC Atomenergoprom intends to expand the scale of its business to match existing global technological leaders. The vision provides an industry-wide focus on developing modern high technology and sets ambitious goals for each of the prioritised areas. Thus, the overall goal of expanding the scale of business is decomposed. In the sphere of nuclear power generation, this helps to maintain the continuity of strategic goals, enabling ROSATOM to remain an undisputed leader in the global nuclear industry.

In terms of governance, the vision involves creating a governance system meeting international standards and easily adaptable to a changing environment; customer centricity, i.e. proactively identifying customer needs, and fully unlocking the potential of our employees by providing an environment for lifelong learning and developing programmes to attract the best talent.

ROSATOM and JSC Atomenergoprom have set themselves four long-term strategic goals to be achieved by 2030:

- **To increase the international market share.** To assert their leadership on the global nuclear power market, ROSATOM and JSC Atomenergoprom are currently expanding their footprint in over 50 countries around the world and the long-term portfolio of overseas orders and increasing the corresponding revenue;
- **To reduce production costs and the lead time.** In order to develop the most competitive products, ROSATOM and JSC Atomenergoprom will take further steps to reduce the duration of NPP construction and the levelised cost of electricity (LCOE);
- **To develop new products for the Russian and international markets.** Given the accumulated knowledge and technologies of the 'nuclear project' in civilian sectors, the Company plans to increase the share of new businesses in revenue significantly by 2030;
- **To achieve global leadership in state-of-the-art technology.** ROSATOM and JSC Atomenergoprom seek to extend their global leadership beyond the nuclear industry. The Company intends to leverage its existing capabilities, the understanding of nuclear technologies and accumulated experience in order to diversify into new segments. In the future, ROSATOM aims to rank among international companies perceived as global technological leaders.

GRI 103-2

In order to implement the strategy, the following objectives must be met:

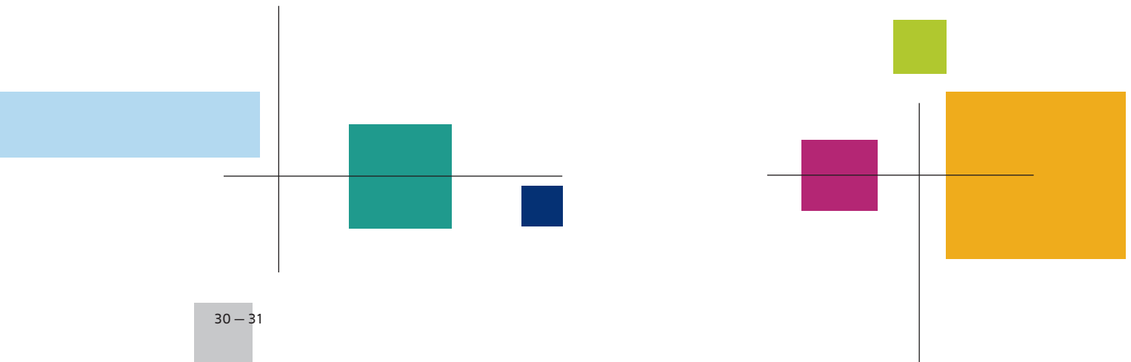
- Ensuring safe use of nuclear energy;
- Non-proliferation of nuclear technologies and materials;
- Minimising the negative environmental impact;
- Ensuring that the development of nuclear power is socially acceptable;
- Developing the innovative potential of nuclear organisations;
- Shaping a corporate culture focused on results and performance improvement;
- Ensuring full compliance with Russian legislation, including the Law on State Secrets.

Key strategy implementation risks

Key risks that can influence the achievement of strategic goals include:

- Economic risks (including financial risks, such as currency, interest rate and credit risks, etc.);
- Commercial risks (including risks associated with the nuclear fuel cycle product and service market and reputational risks);
- Operational risks (including the risk of losing critical knowledge of existing and newly created products);
- Technical (project) risks;
- Technological risks (including the risk of shortcomings in technology).

For details on the key risks, see the section 'Risk Management'.



2.2 Sustainable Development Management

GRI 102-12

As part of its commitment to sustainable development, in 2020, ROSATOM joined the UN Global Compact, the world's largest corporate sustainability (corporate social responsibility) initiative with over 13,000 corporate participants in more than 160 countries. In December 2020, ROSATOM also joined the UN Global Compact Network Russia (the Association 'National Network of the Global Compact').

In the course of its operations, JSC Atomenergoprom is guided by global sustainable development priorities and adheres to the 10 principles of the UN Global Compact. The Company contributes to the achievement of the UN Sustainable Development Goals (SDGs) through its product line, its financial and economic performance and its efforts to ensure the sustainability of internal environmental, social and governance processes.

In July 2020, the Unified Industry Policy on Sustainable Development of ROSATOM and Its Organisations was approved; it sets out JSC Atomenergoprom's position on sustainable development matters, including the goals, objectives and key principles of their efforts in the sphere of health, safety and the environment, in the social sphere and in the sphere of corporate governance.

Detailed information on the Policy is available at: https://www.rosatom.ru/sustainability/

The safety of technological solutions, safe working conditions and environmental safety are a top priority for the Company and all of its organisations. In addition, JSC Atomenergoprom is a responsible corporate citizen whose operations have a significant impact on the economy of a large part of Russian regions and a range of foreign countries where the Company is building NPPs and other facilities. The Company's efforts to develop its business both in Russia and abroad are aligned with long-term sustainable development objectives, taking into account the special characteristics of each individual region.

Nuclear technology drives systematic improvements in the quality of people's life. At present, the product portfolio of the Russian nuclear industry comprises not only conventional solutions in the sphere of nuclear power, but also new areas, such as nuclear medicine, nuclear research and technology centres based on research reactors, radiation processing facilities, etc. In addition, the Company is developing its business in a number of adjacent non-nuclear areas: wind power, production of polymer composite materials, additive manufacturing, etc.

It should be emphasised that NPP construction and operation contributes to economic and infrastructure development both in Russia and in foreign customer countries by guaranteeing long-term stable capacity utilisation for high-technology manufacturing enterprises, generating orders for companies in adjacent industries and providing employment for local communities, which translates into a corresponding contribution to GDP in the form of industry revenue and tax payments. NPP construction and operation provides employment for several thousand people, both at the plant itself and in the sphere of nuclear infrastructure.

Overall, JSC Atomenergoprom's operations contribute to the achievement of all 17 of the UN SDGs. However, given the scale of impact and the nature of the Company's business, the following Goals are of key importance:

- No. 7 (Affordable and Clean Energy);
- No. 8 (Decent Work and Economic Growth);
- No. 9 (Industry, Innovation and Infrastructure);
- No. 12 (Responsible Consumption and Production);
- No. 13 (Climate Action);
- No. 17 (Partnership for Sustainable Development).

In order to systematise sustainability initiatives across the industry, the Company has developed and approved the Uniform Industry-Wide Methodological Guidelines on the Management of Sustainability Initiatives.

Other highlights of 2020 in the sphere of sustainable development include the following:

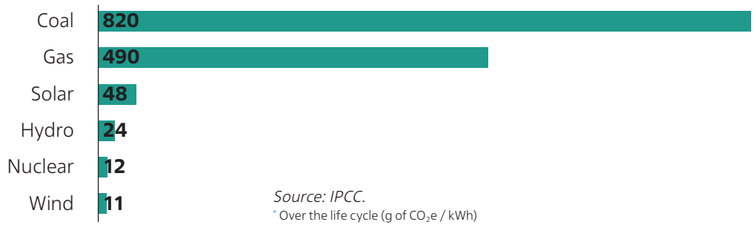
- The Company reached agreement with JSC Gazprombank on raising a sustainable loan to finance the second stage of a 340 MW wind farm, with the price terms of the loan linked with the achievement of sustainable development targets at the construction and operation stages of the project. This is the Company's first project involving the use of a sustainable financing mechanism;
- The Company contributed to the preparation of Russia's Voluntary National Review on the Achievement of the Sustainable Development Goals, which was presented at the UN High-Level Political Forum in July 2020 in an online format. The document highlights the contribution of nuclear organisations in terms of managing greenhouse gas emissions, developing the urban environment, providing environmental solutions and managing waste. The Review is available on the UN website at: *https://sustainabledevelopment.un.org/index.php?page=view&type=30022&nr=1686&menu=3170*.

Contribution to climate action

GRI 103-1
GRI 103-3

The Company has singled out the climate agenda as a major priority both because it is an important aspect of sustainable development and given the scale of the contribution of the nuclear power industry to reducing the carbon footprint in Russia and globally.

Greenhouse gas emissions*



Source: IPCC.
* Over the life cycle (g of CO_2e / kWh)

Nuclear power generation is a source of low-carbon energy that meets base load power demand. Nuclear power generation does not produce direct CO_2 emissions, which puts it on a par with renewable energy sources. The nuclear power industry produces the second lowest amount of greenhouse gas emissions over the life cycle, outperformed only by wind power generation, with emissions totalling 12 grams and 11 grams of CO_2 equivalent per kilowatt-hour respectively. At present, the operation of NPPs in Russia helps to prevent emissions totalling 100 million tonnes of CO_2 equivalent per year, while the operation of all Russian-design NPPs globally helps to prevent emissions exceeding 210 million tonnes of CO_2 equivalent per year.

Nuclear power is currently the largest source of low-carbon 'green' energy in Russia: in 2020, JSC Atomenergoprom produced 215.7 billion kWh of electricity, accounting for 20.3% of the total electricity output in the country and setting an all-time record in the history of the Russian nuclear power industry.

In order to expand the range of clean energy solutions, the Company has been developing the wind power business since 2017. Its first project in this area is the 150 MW Adygea Wind Power Plant, which started to supply electricity to the Russian wholesale market in March 2020. Later, in December 2020, the 210 MW Kochubeyevskaya Wind Power Plant was put into operation and started to supply electricity to Russia's integrated power system in January 2021. It is currently the largest wind power plant in the country. The portfolio of wind power plants to be built by the Company by 2024 totals 1.2 GW, or more than 30% of the Russian wind power market[13].

GRI 103-2

[13] The share was calculated taking into account WPP construction projects in Russia awarded to JSC NovaWind as part of the DPM 1.0 programme (estimates as at 31 December 2020).

GRI 103-2
GRI 103-3

The Company attaches great importance to developing low-carbon hydrogen energy production, which is a promising area. In 2018, hydrogen energy production was included in the Company's list of prioritised areas of scientific and technological development. The Russian nuclear industry has extensive technological and research capabilities for developing key hydrogen production techniques: electrolysis, which is one of the most environmentally friendly hydrogen production techniques, and steam methane reforming, which involves the use of CO_2 capture technology. The Company is focused on developing technologies for low-carbon hydrogen production and storage and participating in pilot hydrogen projects both in Russia and abroad. Given the global objective of decarbonising transport, industry and the energy sector, this area provides considerable opportunities for international cooperation.

Sustainable products

The product portfolio of nuclear organisations comprises more than 80 existing and future-oriented high-technology products and services. All of these products are aimed at improving the quality of people's lives and contribute to the achievement of the UN Sustainable Development Goals, each in their own way. When developing new businesses, the Company focuses particularly on environmental impacts, value creation for end users and assessment of product solutions in terms of their alignment with the UN SDG priorities.

Examples of sustainable products include:

- *Nuclear power plants:* affordable low-carbon power, job creation and industry capacity utilisation;
- *Environmental solutions:* waste management and site remediation;
- *The Smart City:* digital solutions for the urban environment and infrastructure development;
- *Nuclear medicine and isotope products:* protecting people's health and improving the standard of living;
- *Water treatment and desalination:* access to clean water and sanitation;
- *Multipurpose irradiation centres:* alleviating hunger, protecting people's health and improving the standard of living;
- *Development of the Northern Sea Route:* logistical solutions and development of maritime infrastructure.

Sustainable operations

The Company's sustainable development initiatives involve continuous process improvement, implementation of health, safety and environmental projects and industry-wide public reporting, corporate social responsibility initiatives and volunteering, development of a supply chain management system, as well as personnel management and development of the talent pool.

Environmental aspect (E). The Company seeks to align its operations with the 'Do No Significant Harm' principle, which involves minimising pollution, the negative impact on ecosystems and risks to human health.

The Company has adopted the Uniform Industry-Wide Environmental Policy (2008[14]). As part of its implementation, the Company annually takes measures to improve environmental safety and preserve the environment in the course of operations of nuclear organisations. To monitor progress and assess the efficiency of sustainable development processes in the sphere of environmental protection and environmental impacts, the Company uses such key indicators as the volume of pollutant emissions, water withdrawal, the area of restored land, the share of enterprises that have undergone certification in accordance with the ISO 14001 standard, etc.

[14] The years of approval of the first versions of the documents are stated.

The Social aspect (S) is another major aspect of sustainability of the Company's business. It includes ensuring occupational and process safety, protecting the life and health of employees in the industry and developing human potential. The Company implements social projects aimed at supporting employees in the industry and the residents of nuclear towns and cities and driving systematic improvements in the standard of living for employees and their families, local communities and consumers of the Company's products in its regions of operation.

JSC Atomenergoprom has adopted the Uniform Industry-Wide Social Policy (2013) and the Uniform Industry-Wide Policy on Occupational Safety and Health (2013). Key indicators used for assessing the efficiency of sustainable development processes in the social sphere include the LTIFR, the personnel turnover rate, the number of employees who have undergone training, the gender balance, the number of employees engaged in NPP construction, etc.

As part of the *Governance aspect (G)*, the Company is building an integrated system of industry regulation and sustainable development standards and ensures the transparency of its business by disclosing as much information as possible. In its production processes, the Company focuses on making the procurement system transparent for suppliers and building a 'sustainable' supply chain, including a requirement for compliance with environmental and social standards. The Company implements anti-corruption measures and introduces the principles of ethical business conduct on an ongoing basis.

The ROSATOM Production System has been developed and adopted in the industry; it is designed to promote a lean manufacturing culture. A quality management system has been introduced, and international standards such as ISO 14001 and ISO 9001 and other standards are applied.

Public sustainability reports are an integral part of JSC Atomenergoprom's practices to ensure the transparency of its business; they also serve as a stakeholder engagement tool. Starting from 2010, the Company annually publishes non-financial reports in accordance with the international GRI Standards.

JSC Atomenergoprom has adopted the Unified Industry Policy on Sustainable Development (2020), the Uniform Industry-Wide Public Reporting Policy (2009), the Uniform Industrial Procurement Standard (2009), the Uniform Industry-Wide Anti-Corruption Policy (2015) and the Code of Ethics and Professional Conduct (2016).

To monitor the efficiency of sustainable development processes in the sphere of corporate governance, the Company uses such key indicators as the findings of external audit of performance of the internal control system, the share of employees who have undergone anti-corruption training, the share of enterprises that have implemented measures for monitoring and recording social and environmental standards across the supply chain, etc.

2.3 Markets Served by Atomenergoprom

In 2020, JSC Atomenergoprom ranked:

- First in the world in terms of the number of NPP power units in the portfolio of foreign projects*;
- First on the global uranium enrichment market (36%);
- Second in the world in terms of uranium production (15% of the market);
- Third on the global nuclear fuel market (17%).

** Including the project portfolio of ROSATOM.*

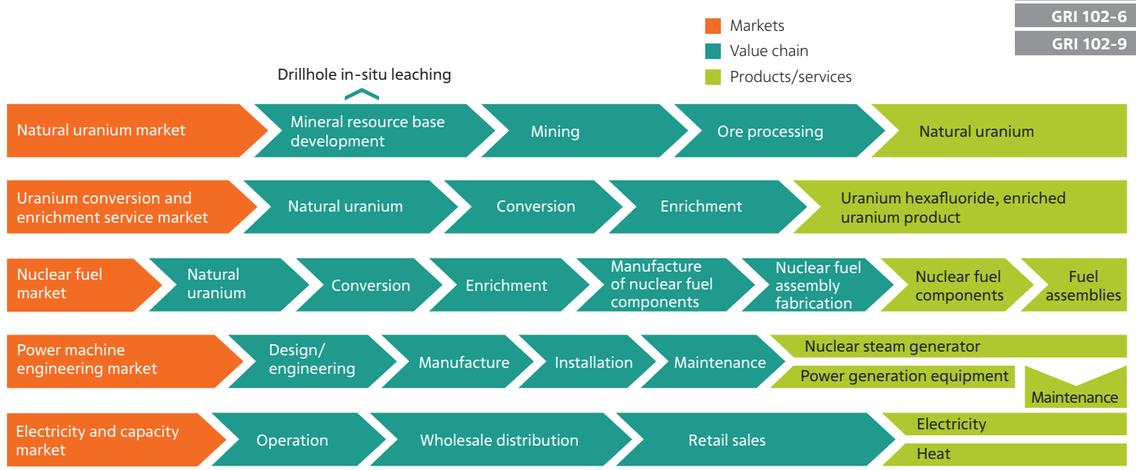
GRI 103-1

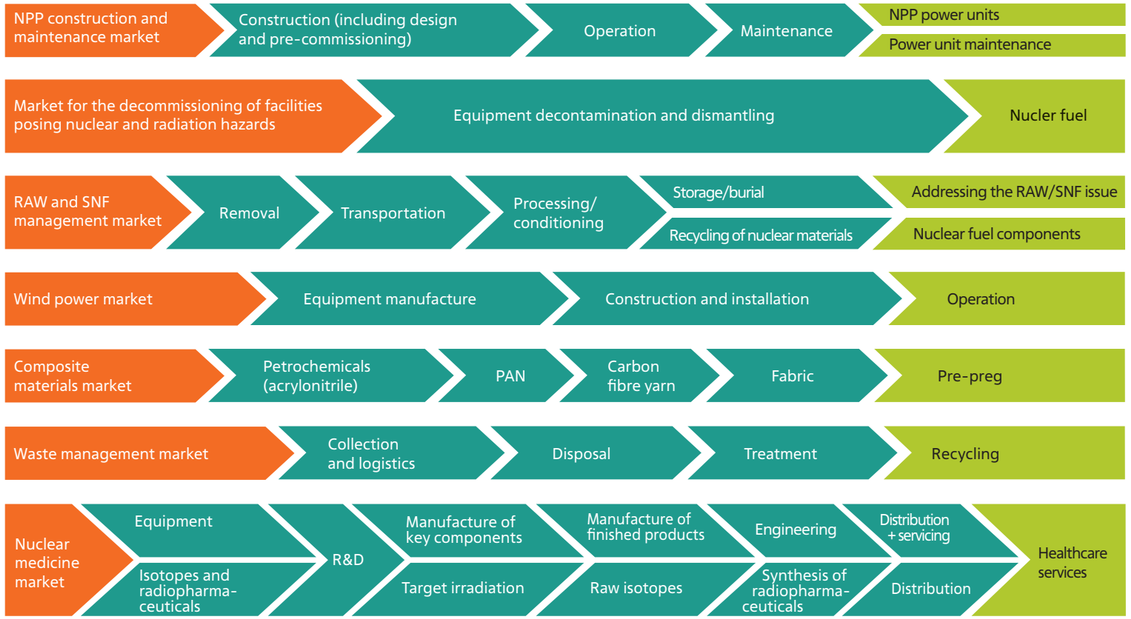
JSC Atomenergoprom's vision is to become a global technological leader. Accordingly, the Company intends not only to develop its business in traditional segments, but also to take active steps towards entering new high-technology markets as a leading research and technology company.

One of the key priorities of the Company's business is to develop globally competitive products that are able not only to effectively replace imports, but also to become leaders on global markets.

Markets served by Atomenergoprom and value chains

GRI 102-2
GRI 102-6
GRI 102-9





Traditional markets

Natural uranium market

Forecast for changes in uranium demand by 2030

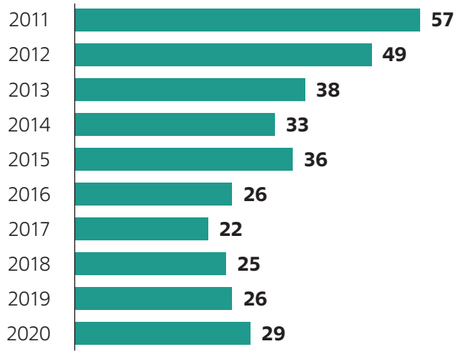
After 2011, there was a significant drop in prices on the nuclear fuel cycle front-end markets, including a long-term decline in quotations for natural uranium.

The COVID-19 pandemic had a direct impact on the spot market for uranium in 2020. As major uranium mining companies announced suspension or curtailment of production due to the risk of spread of the coronavirus infection, in March and April 2020, prices and volumes traded on the spot market soared unprecedentedly. As a number of uranium mining enterprises resumed operations by the end of the year, this partly offset the rise in spot prices. In the reporting year, spot market quotations averaged USD 29.5/lb of U_3O_8, up by 14% year on year.

In 2020, global reactor demand for uranium totalled 61,800 tonnes. At the same time, global demand taking into account commercial and strategic stockpiling not intended for current consumption is estimated at 69,600 tonnes.

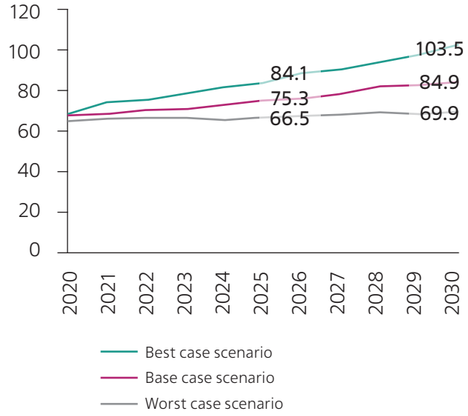
The uranium market fundamentals remain favourable. In the medium and long term, demand for natural uranium is expected to increase due to the commissioning of new power units at NPPs in China, India and other countries. According to the base case forecast of the World Nuclear Association (WNA), global reactor demand for uranium will increase to 75,000 tonnes by 2025 and to 85,000 tonnes by 2030.

Average annual spot market quotations for natural uranium, USD/lb of U_3O_8



Sources: input data from UxC[15]; average values have been calculated by JSC Atomredmetzoloto

Forecast for changes in uranium demand by 2030, '000 tonnes



Source: World Nuclear Association, 2019

[15] UxC, LLC (UxC) is an independent international company specialising in market analysis, research and forecasting covering the entire nuclear fuel cycle. It was founded in 1994. Website: https://www.uxc.com/.

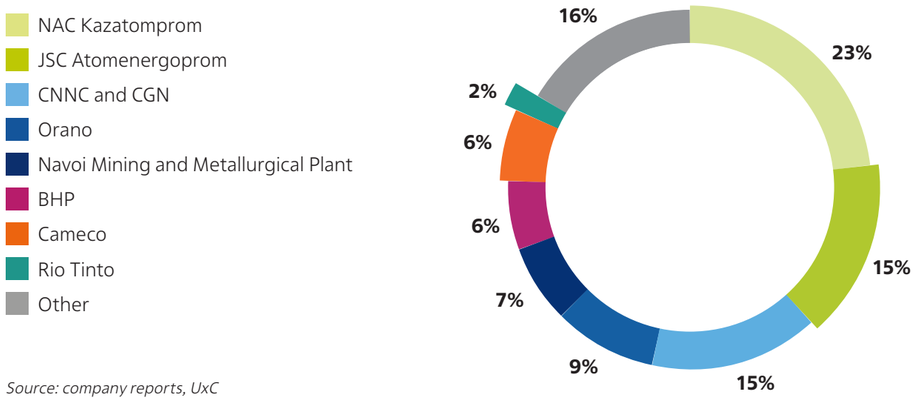
Natural uranium market overview

In 2020, global uranium production fell by 13% year on year[16] to 47,500 tonnes[17] amid production curtailment by major producers due to the COVID-19 pandemic. Global production was impacted primarily by suspension of mining operations at the Cigar Lake mine in Canada and suspension of mine development by enterprises in Kazakhstan. Progress on most projects developed by junior companies remained slow due to difficulties with raising funds and arranging product sales.

Supplies from secondary sources (inventories of energy companies and some states, repreparation of depleted uranium hexafluoride, reprocessed uranium, etc.) in 2020 were estimated at 25,000 tonnes of natural uranium equivalent.

A stable group of leaders has emerged on the natural uranium market. At year-end 2020, along with the Company (15% of the global output), the group also included NAC Kazatomprom (Kazakhstan, 23%), CNNC and CGN (China, 15%), Orano[18] (France, 9%), Navoi Mining and Metallurgical Plant (Uzbekistan, 7%), BHP (Australia – United Kingdom, 6%), Cameco (Canada, 6%) and Rio Tinto (Australia – United Kingdom, 2%). The eight largest market players account for 84% of the total uranium output.

Largest players on the natural uranium market in 2020



Source: company reports, UxC

[16] Taking into account the restatement of data on global uranium production for 2019 following the disclosure of data on mining volumes by Navoi Mining and Metallurgical Plant.
[17] Report by UxC (UxC UMO Q1 2021).
[18] In 2017, in the course of restructuring, the French company AREVA was divided into two companies: Orano (nuclear fuel cycle) and Framatome (nuclear mechanical engineering, NPP construction and maintenance). EDF became the main owner of Framatome.

According to the UxC forecast, in 2021, global uranium production will total 49,000 tonnes, while supply from secondary sources will total about 19,000 tonnes. Global production of natural uranium is expected to increase by 2030 due to rising demand. Supply from secondary sources will total about 8,000 tonnes of natural uranium equivalent in 2030.

Uranium conversion and enrichment market

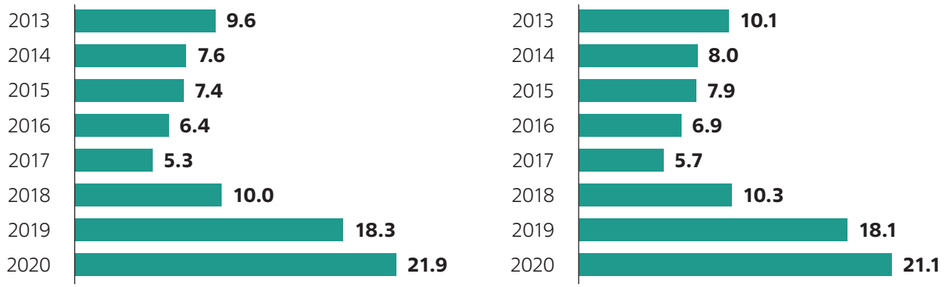
Products offered on the market include uranium hexafluoride (UF_6), uranium conversion services, enriched uranium product (EUP) and uranium enrichment services measured in separative work units (SWU).

Forecast for changes in demand for uranium conversion services by 2030

According to the base case scenario of the World Nuclear Association, in 2020, global reactor demand for uranium conversion totalled about 65,000 tonnes.

In 2020, average annual spot quotations on the North American and European markets rose by 20% and 16% respectively, while average annual long-term quotations on both markets increased by 9%. This was the result of primary supply deficit combined with significant buying interest.

Average annual spot market quotations for conversion services, USD/kg of uranium



The development of nuclear power generation until 2030 will have a positive impact on the market for uranium conversion services. According to the base case scenario of the World Nuclear Association, global demand for conversion services will grow to 70,000 tonnes by 2024 and 81,000 tonnes by 2030.

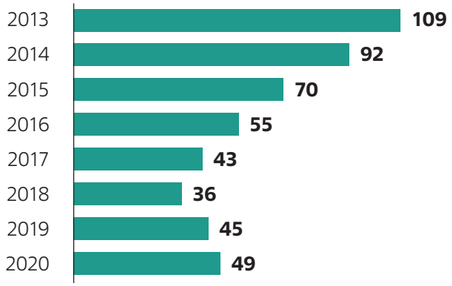
Forecast for changes in demand for uranium conversion by 2030, ‘000 tonnes

Source: World Nuclear Association, 2019.

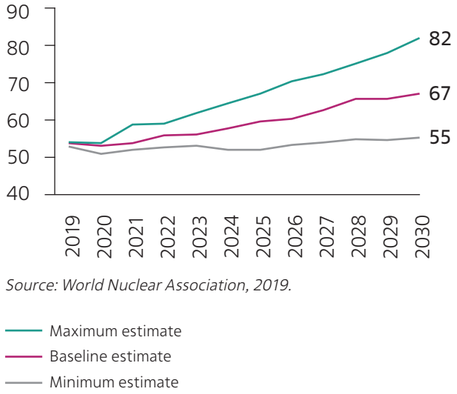
Forecast for changes in demand for uranium enrichment services by 2030

According to the Company’s estimates, global reactor demand for enrichment totalled about 55 million SWU in 2020. Amid gradual rebalancing of supply and demand on the uranium enrichment market, in 2020, average annual spot market quotations rose by 8%, while long-term quotations increased by 17%.

Average annual quotations for enrichment, USD/SWU



Forecast for changes in demand for uranium enrichment by 2030, million SWU



Source: World Nuclear Association, 2019.

The development of nuclear power generation until 2030 will have a positive impact on the market for natural uranium enrichment services. According to the base case scenario of the WNA, global demand for enrichment will grow to almost 58 million SWU by 2024 and 67 million SWU by 2030.

Uranium conversion and enrichment market overview

Along with the Company, key players on the global market for uranium conversion services include Orano (France), Cameco (Canada) and Converdyn (US).

The main players on the global market for uranium enrichment services include JSC Atomenergoprom (36% of the global market), URENCO (UK, Germany, Netherlands; 30%), Orano (France; 14%) and Chinese companies (12%). Together, they control slightly more than 90% of the market. At present, all players use modern gas centrifuge technology for uranium enrichment.

Nuclear fuel fabrication market

According to the Company, in 2020, the global nuclear fuel market capacity totalled about 11,000 tonnes of heavy metal (tHM). This includes:

- Fuel for light-water reactors requiring uranium enrichment accounting for approximately 7,000 tHM (including over 1,000 tHM of fuel for water-cooled water-moderated power reactors (VVERs));
- Fuel for heavy-water reactors accounting for approximately 3,000 tHM.

As the reactor fleet will be expanding, the demand for fabrication services may increase to 12,000 tonnes or more by 2030.

Global suppliers on the fabrication market include Westinghouse (Canada), Framatome (formerly AREVA), Global Nuclear Fuel and the Company.

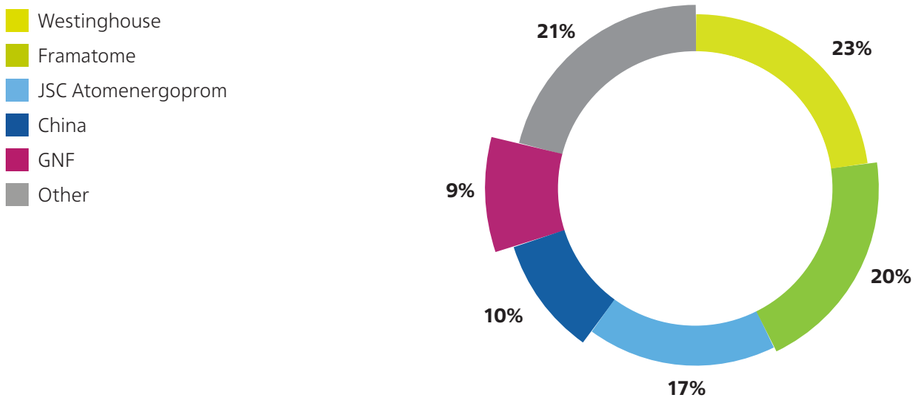
Westinghouse Electric Company fabricates nuclear fuel for nearly all types of light-water reactors (LWRs). Its major markets are the US and Western European countries. The company is the largest player holding 23% of the market.

The French Framatome produces fuel for PWR and BWR reactors and holds 20% of the global fabrication market, with Western Europe being its main end market.

Global Nuclear Fuel (GNF) is a joint venture of GE and Hitachi. It consists of two divisions: GNF-J operating in Japan and GNF-A operating on other markets. The company only produces fuel for BWR reactors and holds 9% of the market.

In 2020, Russian nuclear fuel fully met the demand of Russia, the Czech Republic, Slovakia, Hungary, Bulgaria and Armenia for reactor fuel. The Company also partially met the demand of Ukraine, Finland, India and China for reactor fuel. The Company's subsidiaries, in cooperation with Framatome, also supply fuel and components from reprocessed uranium to Western European NPPs.

Shares of players on the nuclear fuel fabrication market, %



Entering new nuclear fuel markets

A separate promising area is the manufacture of fuel for fast neutron reactors. In 2020, fuel assemblies for the first full reloading of the BN-800 reactor core with MOX fuel were produced and underwent acceptance testing; this step will enable the start of a transition of the BN-800 reactor to fully operating on MOX fuel.

The Company continues to implement the Proryv (Breakthrough) Project. It involves building a fuel fabrication/refabrication module, which will produce mixed nitride uranium/plutonium fuel. In 2020, installation of process equipment of the fabrication/refabrication module was initiated, and the construction of building structures and roofs of the main buildings was completed.

For details, see the section 'Research and Innovations'.

Power machine engineering market

Power machine engineering is one of the most high-technology industries in the world. Power engineering projects are capital-intensive and time-consuming. The key objectives in the power machine engineering market are to improve energy efficiency, reduce the environmental footprint and promote economic growth by commissioning new power generation capacities.

In 2020, installed capacity of power plants globally increased by 233 GW[19]. The growth was driven by solar and wind power plants, which accounted for about 75% of newly commissioned capacities; combined with hydropower plants, their total share exceeded 80%. The large size of the share of renewable energy sources is due to the environmental agenda and postponement of commissioning of large fossil fuel power plants until 2021; among the latter, natural gas-fired thermal power plants demonstrated the largest increase in installed capacity, accounting for 15% of the total newly commissioned capacity. Over the past year, the share of coal-fired thermal power plants in the total installed capacity decreased from 31% to 30%. The share of nuclear power generation in the global installed capacity remained at around 6%.

Long-term forecasts predict that by 2030, global electricity consumption will increase by 24%.

The post-pandemic economic recovery will be accompanied by industrial growth and a growing importance of zero-carbon energy. Carbon emissions can be reduced to zero by developing hydrogen and renewable energy and abandoning fossil fuels, but this process will be resource-intensive. In the medium term, demand for liquefied natural gas (LNG) and natural gas may increase further, and they might gradually replace coal in the energy mix. In the nuclear power industry, the development of the market segment focused on small-scale reactors is supported by the development of distributed power systems. Overall, nuclear power generation can play a greater role both in the short term, by supporting economic recovery, and in the long term, by meeting stricter environmental standards.

In 2020, the Russian power machine engineering market was affected by the pandemic, which caused a postponement in project implementation. The DPM-2 modernisation programme remained a key market driver, as its active implementation led to an increase in the production of new power generation equipment in Russia in physical terms by 173%, or 3.25 GW[20]. This growth was driven primarily by an increase in the production of steam turbines, which totalled 430% in 2020. The rate of production of other types of main power generation equipment decreased: the hydraulic turbine segment declined by 61%; the production of gas turbine units fell by 21%, while the production of steam boilers and nuclear reactors plunged by 76%.

[19] IEA, Electricity Market Report, December 2020.
[20] Data from the Federal State Statistics Service.

In 2020, industrial output in Russia contracted by 3%[21] due to the pandemic; this trend also affected the power machine engineering market. However, the positions of key players on this market remained unchanged. Moreover, the share of the Mechanical Engineering Division in terms of revenue on the Russian market increased to 42%[22].

The Division produces all main equipment for Russian-design VVER reactors; it also participates in designing and producing equipment for research reactors and small-scale nuclear power plants and is expanding its capabilities in order to enter the market for equipment for Western-design reactors. To enable the Company to remain a leader on the Russian power machine engineering market, in addition to its core business, the Division is also expanding its non-nuclear business segments and sets ambitious goals in terms of expanding into new markets.

NPP construction and operation market

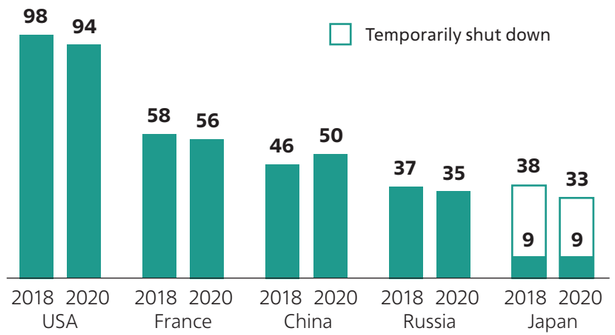
In recent years, key trends in the development of the global electricity market include heightened scrutiny of environmental aspects of the power industry and an increase in the share of zero-carbon power generation in the global energy mix. Countries seek to reduce the share of power plants using fossil fuels, such as coal and gas, and to develop renewable energy sources, such as solar and wind power plants, etc. Despite a surge in renewable power generation, its stability in the absence of expensive energy storage systems remains an unresolved issue. As a result, nuclear power generation is currently one of the most reliable, cheapest and most environmentally friendly sources of electricity. The World Nuclear Association (WNA) forecasts that by 2030, the global installed capacity of NPPs will reach 431 GW[23], which reflects steady growth of nuclear power generation.

In 2020, the nuclear power industry accounted for 10%[24] of the global electricity supply. According to the IAEA[25], in 12 states, more than a quarter of electricity demand is met by nuclear power generation. Countries with the largest share of nuclear power generation include France and Ukraine.

According to the IAEA, as at 31 December 2020, 442[26] power reactors with a total capacity of 392.6 GW were in operation (including the suspended Japanese reactors). Another 51 reactors were under construction. In 2020, 35 power units of NPPs and the power unit of the floating thermal nuclear power plant equipped with two reactor units were in operation in Russia, with their installed capacity totalling 29.3 GW. In 2020, JSC Atomenergoprom ranked second among nuclear power generation companies globally in terms of installed NPP capacity, surpassed only by the French EDF.

[21] Data from the Federal State Statistics Service.
[22] Preliminary estimate in accordance with the methodology used by JSC Atomenergomash. The data may be revised after market players publish their annual reports for 2020.
[23] WNA World Nuclear Performance Report 2020.
[24] IEA, Net Zero by 2050.
[25] Power Reactor Information System (PRIS) developed by the IAEA (https://pris.iaea.org).
[26] Provisional data.

Leading countries by the number of operating NPP power units* in 2018 and 2020



* Excluding the floating thermal nuclear power plant.

Light-water reactors (VVER, PWR, BWR, LWGR) are the main type of reactors currently in operation in the world. They make up 92% of the global market (as a percentage of the total installed capacity).

According to the IAEA, new nuclear power generation capacities connected to the grid globally in 2020 totalled 5.5 GW.

At present, demand for NPP construction comes primarily from Asian countries, which is due to rapidly growing electricity consumption in this region. The Company is taking active steps to expand its footprint on the overseas market as a major global player with a 75%[27] market share in terms of the number of overseas NPP construction projects in its portfolio.

Overseas NPP servicing market

ROSATOM provides NPP maintenance services covering the entire life cycle: it assists in the development of nuclear infrastructure, provides personnel training and supplies equipment for training centres, provides engineering and technical support at the commissioning and operation stages, carries out maintenance, repairs and upgrades, supplies spare parts and equipment and extends the service life of NPPs.

[27] Excluding projects being implemented by companies operating only on the domestic market, heavy-water reactors and contracts for the construction of power units with a capacity of less than 1,000 GW. Data on ROSATOM include power unit No. 1 of the Belarusian NPP, which was synchronised with the power grid and started to supply electricity to the integrated power system of the Republic of Belarus on 3 October 2020.

Key end markets in this segment include foreign countries where there are Russian-design power units in operation or under construction, namely Armenia, Bangladesh, Belarus, Bulgaria, Hungary, Egypt, India, China, Slovakia, Turkey, Finland and the Czech Republic.

In the reporting year, the portfolio of power units serviced by the Company comprised 49 Russian-design NPP power units abroad.

JSC Atomenergoprom is a market leader in China, Bulgaria and Armenia, acting as a general contractor for life extension, scheduled preventive maintenance and equipment modernisation at NPPs equipped with VVER reactors.

The Company's rivals on this market include national operators and local service companies forming part of or partnered with local energy corporations, as well as large international companies (Framatome, Engie, Westinghouse, Orano).

To consolidate its position on the NPP servicing market, the Company has initiated and continues its localisation efforts in key regions by creating partnerships and joint ventures with local market players or establishing subsidiaries.

For instance, 2020 saw the launch of European Power Services Ltd. (Hungary), a joint venture of JSC Rusatom Service and MVM Group servicing Paks and Paks II NPPs, NPPs equipped with VVER reactors in Central and Eastern Europe, as well as other energy facilities in Hungary and across Central and Eastern Europe. In 2021, the Company plans to register and launch a subsidiary in the Republic of Belarus that will service the Belarusian NPP and operate in adjacent markets.

ROSATOM is also considering diversifying into the Western-design NPP servicing segment by 2030.

For details, see the section 'International Business'.

Market for radioactive waste and spent nuclear fuel management and decommissioning of nuclear facilities (back end)

Market for RAW and SNF management, processing and disposal

In 2020, the volume of SNF accumulated globally exceeded 300,000 tonnes of heavy metal (tHM). Most countries have chosen to postpone SNF management efforts, which necessitates long-term SNF storage due to a lack of available permanent disposal facilities and processing capacities. Every year, around 10,000 tHM of SNF is produced globally, of which less than 2,000 tHM is sent for processing. An increase in the amount of accumulated SNF encourages the development of the waste processing and temporary waste storage market.

Key players on the SNF storage market are Holtec (US), Orano, GNS (Germany) and SKB (Sweden).

The Company promotes its own RAW and SNF management solutions as part of an integrated offer for a balanced nuclear fuel cycle. The Company's basic solution in the field of SNF management involves spent fuel processing.

Orano and ROSATOM are the leaders on the SNF processing market.

The development of this market is closely linked to the improvement of the relevant technologies and the use of regenerated SNF processing products in the nuclear fuel cycle. A reduction in the cost of processes and an improved efficiency of separation of SNF components will significantly increase processing volumes.

The market for permanent disposal of SNF and high-level waste (HLW) is still at an early stage of development. There are no operating HLW disposal facilities at present. The possible use of deep repositories is being actively examined by the countries that have chosen the policy of direct SNF disposal: Sweden, Finland, the US and Canada.

New markets

NPP decommissioning market

By 2020, more than 190 power units had been shut down in the world. According to JSC Atomenergoprom's estimates, by 2030, the number of shut-down power units will reach approximately 300. A growing number of countries, including the Russian Federation, are adopting the 'immediate dismantling' strategy, as its total cost is lower compared to 'deferred dismantling'. For instance, the US, Germany and Sweden are already decommissioning some of their NPPs; some European Union countries (e.g. Belgium) are also making statements about 'accelerated decommissioning'. Other countries are considering a range of possibilities, including the 'deferred dismantling' of the reactor island, where most radioactive materials are concentrated.

Key market players include JSC Atomenergoprom, Energy Solutions (US), Westinghouse, Orano, Bechtel (US), Studsvik (Sweden), AECOM (US), GNS, Cavendish Nuclear (UK), North Star (US), Siempelkamp (Germany), Onet Tech (France) and Holtec (US).

The Company is preparing to decommission power units of Novovoronezh, Leningrad and Beloyarsk NPPs, is participating in NPP decommissioning in a number of European countries and is decommissioning nuclear fuel cycle facilities, namely enrichment, conversion and fuel fabrication plants.

For details, see the section 'International Business'.

Electricity and capacity market in the Russian Federation

Expansion on the electricity and capacity market remains one of the Company's top priorities. ROSATOM is one of the key power generation companies in Russia; in addition, the local market is important in terms of obtaining references for new technological solutions for their subsequent global implementation.

Between 2010 and 2019, electricity consumption in Russia grew at a moderate rate of about 0.6% per year. Although 2020 was a leap year, electricity consumption in Russia decreased by 2.3% during the year amid the coronavirus pandemic and totalled 1,050.4 billion kWh. Nevertheless, nuclear power plants maintained their role in terms of meeting base load demand; following the commissioning of a new power unit at Novovoronezh NPP-2 in late 2019, nuclear power generation reached an all-time high in the history of the Russian nuclear power industry and totalled 215.7 billion kWh in 2020. As a result, in the reporting year, ROSATOM remained a leader among power generation companies, with its share in the total electricity output in Russia amounting to 20.3% (19.0% in 2019).

Once the COVID-19 pandemic has subsided, annual electricity consumption in Russia is expected to recover in the next few years, followed by moderate growth at a rate comparable to recent years. ROSATOM's key goal remains to ensure reliable operation of nuclear power plants and remain a leader in terms of its share in the country's energy mix.

In addition to NPP construction and operation, ROSATOM also sells electricity. In the reporting year, JSC Atom Energy Trade continued to operate as the power supplier of last resort in the Kursk, Tver, Smolensk and Murmansk Regions. JSC Atom Energy Trade provides services to more than 55,000 enterprises and more than 2 million individual consumers in Russia.

In 2020, retail electricity sales by the branches and standalone divisions of JSC Atom Energy Trade totalled 14.9 billion kWh, down by 4.6% compared to 2019 (15.7 billion kWh). The decrease in sales was caused by the impact of the pandemic and the fact that a number of consumers entered the wholesale electricity and capacity market. At the same time, net electricity supply to households (and equivalent categories of consumers) in 2020 increased by 3% year on year to 4.3 billion kWh.

[28] In physical terms (tonnes).

Composite materials market

Until 2030, the global market for polymer composite materials (PCMs) is expected to grow by 4-5% per year, while the growth rate of the Russian market is projected at around 8%. In addition, the global carbon fibre market[28] is expected to grow by 11% per year, while the growth rate of the Russian market is expected to range between 11% and 20% per year (in physical terms).

Successful implementation of the Road Map for Developing a Technology for New Materials and Substances High-Technology Area (including the Polymer Composite Materials product area) will make an important contribution to the expansion of the Russian PCM market.

A further increase in the global use of composite materials is expected due to replacement of conventional materials and expansion of the areas of application. The following five high-technology industries make up about 80% of demand for carbon fibre, with consumption expected to grow exponentially by 2030:

- Wind power generation;
- The aerospace industry;
- The sports goods industry;
- The automotive industry;
- The manufacture of high-pressure gas cylinders.

Key characteristics of the market include the following:

- Composite fabrics and semi-processed materials account for 75% of demand from manufacturers of finished products;
- The maximum profitability of composite products is achieved in the final processing stages (finished products).

The world's largest carbon fibre manufacturers include Japanese (Toray, Teijin, Mitsubishi Chemical), US (Hexcel, Cytec), European (SGL, DowAksa, Solvay) and Chinese (Hengshen, Blue Star) companies.

JSC Atomenergoprom is the key Russian manufacturer of carbon fibre.

For details, see the section 'Business Diversification'.

[28] In physical terms (tonnes).

Wind power market

The global wind power market is actively developing; installed capacity of wind power plants (WPPs) is expected to increase significantly, from 0.7 TW in 2020 to about 1.1 TW and 1.8 TW in 2025 and 2030 respectively[29].

The market is highly competitive and consolidated, with the top five players accounting for 56% of the total capacity of onshore and offshore WPPs commissioned in 2020[30]. The global market remains more promising in terms of developing JSC Atomenergoprom's business.

Onshore WPPs with a total capacity of 3.4 GW are expected to be commissioned in Russia by the end of 2024 under renewable energy capacity supply agreements on the wholesale market, with the existing competitive selection mechanism to be used with regard to investment projects for the construction of power plants. According to the Company's estimates, by 2024, the total installed capacity of onshore WPPs might reach 3.6 GW, with annual turnover totalling about USD 1.4 billion.

By the end of 2024, the portfolio of wind power plants to be built by JSC Atomenergoprom will total 1.2 GW, or more than 30% of the Russian wind power market.

For details, see the sections 'Sustainable Development Management' and 'Business Diversification'.

Nuclear medicine market

In 2020, the global nuclear medicine market totalled USD 13.3 billion and is expected to reach USD 33.3 billion by 2030 (this figure refers to the total value of healthcare services provided globally).

The global market for nuclear medicine equipment totalled USD 2.6 billion and is expected to reach USD 3.3 billion by 2025.

The volume of the Russian nuclear medicine market totals about RUB 94 billion, and the market is expected to actively develop until 2030, growing by 6-7% per year, according to JSC Atomenergoprom's forecasts. Key growth drivers will include the implementation of the Healthcare National Project, a wider range of nuclear medicine procedures covered by mandatory health insurance and of high-technology healthcare services, as well as the development of healthcare infrastructure. In a number of Russian regions, new nuclear medicine centres are being built, and existing healthcare institutions are being provided with state-of-the-art nuclear medicine equipment for diagnostics and therapy.

The Company sees considerable potential for the development of nuclear medicine services for the general public. The Company has initiated projects to create a network of radionuclide therapy and nuclear medicine centres in Russia and abroad, which will provide high-quality healthcare services to patients.

ROSATOM and JSC Atomenergoprom are major suppliers of isotopes and radiopharmaceuticals for nuclear medicine in Russia. About 40% of the world's reactor units producing medical radioisotopes are located in Russia. The Russian nuclear industry accounts for 25% to 40% of global radioisotope production (depending on the types of radioisotope products). The Company's long-term goal is to rank third on the international market in terms of revenue.

In addition, the Company is a major player on the market for medical device sterilisation using radiation processing technologies.

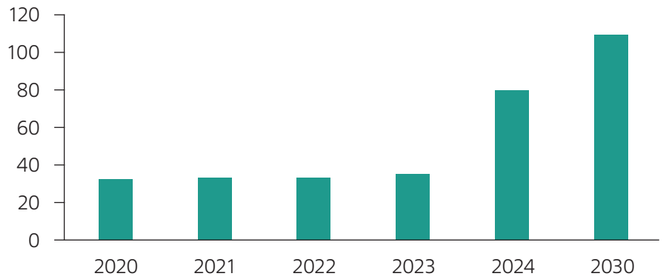
JSC Atomenergoprom also produces and actively upgrades medical equipment for diagnostics and therapy. By 2030, the Company plans to become a National Champion in a number of segments, including MRI equipment, 18 MeV linear particle accelerators, cyclotron and radiochemistry facilities, SPECT scanners and brachytherapy equipment.

For details, see the sections 'Sustainable Development Management' and 'Business Diversification'.

Market for cargo transportation along the Northern Sea Route

Mineral extraction, oil and gas production in the Arctic are projected to grow significantly, resulting in an increase in cargo traffic along the Northern Sea Route (NSR) from 32.9 million tonnes in 2020 to 80 million tonnes in 2024 and 110 million tonnes in 2030.

Projected cargo traffic along the Northern Sea Route, million tonnes



Under the Northern Sea Route Development Federal Project.

[29] Source: BNEF, Bloomberg, Capacity&Generation.
[30] Source: BNEF, Bloomberg, Wind Turbine Market Shares.

Global cargo traffic can become a driver for further growth of cargo transportation along the NSR in the long term (after 2030). Cargo transportation along the Northern Sea Route provides a number of advantages compared to traditional routes via the Suez and Panama Canals (the distance between Northern Europe and East Asia is reduced by up to 39%, while the distance between the western coast of North America and Northern Europe is reduced by up to 28%).

Waste management market

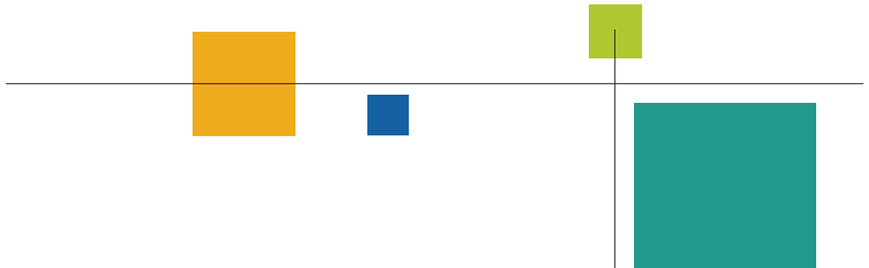
ROSATOM and JSC Atomenergoprom are implementing a strategic programme for industrial and consumer waste management and are developing the relevant infrastructure. At the time of the launch of this programme, only 1.5% of all waste was treated and recycled in an environmentally safe manner by operators that have licences for the relevant operations and the required capacities.

A Federal Project titled ‘Infrastructure for the Management of Hazard Class 1 and 2 Waste’ has been developed and approved as part of the Ecology National Project, with ROSATOM appointed as contractor under the Project. The development of an integrated system for hazard class 1 and 2 waste management involves building a state information system for hazard class 1 and 2 waste management and the relevant waste processing infrastructure.

The development of the system for hazard class 1 and 2 waste management will result in the emergence of a new market with a volume of up to RUB 20 billion per year. In 2020, the revenue of JSC Rusatom Greenway, which acts as the industry integrator in this area, totalled RUB 4.1 billion. The Company intends to expand its footprint in the waste management market, with revenue expected to reach RUB 16.1 billion in 2024 and RUB 28.3 billion in 2030.

To develop industry capabilities for the management of waste of all hazard classes, ROSATOM and JSC Atomenergoprom also plan to expand into the hazard class 3 and 4 waste management segment. In 2020, the market for hazard class 3 and 4 waste management totalled RUB 148 billion, and the Company forecasts that it will reach up to RUB 213.8 billion by 2024 and up to RUB 291.6 billion by 2030. Given the projects approved to date, JSC Rusatom Greenway plans to reach a market share of 5.2% by 2024 and no less than 4% by 2030.

For details, see the section ‘Business Diversification’.



CHAPTER 3

PERFORMANCE IN THE INTERNATIONAL ARENA

3.1

International Business

GRI 102-4

Key results in 2020:

- The overseas NPP construction project portfolio comprised 36 power units in 12 countries around the world* (including power unit No. 1 of the Belarusian NPP commissioned in 2020).
- Contracts were signed for the supply of nuclear fuel for NPPs and research reactors in the Czech Republic, Egypt and India.
- Projects were underway in more than 50 countries worldwide.

** Including the project portfolio of ROSATOM*

GRI 102-6

Promoting JSC Atomenergoprom's technologies on foreign markets

Despite the challenges posed by the COVID-19 pandemic, in 2020, the Company continued to work towards securing new orders for the construction of Russian-design NPPs abroad.

The main focus of JSC Atomenergoprom's international business is the construction of Russian-design nuclear power plants abroad. The Company promotes an integrated offer covering a wide range of areas, from uranium supply and NPP construction to assistance in project financing and personnel training. This approach is unique on the global market, which enables the Company to remain the only player in the world capable of establishing a comprehensive technological partnership in the nuclear power industry.

JSC Atomenergoprom is actively promoting Russian nuclear technologies for energy and non-energy applications both in countries that are beginning to develop nuclear power and in countries with a well-developed national nuclear power industry (including those based on Russian technology).

NPP construction abroad

In 2020, the Company's overseas NPP construction project portfolio included 36 nuclear power units. Russian-design nuclear reactors that are currently under construction fully meet international safety requirements.

NPP, country	Results
Asia	
Rooppur NPP, Bangladesh	Concreting of the fourth layer of the internal containment vessel up to the +38.500 metre level was completed at power unit No. 1. The supporting truss of the reactor at power unit No. 2 was moved into final position. The Padma River cargo terminal at the construction site of the future NPP became fully operational.
Kudankulam NPP, India	The Company was actively supplying equipment to the construction site of the second stage of Kudankulam NPP. Since the start of 2020, seven shiploads of equipment were delivered to India, including the eighth steam generator for power unit No. 4.
Tianwan NPP, China	Detailed engineering designs are being prepared for power units No. 7 and 8; long-lead equipment is being manufactured.
Xudabao NPP, China	Licensing documents are being drafted. Long-lead equipment is being manufactured.
Europe	
Paks II NPP, Hungary	The foreign customer submitted the full set of documents required for obtaining a licence for the construction of power units No. 5 and 6 for review to the Hungarian Atomic Energy Authority. Supplementary agreement No. 4 to the contract for engineering design, supply and construction of power units No. 5 and 6 of Paks NPP was signed; the agreement enables the start of soil stabilisation and waterproofing before the foreign customer obtains the licence for the construction of power units No. 5 and 6 of Paks NPP.
Belarusian NPP, Belarus	Power unit No. 1 was connected to the power grid of the Republic of Belarus. Testing was performed as part of the power start-up programme in order to commence pilot operation. The testing of safety systems with an open reactor was started at power unit No. 2 and was successfully completed in January 2021.
Hanhikivi NPP, Finland	The development of design documents for the first phase was completed, and they were approved by the Finnish customer, Fennovoima Oy.
Middle East and North Africa	
El Dabaa NPP, Egypt	Grading and levelling was completed at the sites of construction and installation facilities. Permits were obtained for the construction of the first construction and installation facilities.
Akkuyu NPP, Turkey	The supporting and thrust trusses of the reactor pit were moved into final position in the reactor building of power unit No. 1; the reactor vessel and a set of steam generators were delivered to the site. Concreting of the foundation of the reactor building was completed at power unit No. 2; the core catcher was moved into final position. The licence was obtained for the construction of power unit No. 3. Construction of storage facilities for new and spent nuclear fuel was commenced.

In 2020, the Company continued negotiations over the draft general contract for NPP construction in Uzbekistan, with engineering surveys underway on the NPP construction site in order to prepare engineering designs of the NPP.

NPP servicing abroad

JSC Atomenergoprom's product portfolio targeted at international markets includes a wide range of services covering the entire NPP life cycle: from assessing and developing key nuclear infrastructure components in customer countries to NPP decommissioning.

As part of the project to extend the life of power unit No. 2 of the Armenian NPP, in 2020, the Company completed scheduled preventive maintenance and signed contracts for the performance of work and supply of equipment in 2020 and 2021, reactor vessel annealing and upgrades to the emergency core cooling system.

2020 also saw the signing of an intergovernmental protocol to the Agreement on the Construction of Rooppur NPP concluded in 2011; the protocol establishes a framework for expanding cooperation in NPP servicing.

The Company provided support for scheduled preventive maintenance at power units No. 1 and 2 of Kudankulam NPP (India) and power units No, 1, 2 and 3 of Tianwan NPP (China), including remote support amid COVID-related restrictions imposed globally.

570 members of operating and maintenance personnel at foreign NPPs underwent training as part of long-term and short-term training programmes in 2020, including 344 employees at Rooppur NPP (Bangladesh), 126 employees at Akkuyu NPP (Turkey) and 100 employees in other regions.

The Company jointly with the expert community on nuclear infrastructure carried out an assessment of Egypt's nuclear infrastructure.

Uranium mining abroad

In 2020, uranium mining enterprises of Uranium One implemented the annual production programme in full. They produced 4,300 tonnes of uranium. A decline in production compared to previous years was caused by the suspension of operations of joint uranium mining ventures in the Republic of Kazakhstan for more than three months due to the impact of the COVID-19 pandemic.

Uranium mining by Uranium One enterprises, tonnes

	2018	2019	2020
Kazakhstan	4,375	4,617	4,276
US	10	—	—
Total	4,385	4,617	4,276

As at 31 December 2020, the mineral resource base of Uranium One enterprises (including a 100% stake in Mantra Resources Pty Limited) under international reporting standards totalled 187,000 tonnes.

The Company plans to consolidate its position on the global uranium market, develop its mineral resource base and continuously improve the economics of its natural uranium mining projects.

Export of uranium products and natural uranium enrichment services

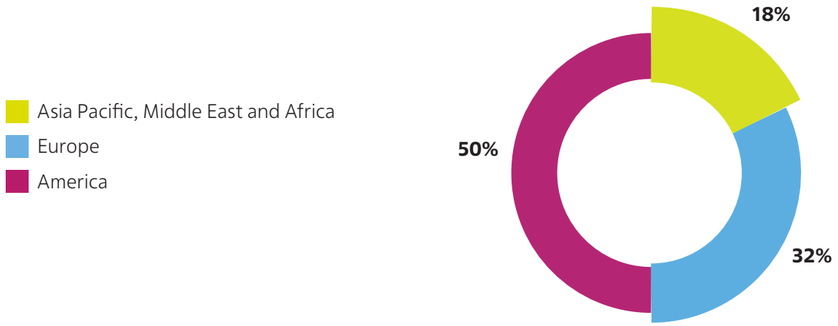
JSC TENEX is the Company's main organisation promoting uranium conversion and enrichment services on the global market and supplying enriched uranium for power and research reactors. In 2020, JSC TENEX remained one of the leading suppliers of nuclear fuel cycle front-end products.

All obligations under existing contracts in the reporting year were fulfilled by JSC TENEX on time and in full, with uranium products supplied to 41 customers in 19 countries worldwide. The annual sales volume exceeded USD 2 billion.

In the reporting year, JSC TENEX concluded 30 deals with 17 customers in seven countries (including side agreements to existing contracts). The value of the deals totalled about USD 1.6 billion.

In 2020, ROSATOM and the US Department of Commerce signed a new amendment to the Agreement Suspending the Antidumping Investigation on Uranium from the Russian Federation, enabling the Company to fulfil all of its existing contractual obligations, which include uranium supplies until the end of the next decade, and to compete for new long-term orders.

Regional structure of uranium product sales in 2020



Nuclear fuel export

The foreign revenue of JSC TVEL, which exports nuclear fuel, totalled about USD 0.7 billion in 2020. The 10-year portfolio of overseas orders reached USD 15.7 billion.

The following contract documents were signed or came into force in 2020:

- A contract with the Bangladesh Atomic Energy Commission (BAEC) for the supply of nuclear fuel for Rooppur NPP;
- A contract with the Nuclear Power Corporation of India Limited (NPCIL) for the transition of the two power units of Kudankulam NPP that are currently in operation to new fuel, TVS-2M, and the extension of the fuel cycle from 12 to 18 months;
- A contract with a Czech company (ALTA, a.s.) for the supply of a batch of fuel for the LWR-15 research reactor in the Czech Republic;
- A contract with a Czech research organisation Centrum výzkumu Řež (CVR) for the supply of a batch of uranium dioxide powder for research;
- A 10-year contract between PJSC NCCP and the Egyptian Atomic Energy Authority (EAEA) for the supply of uranium and aluminium components of low-enriched nuclear fuel for the ETRR-2 research reactor.

New products for international markets

Construction of Nuclear Research and Technology Centres, nuclear infrastructure and personnel training

In 2020, construction of a Nuclear Research and Technology Centre (NRTC) continued in Bolivia. Despite a national political crisis that arose in Bolivia in late 2019 and early 2020 and the COVID-19 pandemic, the NRTC construction is proceeding smoothly. Construction and installation at stage 1 and 2 facilities are nearing completion; process equipment has been delivered, and equipment installation and pre-commissioning are underway.

In 2020, the Company also took steps to expand the NRTC product line in order to meet the needs of foreign customers. A design concept was developed for an NRTC based on a small-scale research reactor with natural coolant circulation. Steps were taken to create a single trademark, RIVER (Research Innovative VErsatile Reactor), with differences in the capacity/type of reactor units reflected in their names.

Promoting life cycle back-end services

The Company is promoting the Balanced Nuclear Fuel Cycle, an integrated product for the back end of the nuclear fuel cycle, on the global market. This is an offer incorporating certain elements of a closed nuclear fuel cycle and enabling effective recycling of regenerated nuclear materials and a significant decrease in the volume and radioactivity level of radioactive waste sent for disposal. This is achieved through spent nuclear fuel processing and high-level waste fractionation.

In 2020, JSC TVEL, the integrator responsible for the decommissioning of facilities posing nuclear and radiation hazards, developed a comprehensive integrated offer covering the full cycle of services ranging from designing a facility to site remediation following its decommissioning. The annual revenue exceeded RUB 4 billion. 11 contracts worth a total of more than RUB 1 billion were concluded on the international market. The geographical scope of these deals includes Belgium, Finland, Germany, Spain, Bulgaria and the People's Republic of China.

Supply of isotope products

In 2020, consumption of radioactive isotope products for medical and industrial applications declined, primarily due to supply chain disruptions caused by significant restrictions on regular air travel at the height of the COVID-19 pandemic, as well as the closure and repurposing of radiological departments of numerous hospitals and research laboratories specialising in radioactive isotopes for medical applications.

Despite the existing challenges, JSC Isotope achieved considerable success in a number of product areas:

- The first batch of an active pharmaceutical ingredient based on lutetium-177 was supplied to a clinic in Italy in order to assess the quality of products manufactured in accordance with EU GMP standards as part of a production outsourcing initiative aimed at enabling the Company to expand into the radiopharmaceuticals segment on developed European and Asian markets;
- The last batch of molybdenum-100, which is used in scientific experiments aimed at searching for neutrinoless double beta decay, was delivered under a long-term contract with the Institute for Basic Science (Republic of Korea). Thus, the Russian party has fulfilled all of its obligations related to fulfilling the largest-ever order for the supply of molybdenum-100;
- A contract was concluded for the supply of a stable germanium-76 isotope to China for a new research project, PandaX-III, which involves searching for a rare physical phenomenon: neutrinoless double beta decay.

CHAPTER 4

PERFORMANCE OF DIVISIONS

4.1 Mining Division

Key results in 2020:

- Uranium resources totalled 509,400 tonnes.
- 2,846 tonnes of uranium were produced (the production programme was 103% completed).
- The Scandium project (JSC Dalur) began commercial operation: 366 kilograms of scandium oxide were sold; development of the Pavlovskoye lead and zinc mining project in the Arctic continues.

The Mining Division (its holding company is JSC Atomredmetzoloto) consolidates uranium mining enterprises in Russia[31]. The Division is implementing a number of uranium and non-uranium projects at different stages of development, from exploration to intensive commercial operation. In-house uranium production in Russia enables the Company to guarantee reliable supplies to customers, to secure long-term resources for nuclear power generation and maintain a competitive cost of production.

Operating results

Enterprises of the Mining Division produced 2,846 tonnes of uranium in 2020, which is 3% above the target.

Mineral resource base and uranium production

	2018	2019	2020
Mineral resource base, kt	520.7	512.7	509.4
Uranium production, tonnes,	2,904	2,911	2,846
including:	1,456	1,300	1240
PJSC PIMCU	590	595	585
JSC Dalur	858	1,016	1021
JSC Khiagda			

The development of uranium assets in 2020 was accompanied by further development of new uranium deposits:

- At JSC Khiagda, construction was completed and units at the Vershinnoye deposit were prepared for the start of operation;
- At JSC Dalur, geological exploration at the Dobrovolnoye deposit was completed, and construction was started at a pilot drillhole in-situ leaching site;
- PJSC PIMCU fully implemented the infrastructure construction programme for Mine No. 6.

The Division is actively adopting the most efficient uranium mining technique: drillhole in-situ leaching. In 2020, the share of uranium mined through in-situ leaching in JSC Khiagda and JSC Dalur increased to 56% of the total output.

New products

In 2020, revenue from new and non-uranium businesses accounted for nearly 30% of the Division's total revenue. It came primarily from lignite export contracts (LLC ARMZ Service) and projects to upgrade housing and utilities infrastructure in Chukotka (JSC Elkon MMP). The service companies JSC VNIPIPT and JSC RUSBURMASH demonstrated a strong performance, increasing revenue from external projects several times over (by 140% and 223% respectively),

The Scandium project (JSC Dalur) began commercial operation: 366 kilograms of scandium oxide were sold; development of the Pavlovskoye lead and zinc mining project in the Arctic continues.

The Division is developing gold deposits and has obtained another licence for gold mining in Yakutia (the Sovinoye deposit). The Division also continues to develop the Severnoye deposit.

LLC ARMZ Mining Machinery successfully started to assemble and sell mining equipment.

Social projects

The Division holds an annual contest of charity and social projects in Krasnokamensk and provides financial support (grants) to socially oriented small and medium-sized businesses. The purpose of the contest is to promote social support and social security for local residents, create social partnership and foster self-employment. In 2020, 39 important social projects received financial support totalling RUB 3.5 million.

[31] Uranium One, an organisation of JSC Atomenergoprom, mines uranium abroad (*see the section 'International Business'*).

In addition, the Division held a range of events focused on the training and development of socially-oriented entrepreneurs; these included online training sessions for social entrepreneurs; a gathering of employees of PJSC PIMCU working as volunteers, Krasnokamensk: a Town with a Warm Heart; an adventure game, A Free Niche for Social Entrepreneurship; and a talk show titled 'Doing Business in a Single-Industry Town Is Great!'

Plans and development prospects

In 2021, the Division intends to continue the planned development of uranium and non-uranium businesses:

- To complete the construction of above-ground infrastructure and begin pumping mine water from PJSC PIMCU's Mine No. 6;
- To complete the construction of supporting infrastructure facilities at the Khokhlovskoye deposit and begin the construction of facilities at the Dobrovolnoye deposit to enable pilot operations;
- To continue the development of mineral deposits forming part of the Khiagda ore field;
- To implement digital technologies as part of the pilot operation of the Smart Mine and Smart Hard Hats;
- To continue scandium production at JSC Dalur and produce mining equipment in Krasnokamensk.

4.2 Fuel Division

Key results in 2020:

- The Division fulfilled all commitments related to the supply of nuclear fuel to Russian and foreign customers.
- VVER-1200 fuel started to be used abroad.
- The first batch of MOX fuel for the full reloading of the reactor was manufactured and delivered to the plant
- Investment projects to upgrade an experimental production site for nuclear fuel fabrication at JSC Siberian Chemical Plant (JSC SCP) and to develop the core of the RITM-200 reactor unit for a small nuclear power plant were launched.
- 88 international, regional, and national patent applications for inventions were filed.

The Fuel Division (its holding company is JSC TVEL) is a leading player on the global nuclear fuel cycle front-end market and the only supplier of nuclear fuel for Russian NPPs and the nuclear-powered icebreaker fleet.

The Company is the main supplier of fuel for Russian-design VVER reactors abroad and has the necessary capabilities for the fabrication of nuclear fuel for PWR and BWR reactors and its components from reprocessed uranium (in cooperation with Framatome), as well as fuel pellets for BWR and PHWR reactors.

The Division also supplies the Russian and global markets with a wide range of non-nuclear products and services for a wide range of applications, including the metals, chemical and mechanical engineering sectors, additive manufacturing and energy storage.

The Division comprises nuclear fuel fabrication, uranium conversion and enrichment, and gas centrifuge production enterprises, as well as research and design organisations.

Enterprises of the Division are located in 10 regions of the Russian Federation, which enables effective cooperation and collaboration with partners on a wide range of issues and business areas.

Operating results

Despite the pandemic and the related lockdowns, the Division met all the targets of the 2020 production programme and made the scheduled deliveries of nuclear fuel to all Russian and foreign customers (more specifically, fuel was supplied to nuclear power plants in Hungary, the Czech Republic, Slovakia, Bulgaria and Finland).

A new version of VVER-440 nuclear fuel with an optimised water/uranium ratio was developed for Paks NPP (Hungary), and its production was commenced. The first 18 fuel bundles with the new version of fuel were delivered to the customer and loaded into the reactor of power unit No. 3 of Paks NPP.

Fuel assemblies were loaded into new Generation 3+ nuclear power units with VVER-1200 reactors at Leningrad NPP-2 and the Belarusian NPP

Pilot operation of TVS-Kvadrat fuel assemblies was completed at power unit No. 3 of Ringhals NPP (Sweden). Components of irradiated fuel assemblies were handed over to a specialised laboratory for post-irradiation examination.

On the research reactor market, contracts were signed for the supply of nuclear fuel and its components to research facilities in the Czech Republic (the LVR-15 research reactor at the Research Centre Řež) and Egypt (ETRR-2 at the Nuclear Research Centre in Inshas). Despite COVID-related restrictions, the scheduled deliveries of nuclear fuel for research reactors in Hungary and the Czech Republic were made in full.

JSC TVEL and the Nuclear Power Corporation of India Limited (NPCIL) signed an agreement on an engineering project to transition two operating power units at Kudankulam NPP equipped with VVER-1000 reactors to new TVS-2M fuel and to extend the fuel cycle from 12 to 18 months.

A full set of appendices to the contract for the supply of nuclear fuel for Rooppur NPP was signed by JSC TVEL and the Bangladesh Atomic Energy Commission (BAEC).

The first batch of uranium/plutonium MOX fuel (18 fuel bundles) was loaded into the BN-800 fast-neutron reactor at Beloyarsk NPP. The first batch of MOX fuel for the full reloading of the reactor was manufactured and delivered to the plant

A new version of RBMK nuclear fuel with increased regenerated uranium content went into production. The first fuel assemblies were delivered and started to be used in all RBMK power units.

An investment project was launched to upgrade the experimental nuclear fuel fabrication facility at the Siberian Chemical Plant (JSC SCP) to produce pilot fuel assemblies with uranium/plutonium REMIX fuel for VVER-1000 reactors.

The Division also launched an investment project to develop the core of the RITM-200 reactor unit for a small nuclear power plant. Hardware components were developed for the reactor core of a Project 10510 ultra-large nuclear icebreaker, Lider.

The installation of unique process equipment at the fuel fabrication/re-fabrication module producing dense mixed uranium/plutonium nitride (MNUP) fuel was commenced at the site of JSC SCP. The module will be one of the main elements of the Pilot and Demonstration Energy Facility, which includes a 300 MW power unit with a BREST-OD-300 fast-neutron reactor, as well as onsite facilities forming part of the closed nuclear fuel cycle.

The Division approved a programme of prioritised activities for 2020 and 2021 focused on developing uranium/plutonium fuel for thermal-neutron reactors and fabrication of fuel containing minor actinides for foreign customers to support the Balanced Nuclear Fuel Cycle product area, which combines SNF reprocessing services and fabrication of fuel containing reprocessed products.

88 international, regional and national patent applications for inventions were filed.

New products

New export contracts for lithium products were signed, and existing export contracts were renewed; the contracts are worth a total of USD 14.9 million.

Qualification of battery-grade lithium metal produced by PJSC NCCP was carried out with new customers, namely manufacturers of lithium batteries and pharmaceuticals from Japan, Europe, Canada, Israel and India.

The Division started to produce permanent magnets made of rare-earth alloys for electric generators of wind power plants. The first batch of magnets was manufactured and shipped to a factory of JSC NovaWind (ROSATOM's wind power division) and installed at the Karmalinovskaya Wind Power Plant.

The Division set up the production of several dozens of new rolled titanium products compliant with Russian and foreign standards; this included achieving positive R&D results for a technology for manufacturing 6.35 x 0.41 mm tubes.

A test sample of titanium rod was shipped to a foreign customer for subsequent production of prosthetic implants as part of a joint initiative to develop implant production.

A joint road map was signed with JSC Russian Railways for testing and arranging production and potential supplies of high-strength contact wire for a high-speed railway.

Under the R&D agreement with the European Organisation for Nuclear Research (CERN), a qualification batch of superconducting wires based on a niobium-tin compound (Nb3Sn) was manufactured with a total length of 50 km. The superconductor will be used to make a cable for the Future Circular Collider (FCC). A total of about 6,000 tonnes of superconducting strands will be required in order to build the FCC.

ROSATOM's first Additive Manufacturing Centre, an industrial 3D manufacturing facility using domestically developed technologies and equipment, was opened at the site of JSC MZP. The Centre was established as a pilot production facility with a single engineering and development centre.

LLC RusAT, an industry integrator responsible for additive manufacturing, assembled two models of printers whose operation involves laser melting of metal powder.

LLC RENERA, an industry integrator responsible for energy storage systems, implemented the first project to supply energy storage systems for onsite transport under a lease arrangement with JSC Chepetsk Mechanical Plant. LLC RENERA launched pilot production at the site of JSC MZP; an energy storage system was developed for Balkancar, a major European supplier of electric logistics vehicles, and the development of an energy storage system for LLC ARMZ Mining Machinery was commenced. The Division also initiated the development of lithium-ion traction batteries for children's electric go-karts.

JSC TVEL, an industry integrator in the Decommissioning and Management of Associated RAW business area, is actively working to consolidate the industry's capabilities and references in the sphere of decommissioning of facilities posing nuclear and radiation hazards, including preparing such facilities for decommissioning and RAW management; it is also taking active steps to expand the current portfolio of contracts. At its 21st meeting, the Commission of the CIS Member States on the Peaceful Use of Nuclear Energy supported the delegation of the powers of the core organisation of the CIS Member States responsible for SNF and RAW management and decommissioning of facilities posing nuclear and radiation hazards to JSC TVEL.

In 2020, the Division represented by the established decommissioning competence centres concluded 18 contracts; preparations for decommissioning were carried out at the following enterprises of the Division: JSC SCP, JSC Chepetsk Mechanical Plant, PJSC MSZ Machinery Manufacturing Plant, JSC VNIINM, PJSC NCCP and JSC AECP.

Preparatory work was completed on a comprehensive research and development project covering a full innovative cycle, Robotics Technologies for the Decommissioning of Nuclear Facilities. The development of robotic systems will reduce environmental damage and eliminate the use of technologies that involve personnel working in hazardous areas during the decommissioning of facilities posing nuclear and radiation hazards.

Social projects

In 2020, 22 projects worth about RUB 21 million received support following competitions of important social projects held by the Division.

JSC TVEL allocated RUB 20 million for projects supporting the Housing and Urban Environment National Project. This money was used to renovate a roller ski track (Zelenogorsk), install children's playgrounds (Seversk), redesign Kirov Street (Glazov) and renovate the central children's playground (Novouralsk).

In the towns of Glazov and Zelenogorsk, an educational project titled 'Children's Foresight' is also being implemented under an agreement with the Agency for Strategic Initiatives. As part of the project, children are provided with training in social entrepreneurship.

As part of the Agreement on Development of Children's Science Parks between JSC TVEL and NRC Kurchatov Institute, a model and a plan for cooperation in organising the Element of the Future festival of children's technologies were developed. About 100 schoolchildren from Novouralsk, Glazov, Seversk, Zelenogorsk and Elektrostal took part in online camps hosted by the Kurchatov Institute Technology Park. Following practical training, the best students will go to Artek (when COVID-related restrictions are lifted) and later will attend the finale of the festival in Novouralsk.

The Division supported the Hello, People! Inclusive Sketch Theatre in the Zelenogorsk closed administrative and territorial formation. This support provided disabled people participating in the project with an opportunity to take part in the National Festival of Art.

Contracts were signed to support the AtomClasses ('nuclear classes') established in the towns and cities where the Division's enterprises operate.

Plans and development prospects

- To participate in competitive tendering for nuclear fuel supplies to nuclear power plants in Europe.
- To develop cooperation with foreign power companies and industrial partners in order to promote TVS-Kvadrat fuel.
- To conclude new and carry out current foreign engineering contracts (to develop new versions of VVER fuel and provide engineering services related to the nuclear fuel cycle).
- To expand the range of fuel and components for foreign-design research reactors and the relevant sales footprint.
- To perform R&D as part of the development of accident tolerant fuel meeting new-generation safety standards in Russia.
- To conclude contracts for the supply of nuclear fuel components for foreign-design research reactors.
- JSC SCP plans to obtain a licence from the Federal Environmental, Industrial and Nuclear Supervision Service (Rostekhnadzor) to build a power unit with the BREST-OD-300 fast-neutron reactor (as part of the Pilot and Demonstration Energy Facility).
- To create an alliance with a foreign technology partner in the field of energy storage systems.
- To fully reload the BN-800 fast-neutron reactor unit with uranium/plutonium MOX fuel at Beloyarsk NPP for the first time.
- To expand the titanium product portfolio, as well as the relevant customer base and sales footprint.
- To optimise and modernise calcium production by electrolysis; to improve the calcium wire pressing technology and the technology for calcium treatment of steel.
- To develop capabilities in the sphere of special wires, including R&D and certification of railway contact wires for speeds of up to 400 km/h by Russian Railways.
- To start the production of refractory metals in order to replace imports.
- To upgrade lithium production facilities at PJSC NCCP, including expanding lithium metal production capacity, expanding the product range and reducing production costs.
- To build a new highly automated production line at LLC Ecoalliance in order to produce catalytic converters that meet the international Euro 6 standard, which Russia and EU countries are adopting.
- To pilot lithium hydroxide production technology at JSC AECP in order to launch the product on the market.
- To expand the geography of the nuclear decommissioning business and launch new educational programmes focused on the decommissioning of facilities posing nuclear and radiation hazards.
- To expand multilateral cooperation on R&D and education with Peter the Great St. Petersburg Polytechnic University.

4.3 Mechanical Engineering Division

Key results in 2020:

- Mechanical engineering products were delivered on time to 19 nuclear power plants in Russia and abroad.
- A contract was signed to develop engineering designs and mock-ups for the Proryv Project.
- A contract was signed for the package supply of a nuclear propulsion unit and large-size hull castings for the Lider multipurpose nuclear icebreaker.

The Mechanical Engineering Division (its holding company is JSC Atomenergomash) is one of the leading groups of mechanical engineering enterprises in Russia and the key supplier of main and auxiliary equipment for Russian-design NPPs under construction.

The Division includes engineering and design centres, major power machine engineering enterprises and smelters, as well as research and materials science organisations in Russia, the CIS and the European Union. Enterprises of the Division are located in six regions of the Russian Federation, with another three enterprises located abroad.

Operating results

In the reporting year, mechanical engineering products were delivered on time to 19 NPPs, including 9 NPPs in Russia and 10 NPPs abroad.

Production and shipment of key equipment for Rooppur and Akkuyu NPPs were completed.

Equipment for fuel collection, prototypes of control and safety system actuators and tanks of the second main circulation pump for research and industrial reactors were supplied.

The Division underwent product certification as a supplier and secured orders for the delivery of blanks for the rotors of low-pressure, high-pressure and intermediate-pressure cylinders of the steam turbine for Akkuyu NPP.

The shipment of all boiler equipment for the first waste-to-energy plant was completed, and the shipment of equipment for the second waste-to-energy plant was started.

Equipment was delivered to the Riverside waste-to-energy plant in the United Kingdom.

Tests of the first Russian large-capacity LNG pump for one of the leading oil and gas producers were successfully completed. The equipment was handed over to the customer.

Deliveries of blanks for follow-on multipurpose nuclear icebreaker No. 3 were completed.

A conceptual design for an optimised floating power unit was developed, and funding was obtained to develop the engineering design.

In 2020, the Division signed a contract for the development of engineering designs and mock-ups for the Proryv Project, as well as a contract for the package supply of nuclear propulsion units and large-size hull castings for the Leader multipurpose nuclear icebreaker.

New products

As part of its gas and petrochemical equipment business, in 2020, the Division continued to work on import substitution projects covering a wide range of critical equipment for the Russian oil and gas industry. The Division manufactured an evaporation unit for the processing of salt-containing wastewater and delivered it to ZapSibNeftekhim-2. The Division also successfully completed tests of the first Russian large-capacity LNG pump for one of the leading oil and gas producers. The equipment was handed over to the customer. The design of a full-scale bench for testing LNG production equipment at the D.V. Efremov Institute of Electrophysical Apparatus (NIIEFA) was also completed.

As part of the thermal power equipment business, the Division continued to produce and supply products for four thermal waste treatment plants in the Moscow Region; each of them has a design capacity of up to 700,000 tonnes of waste per year and is designed to generate up to 70 MW of electricity per year. At the same time, the Division continues to cooperate on the supply and modernisation of power generation equipment on foreign markets: steam superheaters were supplied to the Riverside waste-to-energy plant in the UK.

As part of the shipbuilding business, the Division entered into a contract for the manufacture and supply of a propulsion unit and large-size hull castings for the Lider nuclear icebreaker. A conceptual design was also developed, and funding was obtained to develop an engineering design for an optimised floating power unit. The conceptual design of a semi-submersible heavy transport vessel was produced, and initial technical and economic assessments of the cargo base under an agreement with foreign manufacturers on the localisation of equipment manufacture for hull systems were performed.

The supply of blanks for follow-on nuclear icebreakers was a highlight of the year in the special steel business: hull castings and propeller blanks for follow-on multipurpose nuclear icebreaker No. 3 were manufactured and shipped. JSC Atomenergomash acts as a contractor manufacturing blanks for the nuclear power industry abroad: turbine rotors and high-pressure cylinders were produced for Kudankulam NPP (power units No. 5 and 6); following a qualification process, orders were secured for Akkuyu NPP (power unit No. 4); deliveries were made to Asia, Brazil and Mexico. In the reporting year, the Division developed a special type of steel for mining equipment and a new corrosion-resistant material for equipment at El Dabaa NPP.

Social projects

In the reporting year, the Division allocated RUB 85 million for charity.

In 2020, JSC Atomenergomash took part in the Federal Programme titled ‘Creating a Comfortable Urban Environment’: funds were allocated for the landscaping of a pedestrian boulevard and for building a splash fountain in Druzhba Square in Volgodonsk.

JSC RPA CNIITMASH became one of the venues of the Company’s first Industry-Wide Blood Donor Week, with more than 150 people participating in the campaign. The project reached the finals of the Volunteer of Russia 2020 National Contest of the Best Volunteer Initiatives. In the reporting year, two blood donation campaigns were held in the enterprise.

The Atommash branch of JSC AEM-Technology launched an initiative to provide charitable support to the Palliative Care Centre in the Republic of Karelia. The enterprise also donated more than 6,000 items of personal protective equipment to other healthcare institutions and the Department of Education.

Plans and development prospects

- To ensure the supply of key equipment and perform work as part of the Company's NPP construction projects.
- To increase revenue from new products and sales on foreign markets.
- To carry out existing contracts and develop cooperation with foreign companies and industrial partners.
- To consolidate the Company's position on target markets.
- To expand the range of equipment supplied by the Company and the sales footprint.
- To develop NPP servicing and thermal power businesses abroad.
- To implement plans for integration into global supply chains of licensors, OEMs and EPC contractors.
- To produce and complete the deliveries of reactor unit equipment (RITM-200), hull castings and propellers for follow-on multipurpose nuclear icebreakers No. 3 and No. 4.
- To initiate[32] the engineering design of the Optimised Floating Power Unit.
- To produce sets of equipment for four waste-to-energy plants under construction.
- To complete the construction of Russia's first LNG test bench and put it into operation.
- To commence the pilot operation of the first Russian large-capacity LNG pump.
- To participate in competitive tendering for the supply of equipment for leading national oil, gas and petrochemical producers.
- To proceed with qualification processes for the supply of special steel products and expand the overseas business footprint.

[32] The schedule may be revised.

4.4 Engineering Division

Key results in 2020:

- Power unit No. 1 at the Belarusian NPP was connected to the grid.
- Power unit No. 2 at Leningrad NPP-2 was connected to the grid.

The Engineering Division (its holding company is JSC ASE) has well-developed capabilities for managing the construction of complex engineering facilities and is the largest player on the global market for the construction of large nuclear power plants.

The core business areas of the Division include the following:

- Design and construction of large NPPs in Russia and abroad;
- Digital technologies for managing complex engineering facilities based on Multi-D.

The Engineering Division operates in Russia, Europe, the Middle East and North Africa, as well as the Asia-Pacific Region.

In 2020, the reorganisation of the Engineering Division continued along two main dimensions: formation of the joint design institute at JSC Atomenergoproekt and formation of the Division's holding company at JSC ASE.

Operating results

Name, location	2020 highlights
Kursk NPP-2, Russia	■ All key activities scheduled for 2020 were completed on schedule. ■ In October 2020, concreting of the floor slabs of the main circulation pump (MCP) began at power unit No. 1. ■ In May 2020, the cantilever truss (the second part of the core catcher) of power unit No. 2 was moved into final position. ■ In 2020, the engineering design of the automated process control system (APCS) for power units No. 1 and 2 was approved.
Leningrad NPP-2, Russia	In October 2020, power unit No. 2 was connected to the grid for the first time
Belarusian NPP, Republic of Belarus	■ The testing of safety systems was started at power unit No. 2 (September 2020). ■ Power unit No. 1 was connected to the grid (November 2020).
Hanhikivi 1 NPP, Finland	■ Basic Design Stage 1 documents were handed over to the customer (December 2020). ■ Preparatory work is underway on the site.
Akkuyu NPP, Turkey	■ Akkuyu Nukleer obtained a licence for the construction of power unit No. 3 (November 2020). ■ The core catcher body was installed at power unit No. 2 (November 2020). ■ The reactor vessel of power unit No. 1 was delivered to the site (November 2020).
Paks II NPP, Hungary	■ The set of licensing documents for the construction of two new power units was submitted by the customer to the Hungarian supervisory authority (June 2020). ■ The construction of the first two buildings forming part of construction and installation facilities was completed (December 2020).
El Dabaa NPP, Egypt	■ Grading and levelling was completed at sites 1, 5 and 8 of construction and installation facilities. ■ Non-nuclear permits were obtained for facilities forming part of the pioneer base.
Kudankulam NPP, India	■ Contracts were signed for the supply of equipment from Russia (2018) and third countries (2020). ■ During the project, 23 shiploads of equipment for power units No. 3 and 4 were sent from Russia to India.
Rooppur NPP, Bangladesh	■ The support truss at power unit No. 2 was moved into final position (June 2020). ■ The reactor vessel and one steam generator were delivered to the construction site of power unit No. 1 (November 2020).
Tianwan NPP, China	■ In January, the conditions for the final acceptance of the nuclear island of power unit No. 3 were met 71 days ahead of schedule. ■ A preliminary safety analysis report was prepared and handed over to the customer (February 2020). ■ Detail designs of the foundation slab of the reactor building were prepared and handed over to the customer (May 2020). ■ Equipment was delivered to start the concreting at power unit No. 7 on schedule (October 2020). ■ In December, Jiangsu Nuclear Power Corporation (JNPC), the customer for the construction of Tianwan NPP, signed a final acceptance protocol for the nuclear island of power unit No. 4 after a two-year period of warranty operation.
Xudabao NPP, China	■ Detail designs of the pit were prepared and handed over to the customer (February 2020). ■ A preliminary safety analysis report was prepared and handed over to the customer (July 2020).

Social projects

In order to gain wider public acceptance for the construction of nuclear power plants, in 2020, a public counselling office was opened in Ishwardi, Bangladesh, near Rooppur NPP, which is currently under construction.

The Precise Energy Science Olympiad in mathematics, chemistry and physics was held for students of universities located in the vicinity of the Rooppur and Kudankulam NPP construction sites. More than 4,000 students from leading universities and colleges participated in the event.

As part of a series of information and communication projects to mark the 75th anniversary of the nuclear industry, the following events were held:

- The ASE International Photo Awards 2020 international photojournalism contest, with participants including Russian and foreign photojournalists from the countries where the Engineering Division operates. 300 participants submitted entries in six categories: Atom Is Here, We Are What We Eat, Still Frame, Dialogue with Nature, My Country and Portrait;
- An exhibition entitled 'Atomic Age. 75 Years of the Service to the People' in three cities in Hungary. The exhibition was held in the central squares of the cities and was visited by more than 10,000 people, including local residents, employees working at the Paks II NPP construction site and journalists. The ceremony was broadcast on YouTube; the broadcast was available to all interested parties. In addition, thematic tours were organised for the company's employees and for Russian and Hungarian schoolchildren;
- An exhibition entitled 'ROSATOM: Yesterday, Today, Tomorrow' at the construction site of Rooppur NPP (Bangladesh), in the representative office of ASE in Dhaka (Bangladesh) and in the Russian Centre for Science and Culture (Dhaka, Bangladesh). The exhibitions featured photos that showcase the origins of scientific developments, the latest achievements and modern enterprises of the Russian nuclear industry;
- A joint special project with the TASS News Agency titled 'Useful Atom': this is an educational communication project focusing on atomic energy, the history of its discovery, its application in everyday life and unique Russian developments in the peaceful use of nuclear energy.

Within a month after the launch, the audience of the project numbered more than 43,000 users.

Plans and development prospects

The strategic goals of the Engineering Division are informed by ROSATOM's strategic development priorities defined in the company's 2020 strategy. The pursuit of each of these goals makes a significant contribution to the development of the nuclear industry:

- Carrying out contracts for the construction of large nuclear power plants;
- Reducing the duration and cost of NPP construction;
- Developing advanced technologies.

In 2021, the Engineering Division plans to continue to implement its target organisational model under the previously approved plans, including the legal merger of JSC ASE EC with JSC ASE, as well as the merger of JSC ATOMPROEKT and JSC Saint Petersburg Research and Survey Institute (JSC Energy Surveys) with JSC Atomenergoproekt, subject to the fulfilment of all licensing and other obligations guaranteeing the performance of contracts of the Engineering Division on time and on budget.

4.5 Power Engineering Division

Key results in 2020:

- Electricity output at Russian NPPs reached a new all-time high of 215.7 billion kWh, or 20.3% of Russia's energy mix.
- Power unit No. 2 with a VVER-1200 reactor at Leningrad NPP-2 was connected to the grid.
- The floating thermal nuclear power plant in Pevek was put into operation.
- The capacity of NPPs in Russia totalled 29.3 GW.
- The NPP capacity factor stood at 81.07%.

The Power Engineering Division (its holding company is JSC Rosenergoatom) is the only NPP operator in Russia and a major player on the Russian electricity market.

Rosenergoatom ranks first among the largest generating companies in Russia in terms of total electricity output and second in the world in terms of installed NPP capacity.

The Division includes operating nuclear power plants, directorates of NPPs under construction, the Capital Projects Implementation Branch Office, the Technology Branch Office, Pilot and Demonstration Engineering Centres for Decommissioning (PDEC) of VVER and RBMK Reactors, a branch in the People's Republic of Bangladesh and the Akkuyu Engineering Centre.

Operating results

In 2020, electricity output at 35 power units of operating NPPs and the floating thermal nuclear power plant totalled 215.7 billion kWh, reaching a new all-time high in the history of the Russian nuclear power industry and totalling 103.9% of the balance target set by the Federal Antimonopoly Service (FAS) of Russia and 103.3% of the actual electricity output for 2019.

The NPP capacity factor stood at 81.07% in 2020 (80.4% in 2019). The share of nuclear power generation in electricity output in Russia totalled 20.3% (19% in 2019).

A floating thermal nuclear power plant (FTNPP, Pevek) started commercial operation, with heat supplied to the town's heating network.

Power unit No. 2 with a VVER-1200 reactor at Leningrad NPP-2 (commissioned in 2021) was connected to the grid. The RBMK-1000 reactor (power unit No. 2, Leningrad NPP) was permanently shut down for decommissioning after 45 years of safe operation.

A Data Centre was opened in the Republic of Tatarstan.

New products

JSC Atom Energy Trade collected more than 99% of payments for electricity bills from households and more than 50,000 legal entities in the Kursk, Smolensk, Tver and Murmansk Regions.

JSC CONCERN TITAN-2 continued its successful cooperation with the Vishnevsky National Medical Research Centre for Surgery. In 2020, a project was developed to create an innovative surgical centre that will be one of the best-equipped medical facilities in the world. The company also signed contracts with the Autonomous Non-Profit Organisation Russia – the Country of Opportunities for the construction of the first stage of the Senezh Management Lab.

JSC AtomTechEnergo completed a set of pre-commissioning activities at the Adygea Wind Power Plant, the largest wind power plant in Russia.

JSC Electrogorsk Research and Development Centre for Nuclear Power Plants Safety (JSC ENIC) launched two businesses: Integrated Project Engineering and Consulting on the Modelling of Power Systems and Consumer Power Supply Systems.

LLC C-plus continued to develop its energy service business, providing services to branches of PJSC ROSSETI to improve energy efficiency and reduce losses during electricity transmission to end users.

Social projects

In 2020, the Division held its annual contest of important social projects. Sixty applications were submitted, and four employees of the Division were awarded certificates for their projects.

In addition, in the reporting year, the Division organised the following events:

- Victory Day celebrations. 147 volunteers supported by trade union organisations congratulated more than 700 veterans and handed out Saint George ribbons;
- Beautification of a former military burial ground in Obninsk. 50 employees of the Division and students of MEPhI put up an installation titled 'Cranes' and conducted a clean-up day; in addition, the municipal government provided assistance in planting trees, bushes and flowers in one of the central streets of Obninsk;
- An intensive course titled 'STATION' and aimed at supporting the development of volunteerism, which was attended by about 100 people;
- A Volunteer School. A four-month intensive course run by the School consisted of nine online lectures followed by practical assignments. The programme included a discussion of trends in volunteerism, charity, environmentalism, healthy living and mentoring. More than 100 employees of the Division participated in the project together with their children and relatives;
- A charity event titled 'Everyone Can Do a Good Deed!', which was attended by 70 people, with RUB 81,400 collected for charity;
- A charity event titled 'The Box of Kindness' to help animals from the Scherbinka shelter. About 200 participants collected 250 kilograms of food and other essentials for the animals;
- A campaign titled 'Thank You to Doctors'; as part of the campaign, volunteers delivered 150 kilograms of pies for employees of FMBA hospitals No. 6, No. 83 and No. 85; in addition, they bought a coffee machine and 20 kilograms of coffee and sugar for the emergency department of one of the hospitals, where the staff are on duty 24 hours a day.

Plans and development prospects

The FAS of Russia has set the balance target for electricity generation at nuclear power plants in 2021 at 217.674 billion kWh.

In 2021, the Division plans to complete pre-commissioning at the ramp-up stage and to demonstrate the readiness of power unit No. 2 at Leningrad NPP-2 (equipped with a VVER-1200 reactor) for commercial operation to the commission of Rostekhnadzor. The power unit was commissioned in March 2021.

CHAPTER 5

INNOVATIONS AND NEW PRODUCTS

5.1

Research and Innovations

Key results in 2020:

- 41 technological projects were underway.
- Over 100 conceptual designs were produced and funded, covering all strategic areas of R&D and technology development in the industry.

GRI 103-1

JSC Atomenergoprom creates breakthrough technologies and innovation infrastructure to facilitate long-term development and meet the energy needs of mankind.

Implementation of the Innovative Development and Technological Modernisation Programme

GRI 103-2
GRI 103-3

In 2020, the Company updated the civilian part of the Innovative Development and Technological Modernisation Programme until 2030 (hereinafter referred to as the IDP). The IDP includes the most significant integrated innovative projects selected based on their scale and contribution to the achievement of the IDP goals and KPI targets.

The main IDP activities scheduled for 2020 were completed. Key performance targets of the IDP were achieved. In the reporting year, performance against the target for the integrated innovation KPI stood at 112%.

In 2020, the Company was implementing over 41 integrated technological projects supporting R&D and technological development in strategic areas of national importance, prioritised industry-specific areas, digitisation of the economy and modernisation of existing technologies.

18 ‘process’ projects ensured effective management of R&D, technology and innovation activities, including promoting cooperation with third-party organisations and facilitating the development of innovations in the form of infrastructure projects and programmes, as well as educational events.

Innovation activity KPIs from 2018 through 2020

KPI, unit of measurement	2018 (actual)	2019 (actual)	2020 (target)	2020 (actual)
Share of innovative products and services in the total sales of products and services across the industry, %	17.54	20.6	18.0	25.01
Number of items of intellectual property: foreign patents obtained by the Company, applications for foreign patents submitted and registered under the established procedure, registered trade secrets (know-how) reflecting the commercialisation and expansion of the scope of application of research findings in the nuclear industry (cumulative total), pcs.	1,339	1,778	2,360	2,562
Research and development costs as a percentage of the output of innovative products and services (annual decrease due to the growth of output of innovative products)	—	—	20.0	13.9
Financing of R&D projects carried out by research institutions at the request of JSC Atomenergoprom, RUB billion	3.5	4.25	4.1	4.3
Financing of R&D projects carried out by universities at the request of nuclear organisations, RUB billion	0.82	1.36	1.25	1.68

Proryv (Breakthrough) Project aimed at closing the nuclear fuel cycle

The Proryv (Breakthrough) Project is aimed at developing fast neutron reactors and closing the nuclear fuel cycle. This project will result in the development of technologies that will help to solve the problem of radioactive waste accumulation and make nuclear power plants more cost-effective.

In 2020:

- The concept of a digital twin of automated and robotised production facilities forming part of the closed nuclear fuel cycle was developed; it is based on an information model being developed for the pilot and demonstration energy facility (PDEF) and the industrial energy facility.
- The development of the engineering design of a test bench for acceptance tests of the main circulation pumping unit of the BREST-OD-300 reactor unit was completed.
- Performance specifications of the core of the BN-1200M reactor unit were determined for a gradual increase in the burnup of MNUP and MOX fuel. The design feasibility study was completed to confirm the competitiveness of the BN-1200M power unit. A preliminary design of the core of the BR-1200 reactor unit was developed.
- The programme to test MNUP fuel in the core of the BN-600 reactor is proceeding as planned. In the autumn of 2020, irradiation of an experimental fuel assembly, ETVS-11, with BREST-OD-300 fuel elements was completed. A maximum burnup of 9% h.a. was reached with a damaging dose of 107.6 dpa.
- Development of SNF reprocessing technology continued. A comprehensive test of a refining technology using an extraction and crystallisation process was completed as part of the HYDRO project. The mode of dissolution of oxidised spent MNUP fuel was confirmed for a sample with a burnup of about 7% h.a.
- Stage 1 construction and installation work continued at the PDEF site in Seversk; this included the construction of a fuel assembly production module for the BREST reactor unit and the necessary infrastructure. Preparations were initiated for stage 2 construction (a power unit with a BREST-OD-300 reactor).

Participation in innovative projects

In 2020, the Company continued to participate in the development of unique Megascience research facilities.

ITER (International Thermonuclear Experimental Reactor) project

The implementation of the project involves conducting research and developing technologies that will provide the groundwork for thermonuclear energy generation, which provides fuel resources that are virtually inexhaustible and is characterised by a high degree of safety and environmental friendliness.

In 2020, equipment and reactor systems were designed, manufactured and delivered to the construction site in accordance with the ITER construction schedule as part of Russia's commitments under the ITER project.

The following equipment manufactured as part of Russia's commitments was delivered as an in-kind contribution under the supply agreements concluded with the ITER Organisation:

- Aluminium DC busbars for poloidal coils and the central solenoid; sections of resistors and steel supports for the busbars (a total of 20 trailers) were supplied to the ITER Organisation;
- Two upper central ports were supplied to the ITER Agency of South Korea, and six upper lateral ports were supplied to the ITER Organisation;
- The first batch of bimetallic pedestals for the connectors of blanket modules was supplied to the ITER Organisation.
- As at the end of December 2020, a total offset was received amounting to 41.2% of Russia's total in-kind commitments.

In 2020, in-cash commitments to the ITER Organisation were fully met.

In 2020, Russian representatives took part in all events held by the ITER Organisation: the meetings of the ITER Council (IC-26 and IC-27), the Management Advisory Committee (MAC), the Science and Technology Advisory Committee (STAC) and the Financial Audit Board.

Objectives and plans for 2021 and for the medium term

- To fulfil all of Russia's commitments in accordance with the ITER construction schedule, including the following:
- To prepare the PF-1 poloidal field coil for delivery to the ITER Organisation;
- To start serial production of port stub extensions for the ITER vacuum vessel;
- To complete the development of experimental technologies in order to start manufacturing the components of the central assemblies of the divertor and to manufacture a full-scale prototype of the first wall panel.

Project to establish the Facility for Antiproton and Ion Research (FAIR) in Europe

RUB 895,824,500 (EUR 10,884.100) was contributed to FAIR, which corresponds to the budgetary commitments for 2020.

By the end of 2020, the Russian Federation met 56.4% of its commitments on cash contributions for the construction of the Facility for Antiproton and Ion Research in Europe (as part of allocated budget funding).

Russian organisations continued to supply equipment for the FAIR accelerator complex and detectors. To date, contracts worth a total of EUR 91.9 million have been concluded; taking into account related contracts, the amount has reached EUR 122.5 million (in 2005 prices). The contracts are being successfully performed.

Generation IV International Forum (GIF)

To date, the GIF Charter has been signed by Australia, Argentina, Brazil, the United Kingdom, Canada, China, the Republic of Korea, the USA, France, Switzerland, South Africa, Japan, the European Union and the Russian Federation. Furthermore, Australia, the United Kingdom, the European Union, Canada, China, the Republic of Korea, the USA, France, Switzerland, South Africa, Japan and the Russian Federation have signed the Framework Agreement of the Generation IV International Forum for International Collaboration on Research and Development of Generation IV Nuclear Energy Systems and are full members of the GIF Project.

The development of Generation IV reactor systems remains a topic of interest worldwide. The UK signed the Framework Agreement in 2019; in the same year, China joined the MOU to develop lead-cooled/lead-bismuth-cooled fast reactors. Turkey has declared its intention to join the GIF and has requested the consent of all GIF members to join it.

Within the framework of the GIF, six promising reactor technologies are under development, with JSC Atomenergoprom participating in the development of four of these technologies.

In 2020, a report titled ‘Analysis of Compliance of the BN-1200 Design with the Generation IV SFR Safety Design Criteria’ was prepared and published. Based on the benchmarking results, it was concluded that the BN-1200 design complied with the design safety criteria for Generation IV fast reactors, which is of great importance for consolidating Russia’s position as the global leader in the development of fast reactors.

Due the COVID-19 pandemic, events and meetings covering all areas of GIF activities were held online; Russian specialists and experts successfully participated in these events.

In 2020, a project agreement was signed for fast reactor equipment and conversion module design.

Russia’s contribution to the GIF Secretariat was paid in full.

Plan of R&D Topics

The implementation of the Consolidated Industry-Wide Plan of R&D Topics (hereinafter referred to as the CIPT) is aimed at promoting scientific and technological development in prioritised areas, including VVER technology, small-scale reactors, new materials, hydrogen energy, thermonuclear fusion, superconductivity, nuclear medicine, etc.

The R&D Plan is prepared according to a number of criteria, such as ensuring that the product/technology being developed by the Company outperforms existing analogues in terms of their main technical characteristics, as well as the export potential and national security. It also takes into account the findings of benchmarking, patent search and technology readiness assessment conducted by the Company and the commitment to accelerating research and development.

In 2020, 144 CIPT projects worth a total of more than RUB 9 billion were implemented.

In 2020, more than 70% of CIPT projects successfully progressed to the next technology readiness level (TRL).

In addition, more than 100 conceptual designs were produced and funded in 2020, covering all strategic areas of R&D and technology development in the industry.

Plans for 2021

- To arrange the participation of Russian experts in the GIF Policy and Expert Groups, in scientific, R&D and interface meetings held by various working groups and task forces within the GIF structure;
- To prepare the documents necessary for entering the System Agreement on Molten Salt Reactors;
- To prepare the documents necessary for joining the Project Agreement on Supercritical Water-Cooled Reactor (SCWR) Thermal Hydraulics and Safety.

5.2 Business Diversification

Key results in 2020:

- Revenue from new products outside the scope of the Russian nuclear industry totalled RUB 261.7 billion, making up 19.1% of the total revenue.
- The 10-year portfolio of orders for new products outside the scope of the Russian nuclear industry reached RUB 1,602.1 billion.

GRI 103-1

One of JSC Atomenergoprom's strategic goals is to develop new products. They provide new opportunities for developing healthcare and municipal infrastructure, improving environmental safety and making progress in other key areas relevant to sustainable development. In accordance with the Company's business strategy, it is intended that new products will make up 40% of the total revenue by 2030.

New businesses (those that cater primarily to markets outside the scope of the industry) are developed first and foremost in those segments where the Company has capabilities and technological know-how. This approach helps to mitigate market and technological risks. New business areas have been formed taking into account the maximum number of overlaps with existing technical, technological and research competences, including the research and production capabilities of the Company's enterprises.

GRI 103-2
GRI 103-3

The system for managing new businesses at the Company level is focused on the development of strategic programmes. At the moment, there are 11 such programmes (Wind Power, Products and Services for the Oil and Gas Industry, Industrial and Consumer Waste Management, Composite Materials, Development of the Nuclear Medicine and Technology Product Line, Energy Storage Systems Based on Electrochemical Cells, Additive Manufacturing, Digital Products, the Smart City, an International Logistics Operator, APCS and Electrical Engineering). At the same time, the Company is actively searching for areas that could become strategically important in the near future.

GRI 102-2

Results in 2020

In the reporting year, revenue from new products totalled RUB 261.7 billion, with the target set at RUB 250 billion.

The 10-year order portfolio outside the scope of the industry reached RUB 1,602.1 billion, which is 37% above the actual figure for 2019 (RUB 1,169.1 billion).

Revenue from new products and 10-year portfolio of orders for new products, RUB billion

	2018	2019	2020
Revenue from new products	196.7	227.9	261.7
10-year portfolio of orders for new products	1,082.6	1,169.1	1,602.1

GRI 102-6

Wind power

JSC Atomenergoprom is actively developing the Russian wind power market. In 2020, the Company completed the construction of the 150 MW Adygea Wind Power Plant (WPP) and the 210 MW Kochubeyevskaya WPP, with local content reaching 65%.

The Company expanded its portfolio of wind power projects on the Russian market to 1.2 GW in terms of capacity, or more than 30% of the Russian wind power market.

The Company commenced the manufacture of wind turbine components at a wind turbine plant in Volgodonsk with a total capacity of 300-350 MW per year.

Nuclear medicine

In the reporting year, JSC Rusatom Healthcare started the first stage of construction of the radiology department building of the East Siberian Cancer Centre in Irkutsk.

In order to form partnerships and increase research and production capabilities for the development of cancer treatment technologies, the Company took the following steps:

- Assembly and sale of four sets of the Elekta linear particle accelerator;
- Licensing of the Ir-Lu production site;
- Engineering tests of the KLT-6 radiation therapy facility;
- A licence was obtained from the Ministry of Industry and Trade for the production of pharmaceuticals to be sold by healthcare institutions in Moscow;
- A cyclotron and radiochemistry facility was delivered to the Kingdom of Thailand.

Vital ultra-short-lived products used for the diagnosis of cancer in children were delivered from Saint Petersburg to Moscow to provide a substitute for supplies from the Moscow manufacturer during its scheduled shutdown. The Charitable Foundation for People with Neuroblastoma and Their Families NB and the National Society of Paediatric Haematologists and Oncologists (NSPHO) thanked the Company for addressing this long-standing issue.

The first batch of an active pharmaceutical ingredient based on lutetium-177 was supplied to a clinic in Italy in order to assess the quality of products manufactured in accordance with EU GMP standards as part of a production outsourcing initiative aimed at enabling the Company to expand into the radiopharmaceuticals segment on developed European and Asian markets.

All obligations assumed under a long-term contract with the Institute for Basic Science (Republic of Korea) and related to fulfilling the largest-ever order for the supply of molybdenum-100 were fulfilled.

A contract was signed for the supply of a stable germanium-76 isotope to China for a new research project, PandaX-III, which involves searching for a rare physical phenomenon: neutrinoless double beta decay.

Composite materials

In 2020, a new high-modulus carbon fibre production line with a capacity of 40 tonnes was launched at the site of LLC Carbon and Composite Materials Plant (LLC C&CMP) in Chelyabinsk. The Company also established composite fabrics plants with a total capacity of 2,500 tonnes at the production sites of LLC Prepreg-Dubna (Moscow Region), JSC Prepreg-ACM (Moscow), LLC Argon (Balakovo) and LLC Porcher Advanced Materials (Kaluga) and a prepreg plant with a capacity of 2,000 tonnes at the site of JSC Prepreg-ACM (Moscow).

In addition, in 2020, the Company completed the construction of a PAN plant with a capacity of 5,000 tonnes in the Alabuga Special Economic Zone. In 2021, the Company plans to develop the technology and products based on PAN produced in-house for key customers. As a result, an integrated process chain for the production of carbon composite materials will be established in Russia.

The Company produced substitutes for imported composite materials for the MC-21 passenger aircraft, a line of helicopters, unmanned aerial vehicles and gas centrifuges. The Company also supplies materials for launch vehicles such as Angara and Soyuz-5 (currently at the R&D stage), the ExoMars satellite, corvettes and minesweepers, and exports non-resource high-technology products.

An agreement was concluded on the development of a Comprehensive R&D Programme titled ‘New Composite Materials: Design and Production Technologies’ with Lomonosov Moscow State University, JSC RUSNANO, NRC Kurchatov Institute and stakeholders including federal executive agencies and organisations.

Industrial equipment

In 2020, pilot tests of a cryogenic electric pump were completed. The pump will be used to load liquefied natural gas onto LNG carriers. The pump underwent pilot testing at the site of JSC Yamal LNG under normal operating conditions using liquefied natural gas; it was accepted by the customer and continues to be operated at the site.

Management of hazard class 1 and 2 waste

As part of the Federal Project titled ‘Creation of Infrastructure for Hazard Class 1 and 2 Waste Management’:

- Stages 1 and 2 of the development of a state information system for keeping records and monitoring the management of hazard class 1 and 2 waste were completed;
- A federal road map for the management of hazard class 1 and 2 waste was developed and approved;
- Input data were prepared, and environmental and engineering surveys were carried out to develop designs and cost estimates for the construction of three new industrial and engineering complexes;
- Design documents were developed and positive opinions of the State Expert Review Panel were obtained for the establishment of four industrial and engineering complexes at the sites of chemical weapons destruction facilities.

Smart City

In 2020, revenue from this business area totalled RUB 9.4 billion, with the portfolio of orders totalling RUB 41.2 billion.

The Company continued its active cooperation with the regions on the introduction of digital products forming part of this business area. Full-scale operation of the Smart City digital platform started in 11 nuclear towns and cities in six regions of Russia: Zheleznogorsk, Zelenogorsk (Krasnoyarsk Territory), Zarechny (Penza Region), Glazov (Udmurt Republic), Novouralsk, Lesnoy, Zarechny (Sverdlovsk Region), Snezhinsk, Tryokhgorny, Ozersk (Chelyabinsk Region) and Polyarnye Zori (Murmansk Region), following several months of operation in test mode.

JSC Atomenergoprom offers its solutions not only to towns and cities, but also to regions. It is currently cooperating on digitisation initiatives with the Nizhny Novgorod, Tomsk and Murmansk Regions and the Stavropol Territory. The Our North portal, a digital solution with a range of functions similar to those of the Active Citizen platform, has been developed and implemented in the Murmansk Region within the shortest possible time frame.

The progress made by Russia in the implementation of smart city technologies is recognised globally. The first voluntary national review of Russia's progress towards achieving the Sustainable Development Goals has been published on the UN website. Among other things, the review contains information on the Company's contribution to the development of the urban environment, with the Lean Smart City, a set of state-of-the-art technological solutions implemented by JSC Rusatom Infrastructure Solutions, cited as one of the best practices.

Hydrogen energy

Under the current memorandum of cooperation between the Ministry of Economy, Trade and Industry of Japan and JSC RAOS, in 2020, the Company continued to implement the planned pilot projects, including the development of a project to supply hydrogen to Japan, as well as the establishment and development of a passenger railway system on Sakhalin Island which will use trains powered with hydrogen fuel cell, as well as the relevant support systems.

Plans for 2021 and for the long term

Nuclear medicine

- To design and build Radionuclide Therapy Centres and Nuclear Medicine Centres in Irkutsk, Ufa, Stavropol, Lipetsk and Obninsk. The centres are scheduled to be launched in 2023 and 2024 and are expected to provide services to over 100,000 patients per year.
- In 2021, a multipurpose processing centre (MPC) will be put into operation in Obninsk; it will specialise in the sterilisation of medical devices and polymer modification for major industrial companies. MPCs are also being designed in Kazan, Samara and Penza.
- The Company's existing centres are expected to process up to 3,000 tonnes of various products and fully meet the needs of the Samara and Penza Regions for the sterilisation of medical devices.
- To complete the development of a line of new radiation and radionuclide therapy facilities and diagnostic equipment and launch them on the market:
- To complete the licensing of an upgraded Brachium brachytherapy facility and start mass production.
- To complete technical and clinical trials and assembly of a prototype of the ONYX radiation therapy facility. Licensing and the start of mass production are scheduled for 2022.
- To localise the production of diagnostic equipment manufactured by Elekta at ROSATOM's industrial site and start mass production.
- To complete the construction of the first production site in Russia to produce MRI devices manufactured by General Electric and prepare it for commercial operation.
- To restore logistics routes which are suitable for the transportation of radioactive isotopes and resume product shipments to a number of destinations that have been suspended due to lack of logistics infrastructure.
- To expand Mo-98 and Mo-100 supplies for projects involving alternative methods of production of Mo-99/Tc-99m to Europe and North America; to consolidate the status of the key supplier of isotopically enriched products for major research projects by fulfilling the obligations under the concluded contracts for the supply of Ge-76 and Mo-100.
- To develop new products: targeted drugs based on the 227Th and 223Ra isotopes, a drug for targeted therapy of hormone-resistant cancer based on the 213Bi isotope, innovative technology for the 13C isotope production, methods for assessing radiation exposure in patients undergoing therapy using radiopharmaceutical drugs labelled with alpha-emitting radionuclides.

Wind power

Four WPPs are under construction in the Rostov Region and the Stavropol Territory with a total capacity of 360 MW: the Marchenkovskaya WPP (120 MW), the Karmalinovskaya WPP (60 MW), the Bondarevskaya WPP (120 MW) and the Medvezhenskaya WPP (60 MW). Sites have been selected for the construction of additional WPPs with a total capacity of 500 MW in 2022 and 2023.

In 2023 and 2024, JSC NovaWind plans to commission WPP projects with a total capacity of 192.5 MW.

In the long term, the Company plans to increase renewable energy generation to 2,911.64 GWh in 2024, with local content reaching 85%.

CHAPTER 6

DIGITAL TRANSFORMATION

Key results in 2020:

- The Company is responsible for two road maps for developing high-technology areas.
- About 70 IT projects focused on internal digitisation were implemented.
- Six new digital products were launched.

6.1 Uniform Digital Strategy

ROSATOM and JSC Atomenergoprom are implementing a Uniform Digital Strategy (UDS), which is focused on supporting the digitisation of the Russian economy, developing the Company's own digital products and launching them on the market, and improving internal business processes.

The UDS covers three areas:

1) Participation in digitisation in Russia;
2) Digital products;
3) Internal digitisation.

The UDS is updated on an annual basis taking into account the results achieved by the Company and market changes.

VISION OF UNIFORM DIGITAL STRATEGY 4.0

STRATEGY

PARTICIPATION IN DIGITISATION IN RUSSIA
- Approval of the Quantum Computing Road Map
- Agreement on New Production Technologies signed with the Government

DIGITAL PRODUCTS
- Prioritisation* of external digital markets
- Digital 'facets' and new business models
- Integrated products and an integrator model

INTERNAL DIGITISATION
- Uniform Technical Policy
- Appointment of a dedicated CIO

END-TO-END DIGITAL TECHNOLOGIES AND DATA MANAGEMENT
- Navigator Digital Management System
- National Digital Industrial Platform

STRATEGIC PARTNERSHIPS AND M&A

ORGANISATIONAL CHANGE AS PART OF DIGITAL TRANSFORMATION
- Digitisation management as an industry-wide function
- Business intelligence function and methodology

DIGITAL COMPETENCES AND CULTURE

Decomposition of targets set in the UDS in digitisation** programmes of the Divisions

* Prioritisation is a tool that makes it possible to rank a diverse set of tasks in order of importance.
** Digitisation means the use of digital and computer technologies in order to redesign a business to make sure that business decision-making is fully based on data.

The UDS implementation relies on four main pillars:

- End-to-end digital technologies and data management;
- Strategic partnerships, mergers and acquisitions;
- Organisational change;
- Digital competences and a digital culture.

The launch and implementation of digitisation programmes in the Divisions is another key driver for the effective implementation of the Strategy.

In order to implement the UDS, in 2019, the Company formed the Digitisation Unit, which includes:

- The Digital Transformation Department;
- The Information Technology Departments of ROSATOM and JSC Greenatom;
- A project office tasked with creating a quantum computer in Russia;
- The Digital Economy of Russia Project Office;
- LLC JV Kvant;
- The Process Architecture Centre at JSC RPS;
- Private Institution Cifrum (a digital competence centre in the industry);
- LLC Rusatom Digital Solutions (a trading firm selling digital products and solutions).

In 2020, the Company formulated uniform principles and identified the key priorities of digitisation programmes in its Divisions aligned with the UDS priorities. An integrated system and organisational structure for digitisation management has been developed in the industry.

In 2020, the Digitisation Unit continued to take active steps to implement the Uniform Digital Strategy.

Participation in Digitisation in Russia

In 2020, the framework of government support for the development of digital technologies and products was updated as part of the Digital Technology Federal Project.

Systematic organisational, methodological and expert support provided to the Company's Divisions and nuclear organisations, as well as improved local regulations governing investment procedures have enabled an exponential increase in the amount of government co-funding secured by enterprises in the nuclear industry for digital projects.

In July 2020, the Presidium of the Government Commission on Digital Development and the Use of Information Technology to Improve the Quality of Life and the Business Environment approved a road map for developing the Quantum Computing high-technology area; ROSATOM and JSC Atomenergoprom were assigned responsibility for its implementation. A total of RUB 23.6 billion will be allocated for activities under the Quantum Computing Road Map between 2020 and 2024, with RUB 13.2 billion to be allocated from the budget.

A science and technology consortium (the National Quantum Laboratory) was established in order to implement the Road Map and to build and develop the relevant science and technology infrastructure.

In addition, in 2020:

- 10 research projects focused on technologies for the development of a quantum processor were reviewed by 14 leading international researchers from nine countries;
- The Moscow Institute of Physics and Technology (MIPT), the Moscow Engineering Physics Institute (MEPhI) and Moscow State University were actively developing specialised educational programmes;
- High-technology research equipment required for R&D activities was delivered to the Company's quantum laboratories;
- JSC Atomenergoprom established a Research and Development Committee on Quantum Technologies.

Budget funds raised by the Company, RUB billion

2018	2019	2020
0.4	1.32	6.2

The project to develop quantum computing is a major national strategic task. Findings of research conducted over the past few decades show that quantum computers can be many times more efficient that conventional computers. The Company is implementing a road map for developing quantum computing approved in 2020. The road map had been developed under letters of intent for the development of individual high-technology areas signed in July 2019 by the Government of the Russian Federation and state-owned companies. The document is focused on addressing research, engineering and infrastructure tasks related to quantum computing. The project will result in the development of a full stack of quantum computing technologies (from hardware platforms to software products and algorithms), including the development of a universal multi-qubit quantum processor.

6.3 Digital Products

In 2020, the Company officially launched six new digital products on the open market.

In June 2020, JSC Rosenergoatom unveiled the ***Infrastructure Platform for the Hosting of Modular and Containerised Data Centres***; it is a service provided by the Kalinin Data Centre. A specially equipped two-hectare site is designed to host 30 containerised customer data centres with a unit capacity of up to 1 MW.

In October 2020, JSC TVEL unveiled a new digital service, Atombot. Procurement. This is a procurement automation system enabling much more efficient processing of procurement documents. The service is based on solutions for smart business process automation; it has been successfully tested in nuclear enterprises.

In December 2020, the Company unveiled four more digital products:

- The ***Multi-D Unified Time Schedule***, a software tool for schedule management and the centralised monitoring of risks associated with complex engineering projects. This analytical solution forming part of the Multi-D technology suite does not rely on imported technology. The product has been developed and successfully adopted in the Engineering Division, where it is applied in NPP construction projects in Russia and abroad.
- ***Logos Strength***, a new component of the Logos system, which is a continually evolving computer-aided engineering (CAE) software suite. The launch of the Logos Strength module on the market marked the completion of the Company's three-year efforts to develop the key components of an engineering simulation system which does not rely on imported technology. This system also includes the Logos Aero-Hydro and Logos Thermo modules, which had been unveiled earlier. Logos provides an integrated interface for solving multiphysics problems, including calculations in the field of fluid dynamics, heat and mass transfer, static and dynamic strength and vibration resistance. Logos can fully meet the needs for physical process simulation in various industries.
- The ***Mobile Data Centre*** is a mobile data collection, processing, storage and transmission facility enabling the rapid deployment of digital infrastructure. The Mobile Data Centre is designed for use in projects requiring a rapid setup of a data reception, processing and transmission point in hard-to-reach areas. It can be used in the mining industry, including mineral exploration; in the fuel and energy sector; in construction and transportation; in the defence industry and at military facilities; in the emergency prevention and response system and in the sphere of environmental protection.
- A commercial version of the ***Pilot Access Control System*** for monitoring and managing access to public event venues and secure facilities. The system is designed to ensure the security of crowded public spaces, including not only sports venues but also the underground, airports and train stations, large office buildings, museums and exhibition halls, municipal parks and recreation areas. Its distinguishing feature is that the system makes it possible to integrate equipment at geographically dispersed facilities into a single access control system and is capable of supporting about a million users in real time. The system has been developed by NIKIRET.

In 2020, JSC Atomenergoprom's register of digital products included more than 100 products developed by 30 enterprises in the industry. To facilitate the development of successful market solutions based on digital products, in 2020, a Digital Product Development Club was launched in the industry.

6.4 Internal Digitisation

As part of internal digitisation programmes, in 2020, the Company implemented about 70 IT projects of different scale and level of complexity.

The Company is developing an integrated digital platform; in the future, this platform will combine the ecosystems of enterprises, suppliers of goods and services both within and outside the industry, Russian government agencies and international organisations. In addition, industry-specific processes are being increasingly integrated into the public service infrastructure: individual functions are performed within the Company, which involves communication with the government to obtain information needed by both employees and the employer.

A deteriorating epidemiological situation posed a major challenge for the Company's IT function in 2020. To enable uninterrupted remote work and efficient communication between employees, remote access to corporate resources was provided for more than 40,000 workstations. A corporate communication platform was launched in the industry; it comprises a messaging service and a platform for online events. By year end, the number of its users reached 14,000 people, and the project was recognised as the best mobile communication solution according to Global CIO.

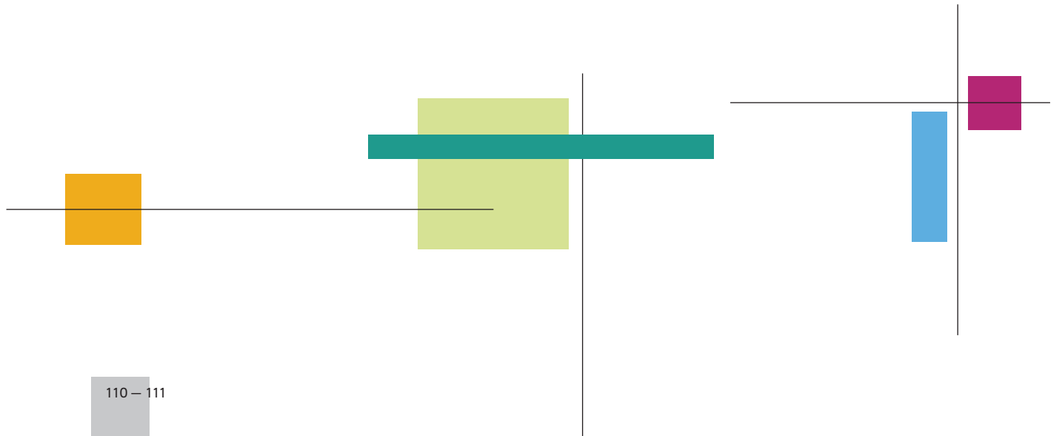
In 2020, the IT landscape was being developed ahead of schedule. A Private LTE network was tested simultaneously at three production sites; it enables nuclear enterprises to introduce state-of-the-art digital services fully compliant with all security requirements.

Projects in the sphere of electronic document management were also a breakthrough. About 10,500 employees were given access to a cloud service system for managing legally valid documents. A data mart for tax monitoring launched jointly with the Federal Tax Service enabled nuclear enterprises to shift to a new format of operation.

Corporate import substitution processes in the sphere of IT are entering a new phase: in 2020, the Company started to take practical steps to transition its employees to workstations that do not rely on imported technology. A project was launched to migrate the integrated industry-wide document management system (IIDMS) to a domestically developed platform. A competitive tendering process was announced for the procurement of a domestically developed operation system and office software. The pilot scope of the corporate cloud was migrated to Russian software; the Company also piloted the migration of data backup tools to domestically developed solutions. In terms of methodological guidelines, the Company developed three corporate action plans for import substitution and is currently testing Russian software. Nine of the Company's import substitution initiatives are being reviewed at the federal level.

As part of the programme to digitise NPP construction processes, the Company developed design solutions for multiplatform computer-aided design systems. The design and procurement functions were integrated within ASE (this was piloted at Kursk NPP-2); the Company also piloted an integrated database on the cost of resources for NPP construction.

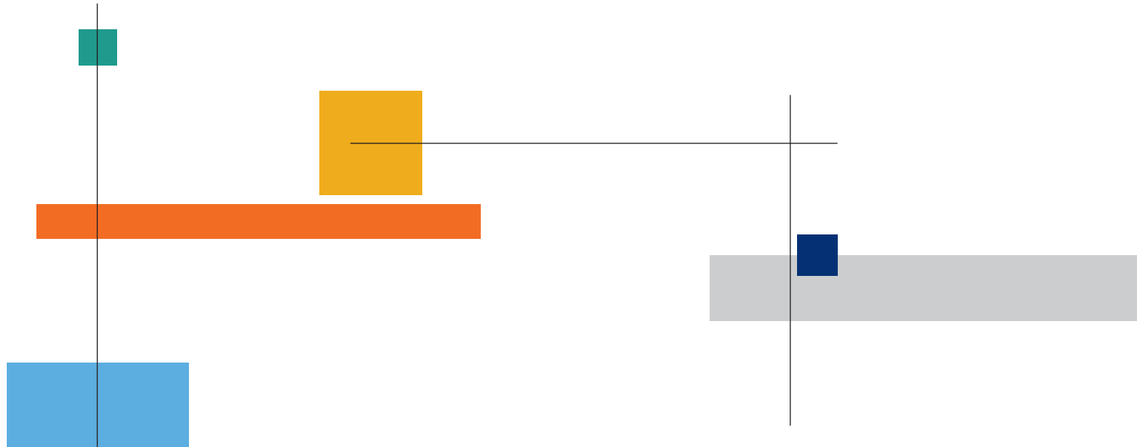
The Company piloted product releases of document management modules forming part of the Multi-D suite: Electronic Technical Document Management and Executive Documentation, as well as an integrated network scheduling system. The TCM NC system became fully operational at the construction sites of Paks II, Rooppur and El Dabaa NPPs. Draft standards and other regulations in the sphere of information modelling were prepared and submitted to the technical committees of the Russian Ministry of Construction, Housing and Utilities for approval.



6.5 Plans for 2021

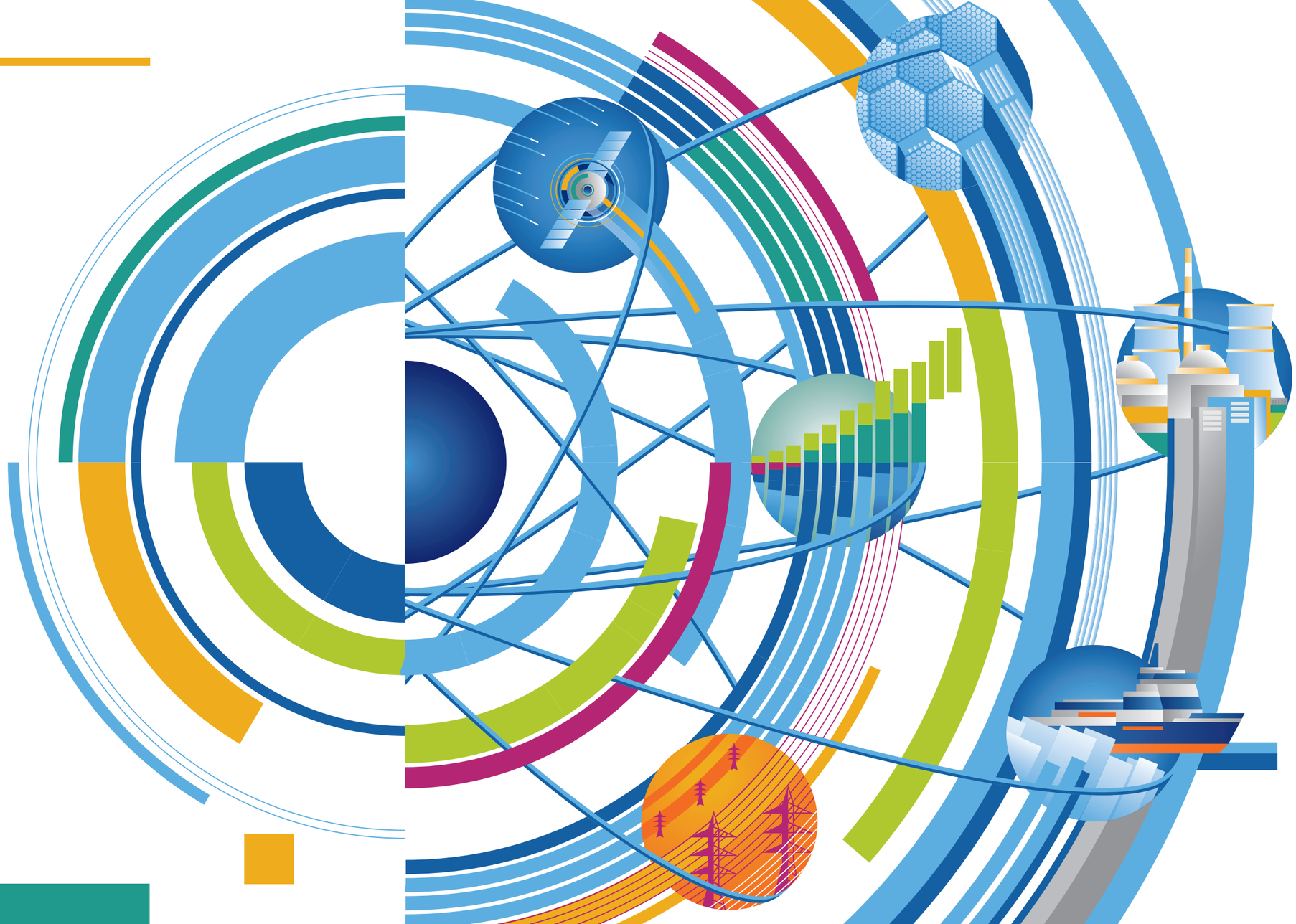
In 2021, the Company plans to:

- Develop digital products aligned with global best practices to meet the needs of the industry;
- Form product teams that will be responsible for digital product development and help them to further develop their professional competences;
- Productise the best digital projects and initiate their implementation in the industry;
- Effectively fulfil the obligations of ROSATOM and JSC Atomenergoprom as competence centres/participants of the Digital Technology Federal Project forming part of the Digital Economy National Programme; contribute to the development and implementation of digital transformation strategies for various sectors of the Russian economy;
- Secure government co-funding for digital projects to be implemented by enterprises in the industry, including quantum computing (over RUB 5 billion);
- Implement all measures scheduled for 2021 under the road map for developing the Quantum Computing high-technology area, pursuant to Decree No. 1875 of the Government of the Russian Federation dated 18 November 2020;
- Approve a road map for developing the New Production Technologies high-technology area; establish a Competence Centre responsible for developing New Production Technologies and initiate the implementation of the road map.



CHAPTER 7

GOVERNANCE SYSTEM



7.1 Corporate Governance

Objectives, principles and mechanisms of corporate governance

JSC Atomenergoprom exercises its shareholder powers with regard to organisations in the nuclear industry in accordance with the applicable Russian corporate legislation in order to ensure that corporate procedures established in JSC Atomenergoprom are followed in a timely manner and to the required standard. Since ROSATOM holds 100% of voting shares in JSC Atomenergoprom, the shareholder's decisions with regard to organisations in the Russian nuclear power sector are aligned with ROSATOM's position.

JSC Atomenergoprom's actions with regard to organisations in the nuclear industry are aimed at improving their performance in order to help to achieve the strategic goal of ROSATOM, namely to ensure the security and competitiveness of the Russian Federation.

Principles of corporate governance:

- Standardisation of governance in the organisations in the Russian nuclear power sector, organisations of various legal forms specialising in nuclear and radiation safety, nuclear science and technology and personnel training, with due regard to the special characteristics of each enterprise and organisation;
- Removing non-operating and inactive companies from the nuclear industry and eliminating redundant corporate ownership levels;
- Avoiding excessive expansion of the area of competence of corporate governance bodies of nuclear organisations and transferring a number of optional issues to the level of cooperation between them based on regulatory documents adopted in the industry with regard to various groups of business processes;
- A division-based management model within the civilian part of the nuclear industry, which involves creating core business divisions of ROSATOM (e.g. the Mining, Fuel, Mechanical Engineering, Power Engineering and Engineering Divisions), as well as a number of business incubators and functional industry organisations whose holding companies own/manage various organisations in the nuclear industry, depending on their areas of business.

Mechanisms of corporate governance:

- Corporate governance activities: currently, ROSATOM directly or indirectly (through its subsidiary, JSC Atomenergoprom) exercises the powers of an asset owner or a shareholder/member with regard to nuclear organisations, as stipulated by applicable legislation of the Russian Federation;
- Operational control through additional coordination of certain areas of operations of the said organisations based on the procedures for cooperation signed by ROSATOM and holding companies of its business divisions, business incubators and functional industry organisations.

Governing bodies

GRI 102-18
GRI 102-22

Board of Directors of JSC Atomenergoprom

Members of JSC Atomenergoprom's Board of Directors during the period from 1 January 2020 through 31 December 2020 (elected on 28 June 2019, with the same members re-elected on 29 June 2020):

1. Kirill Komarov

2. Ekaterina Lyakhova, Chair of the Board of Directors

3. Anna Miroshnichenko

4. Ilya Rebrov

5. Vladislav Korogodin

Information on the members of the Board of Directors

Kirill Komarov
Date of birth: 1973.
Place of birth: Leningrad (Saint Petersburg).
Education: university degree.
Positions held over the past five years.
2010 – present – Executive Director of the Directorate for the Nuclear Power Complex, ROSATOM; Deputy Director General, Director for Corporate Development and International Business; First Deputy Director General, Director for Corporate Development and International Business, ROSATOM. He simultaneously holds the position of Director of JSC Atomenergoprom.
He does not own the Company's shares.

Ekaterina Lyakhova
Date of birth: 1975.
Place of birth: Sverdlovsk (Ekaterinburg).
Education: university degree.
Positions held over the past five years.
2011 – present – Deputy Director of JSC Atomenergoprom; Director for Investment Management and Operational Efficiency, Director for Economics and Investments, Head of Business Development, ROSATOM.
She does not own the Company's shares.

40% of members of the Board of Directors are women

Anna Miroshnichenko
Date of birth: 1978.
Place of birth: Murmansk.
Education: university degree.
Positions held over the past five years.
2010 – present – leading specialist; adviser in the Division of Corporate Engagement with Joint-Stock Companies, Federal State Unitary Enterprises and Federal Government Agencies, Department for Legal Issues and Corporate Governance; 2014 – present – Corporate Secretary of JSC Atomenergoprom.
She does not own the Company's shares.

Ilya Rebrov
Date of birth: 1976.
Place of birth: Leningrad (Saint Petersburg).
Education: university degree.
Positions held over the past five years.
2010 – present – Director of the Economics and Financial Controlling Department; Economics and Finance Director, Deputy Director General for Economics and Finance, ROSATOM.
He does not own the Company's shares.

Vladislav Korogodin
Date of birth: 1969.
Place of birth: Moscow.
Education: university degree.
Positions held over the past five years.
2010 – present – Deputy Director of the Directorate for the Nuclear Power Complex; Director for NFC and NPP Life Cycle Management, ROSATOM.
He does not own the Company's shares.

Director of JSC Atomenergoprom

Kirill Komarov was appointed as Director of JSC Atomenergoprom as from 14 April 2020 (minutes of the meeting of JSC Atomenergoprom's Board of Directors No. 481 dated 13 April 2020).

Report of the Board of Directors

GRI 102-34

In 2020, the Board of Directors held 36 meetings by absentee voting. At its meetings, the Board of Directors adopted resolutions on key issues related to the operations of JSC Atomenergoprom, including the following:

- A meeting of the Board of Directors was held prior to the Annual General Meeting of Shareholders of JSC Atomenergoprom;
- In February 2020, the Bank of Russia registered amendments to the resolutions on additional issues of ordinary and preferred shares of JSC Atomenergoprom and the accompanying prospectus (reflecting an extension of the share placement period), which are aimed at raising funds for projects in the nuclear industry;
- A number of decisions were taken to improve the structure of JSC Atomenergoprom's group of companies *(see the section 'Key Changes in the Corporate Structure in 2020').*

Resolutions of the sole shareholder

In 2020, the shareholder owning 100% of voting shares adopted four resolutions:

- Profit distribution for 2019;
- Election of the Board of Directors;
- Dividends for the first half of 2020 and for the nine months of 2020.

Payment of declared (accrued) dividends on JSC Atomenergoprom's shares

Under the resolution of ROSATOM as the holder of 100% of voting shares in JSC Atomenergoprom, in January and February 2020, dividends were paid out for the nine months of 2019 totalling RUB 4,997 million, including dividends on book-entry registered ordinary shares held by ROSATOM totalling RUB 4,720 million and dividends on book-entry registered preferred shares held by the Russian Ministry of Finance representing the Russian Federation totalling RUB 277 million.

Under the resolution of ROSATOM as the holder of 100% of voting shares in JSC Atomenergoprom, in June 2020, dividends for 2019 were declared and paid within the prescribed time frame; the dividends totalled RUB 2,608 million, including RUB 2,463 million on ordinary shares and RUB 145 million on preferred shares.

Under the resolution of ROSATOM as the holder of 100% of voting shares in JSC Atomenergoprom, in the third quarter of 2020, interim dividends for the first half of 2020 were declared and paid within the prescribed time frame; the dividends totalled RUB 13,552 million, including RUB 12,800 million on ordinary shares and RUB 752 million on preferred shares.

Under the resolution of ROSATOM as the holder of 100% of voting shares in JSC Atomenergoprom, in the fourth quarter of 2020, interim dividends for the nine months of 2020 were declared and paid within the prescribed time frame; the dividends totalled RUB 9,104 million, including RUB 8,600 million on ordinary shares and RUB 504 million on preferred shares.

Major transactions and non-arm's length transactions

Major transactions

In 2020, JSC Atomenergoprom did not conclude any major transactions.

Non-arm's length transactions

In accordance with paragraph 17.1 of the Charter of JSC Atomenergoprom, the provisions of Chapter 11 of the Federal Law on Joint-Stock Companies do not apply to the Company.

Key changes in the corporate structure in 2020

GRI 102-10

1. As part of the development of its regional network, the Company created a subsidiary of Rusatom International Network in Hungary (Rosatom Hungary Kft), which performs the functions of ROSATOM's regional centre in Eastern Europe.
2. In order to develop a new business in the sphere of industrial and consumer waste management, the Company completed the transformation of LLC Rusatom Greenway into a joint-stock company.
3. A joint venture was formed in order to establish a certification centre that will be responsible for verifying product compliance with fire safety requirements.
4. In order to build a multipurpose irradiation centre in the Republic of Uzbekistan, JSC Rusatom Healthcare established LUCH SIRIUS (Republic of Uzbekistan), a joint venture incorporated as a limited liability company.
5. In order to consolidate the Company's position and promote long-term development on the Hungarian market, JSC Rusatom Service and MVM Hungarian Electricity Plc. concluded a deal to establish a joint venture in Hungary, European Power Services Zrt.
6. In order to develop the capabilities of JSC Rusatom Service in the sphere of design and production of full-scale simulators and analytical packages, the Company acquired a 100% shareholding in JSC ETC GET.
7. In order to implement a joint project, JSC Rusatom Healthcare established LLC Radiological Medical Technologies, a joint venture providing external beam radiation therapy services.
8. In order to implement an ash and slag processing project, JSC Rusatom Infrastructure Solutions established a wholly owned subsidiary, LLC Tefra (Seversk, Tomsk Region).

9. JSC RPC Khimpromengineering acquired a 100% shareholding in LLC Porcher Advanced Materials (a manufacturer of high-technology textile based on carbon fibre).
10. The entire shareholding in JSC Isotope (100%) previously owned by ROSATOM was transferred to JSC Rusatom Healthcare.
11. Shares in PJSC MSZ were bought back from minority shareholders.
12. The Bank of Russia registered changes in the additional issues of ordinary and preferred shares of JSC Atomenergoprom and the accompanying prospectus (with the share placement period extended by one year); this measure is intended to facilitate fundraising for projects in the nuclear industry.

JSC Atomenergoprom's compliance with the principles and recommendations of the Corporate Governance Code recommended by the Bank of Russia

JSC Atomenergoprom adheres to the key corporate governance principles stipulated by Russian legislation and the Corporate Governance Code (e.g. respect for shareholder rights, the procedure, format and scope of information disclosure), with some exceptions stemming from the nature of the business and the legal status of JSC Atomenergoprom and its organisations (restricted civil circulation of shares of joint-stock companies appearing on the lists approved by the Russian President and comprising legal entities that may be holding nuclear materials or nuclear facilities).

Key provisions of JSC Atomenergoprom's policy on remuneration and/or reimbursement of expenses; information on remuneration and/or reimbursement of expenses

GRI 102-36

No decisions were taken in 2020 to pay out remuneration and/or reimburse expenses incurred by the members of JSC Atomenergoprom's Board of Directors; no remuneration or reimbursement for expenses were paid out.

Board members who are full-time employees of the Company/ROSATOM are remunerated for their work in accordance with the Standardised Industry-Wide Remuneration System instituted by ROSATOM. Remuneration, including salary, is paid to Board members in accordance with employment contracts and applicable local regulations of the Company/ROSATOM on remuneration[33].

7.2 Risk Management

Risk management system

GRI 103-1
GRI 103-2

The industry-wide risk management system (RMS) is integrated into the Company's planning and management processes. The RMS is based on a continuous cyclical process of identifying, assessing and managing the risks that can affect JSC Atomenergoprom's short- and long-term performance and the implementation of its strategy.

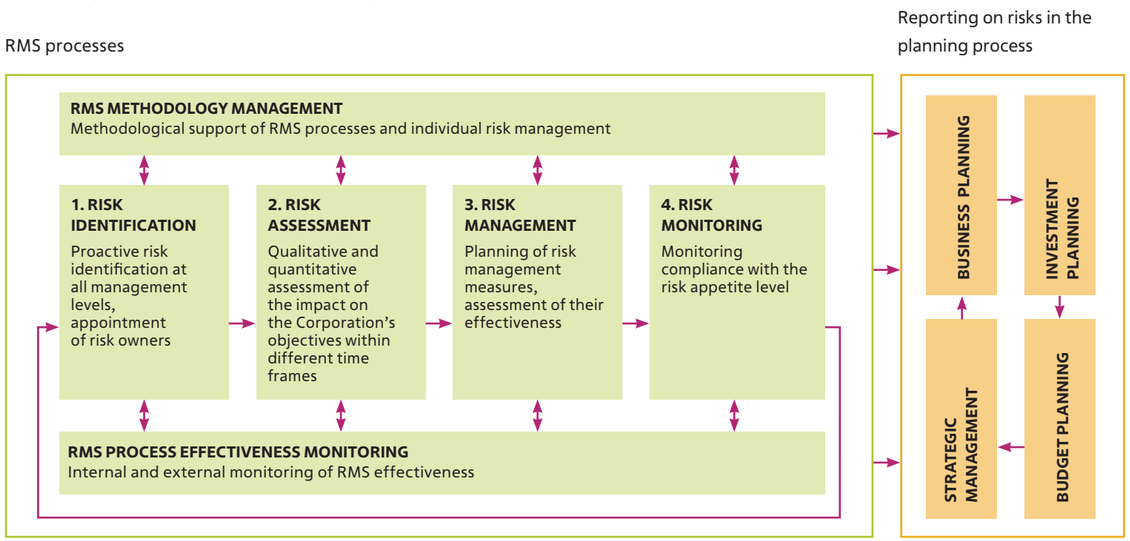
The RMS is being developed in accordance with the approved Risk Management Development Programme for the period from 2019 through 2024.

[33] Details on income, expenses, assets and liabilities of JSC Atomenergoprom's Board members who are the Company's full-time employees are available on the website at: http://www.rosatom.ru/about/protivodeystvie-korruptsii/svedeniya-o-doxodax-rabotnicov.

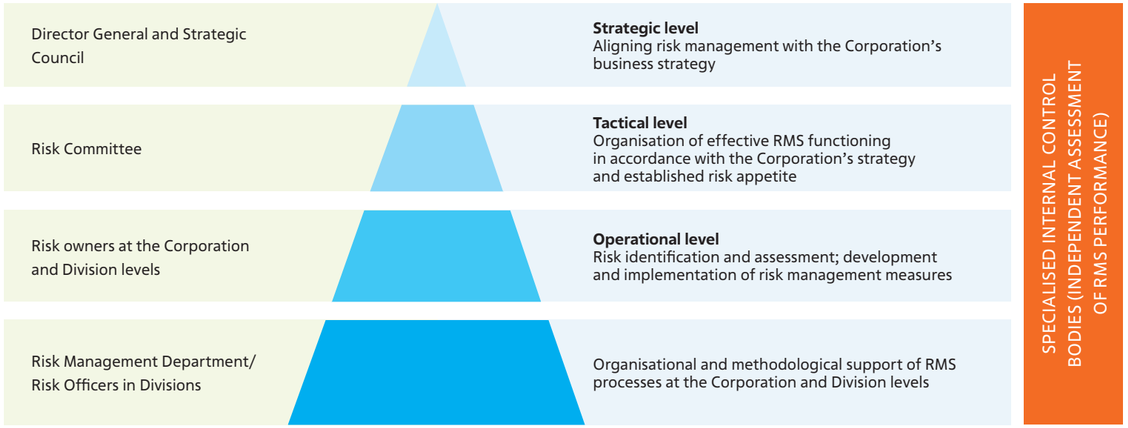
In 2020:

- Approaches to risk monitoring and the prevention of risk recurrence were developed: a database of the relevant indicative external and internal case studies and NPP construction benchmarks (systemic risks) was created; an expert assessment of the impact of systemic risks on project cost, time frame and likelihood of abandonment was carried out;
- A risk reporting format was developed for the Company's Analytical Centre; data on changes in key indicators reflecting the level of critical risks, including those posed by the COVID-19 pandemic, are updated on a quarterly basis;
- An expert assessment of key risk indicators was carried out, and data on changes in their levels were collected; a list of key risk indicators was compiled, including a description, sources of information, the calculation algorithm and frequency, and thresholds (warning and response thresholds);
- Performance of the risk management system for federal (national) projects was assessed as part of budget performance assessment;
- The Company started to develop and implement an industry-wide IT system for risk management (ISRM): functional specifications were drafted setting out requirements for the scope of work and deliverables in terms of developing and implementing the IT system; the technical architecture and the sequence of implementation of the relevant subsystems were determined.

Risk management process at JSC Atomenergoprom



Organisational model of the risk management system



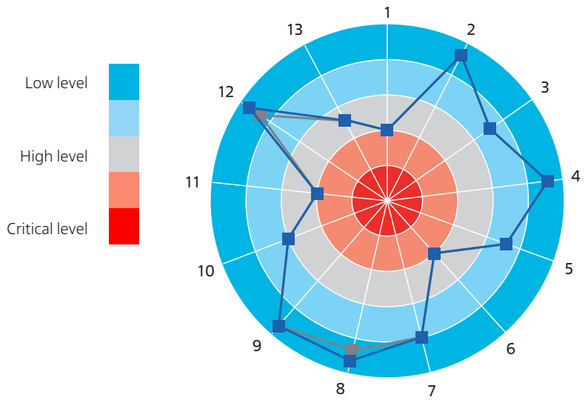
Key business risks[34]

As part of the functioning of the RMS, a list of critical risks was compiled; risk owners were appointed; risks were assessed, and risk management measures were developed and implemented.

Comprehensive risk management measures largely offset the negative impact of external factors on the implementation of JSC Atomenergoprom's strategy.

[34] The annual report does not contain an exhaustive description of all risks that may affect the Company's operations; it only provides information on key risks.

Risk radar



1. Currency risk
2. Interest rate risk
3. Credit risk
4. Liquidity risk
5. Nuclear fuel cycle product and service market risk
6. Electricity and capacity market risk
7. Risk of a decrease in power generation
8. Health, safety and environmental risks
9. Risk of loss of and damage to assets
10. Reputational risk
11. Project risks
12. Climate change risks
13. Social and political risks

2020 risk assessment
2021 risk assessment

GRI 103-3

Risk management outcomes in 2020

Change in estimated risk levels for 2021:

↗ increase ↘ decrease ○ no significant changes

The Company's strategic goals:

1. To increase the international market share
2. To reduce production costs and the lead time
3. To develop new products for the Russian and international markets
4. To achieve global leadership in state-of-the-art technology

Risks and changes in risk levels (risk owners)	Risk description	Risk management practices	Connection with strategic goals
Financial risks			
1. Currency risk ○ (Executives of the Company's Divisions)	Adverse changes in exchange rates	**Management approaches:** ■ Setting the highest possible conversion rates when negotiating the terms of expense contracts; ■ Monitoring the terms of foreign currency payments under revenue contracts and expense contracts concluded as part of performance of revenue contracts; ■ Maintaining a balance of claims and liabilities denominated in foreign currencies (natural hedging); ■ Use of financial hedging instruments. **Results:** Foreign currency liabilities were met without raising additional funds to compensate for exchange rate fluctuations. Divergent trends in the exchange rates of currencies in which project financing, key items of capital expenditure and operating cash flows are denominated were taken into account. An optimal ratio of assets and liabilities denominated in the same currency was maintained. **Changes:** There were no significant changes.	1 2 3
2. Interest rate risk ○ (ROSATOM's Treasury Department)	Adverse changes in interest rates, different timing of interest income and interest expenses	**Management approaches:** ■ Maintaining a balance of interest income and interest expenses in terms of timing and amounts; ■ Reasonable selection of interest rates (fixed or floating) for the expected maturity period. All things being equal, the Company prefers long-term fixed-rate loans with the option of penalty-free early repayment; ■ Floating-rate loans on which interest rates may be increased are refinanced using the intra-group liquidity pool. **Results:** The Company maintains a stable long-term credit portfolio. The risk level decreased in 2020 due to the effective use of the risk management approaches described above, subsidies, as well as a decrease in the key rate of the Bank of Russia and lower volatility on the Russian credit market. **Changes:** The likelihood of an increase in the risk level due to an interest rate hike is assessed as low. *For details, see the section 'Financial Management'.*	1 2 3

Risks and changes in risk levels (risk owners)	Risk description	Risk management practices	Connection with strategic goals
3. Credit risk ○ (ROSATOM's Treasury Department for banks; executives of the Company's organisations for other counterparties)	Failure by counterparties to fulfil their obligations in full and on time	**Management approaches:** ■ Setting and monitoring limits for counterparty banks; ■ Using suretyship, guarantees, restrictions on advance payments in favour of external counterparties; ■ Improving the legal framework for the wholesale electricity and capacity market (including increasing fines and improving the system of financial guarantees); ■ Monitoring the status of accounts receivable and the financial position of counterparties; ■ An internal counterparty solvency rating system. **Results:** Losses through the fault of counterparties were minimised.	1 2
4. Liquidity risk ○ (ROSATOM's Treasury Department / Heads of Divisions)	Lack of funds for the fulfilment of obligations by the Company and its organisations	**Management approaches:** ■ Centralised cash management (cash pooling); ■ Rolling liquidity forecasts and cash flow budget; ■ Maintaining required amounts of open lines of credit with banks; ■ Reducing the period of keeping spare cash on bank deposits when this is advisable from an economic perspective; ■ Discussing matters related to state support with Russian federal executive authorities; ■ Active use of project financing instruments as part of implementation of projects and programmes by the Company and its organisations (for details, see the section 'Financial Management'); ■ Maintaining credit ratings assigned to JSC Atomenergoprom by the 'Big Three' international rating agencies (S&P, Moody's and Fitch) and by JSC Expert RA. **Results:** The Company maintained sufficient liquidity to repay liabilities on time, preventing unacceptable losses and reputational risk. *For details, see the section 'Financial Management'.*	1 3

Risks and changes in risk levels (risk owners)	Risk description	Risk management practices	Connection with strategic goals
Commercial risks			
5. Nuclear fuel cycle (NFC) product and service market risk ○ (Executives of the relevant Divisions of the Company)	Adverse change in the pricing environment and demand on markets for natural uranium and uranium conversion and enrichment services	**Management approaches:** ■ Maintaining an optimal balance between market-focused and escalation pricing mechanisms (based on benchmark price inflation) in contracts; ■ Aligning pricing mechanisms used for procurement and those used in contracts with a high level of commodity risk; ■ Discussing the volume of future orders with customers in advance; ■ Embedding quantitative flexibility and options in contracts with suppliers to align purchase and sales volumes; ■ Providing supply guarantee mechanisms; ■ Improving the technical and economic characteristics of nuclear fuel; developing new types of fuel; ■ Promoting products in new market segments. **Results:** A transition to the fixed selling price for uranium in the Company enabled it to concentrate the risk of changes in uranium prices in processing enterprises. The risk level remains unchanged. *For details, see the section 'International Business'.*	1 2 4
6. Electricity and capacity market risks ○ (Director General of JSC Rosenergoatom)	Adverse changes in electricity and capacity prices	**Management approaches:** The risk depends exclusively on external factors. The risk cannot be hedged using financial instruments due to the low liquidity of the market. To reduce the risk, power supply divisions of JSC Rosenergoatom are negotiating with PJSC FGC UES and JSC SO UEC in order to align the schedule of power grid equipment maintenance. **Results**: In 2020, like in previous periods, key drivers included electricity consumption in the first pricing zone, indexation of gas prices (with gas being the main type of fuel used by thermal power plants in the first pricing zone) and competition between power generation companies. Due to a significant fall in consumption as a result of restrictions imposed in response to the new coronavirus disease, in 2020, the impact of these factors on electricity and capacity prices was much more pronounced than in 2019. Indeed, in 2020, electricity consumption in the first pricing zone decreased by 5% year on year.	1

Risks and changes in risk levels (risk owners)	Risk description	Risk management practices	Connection with strategic goals
Operational risks			
7. Risk of a decrease in power generation ○ (Director General of JSC Rosenergoatom)	Decrease in power generation due to equipment shutdowns and unavailability	**Management approaches:** ■ Scheduled preventive maintenance and repairs at NPPs; ■ Implementation of the NPP life extension programme and equipment upgrades to increase installed capacity and power generation at operating power units (including the possibility of power units operating at above nameplate capacity); ■ To minimise the impact of restrictions imposed by the system operator on nuclear power generation in 2020 amid the lockdown aimed at preventing the spread of COVID-19, daily regulation was introduced at Kola, Novovoronezh, Balakovo, Rostov and Kalinin NPPs. **Results:** All incidents and equipment failures have been properly investigated. Corrective and preventive measures have been developed in order to address the root causes of the incidents and prevent their recurrence. **Changes:** Implementation of a set of risk management measures and the use of tools forming part of the ROSATOM Production System has made it possible to offset the impact of negative factors.	1
8. Health, safety and environmental (HSE) risks ↘ (Executives of the Company's Divisions)	Major accidents/ incidents in nuclear enterprises	**Management approaches:** ■ Comprehensive inspections in manufacturing enterprises, followed by the development and implementation of risk mitigation plans; ■ Measures to improve HSE performance in the enterprises, including measures to enhance occupational safety, reduce the impact of the Company's operations on the health of the local population and prevent irreversible changes in the natural environment in the towns and cities hosting nuclear power and nuclear industry enterprises; ■ Measures to upgrade process equipment and improve production processes in the enterprises; ■ Monitoring of compliance of operations with statutory limits on environmental and health impacts; ■ Monitoring of individual radiation risk exposure of employees and measures to reduce it; ■ Monitoring of the radiation level and the environmental situation in ROSATOM's regions of operation;	4

Risks and changes in risk levels (risk owners)	Risk description	Risk management practices	Connection with strategic goals
		■ Constant readiness of emergency response teams and equipment; ■ Special reserve funds formed by ROSATOM to ensure safety at all stages of the life cycle of its production facilities; ■ Arranging civil liability insurance against damage resulting from accidents for enterprises that own hazardous industrial facilities; ■ Calculation and monitoring of indicators used for assessing the probability of potential negative implications of industrial safety violations at hazard class 1 and 2 industrial facilities; ■ Timely updates to internal regulations of the organisations, as required by the legislation and federal rules and standards; ■ Safe operation of hazardous industrial facilities of ROSATOM's organisations; ■ Maintaining a high level of professionalism, accountability and safety culture among employees; ■ Continuous monitoring of the use of personal protective equipment (including equipment designed to prevent the spread of COVID-19) by employees in the workplace **Results:** Safe operation of ROSATOM's organisations, including hazardous industrial facilities. The risk level decreased	
9. Risk of loss of and damage to assets ○ (Asset Protection Department of ROSATOM)	Corruption and other offences leading to a damage to/loss of assets	**Management approaches:** An integrated industry-wide system for the prevention of corruption and other offences is in place in the Russian nuclear industry. **Results:** In accordance with ROSATOM's Anti-Corruption Plan for the period from 2018 through 2020, the Company implemented anti-corruption measures stipulated in the National Anti-Corruption Plan for the relevant period approved pursuant to Decree No. 378 of the President of the Russian Federation dated 29 June 2018. The Company continued to develop the legal and organisational anti-corruption framework and to ensure compliance with anti-corruption laws and managerial decisions.	1 2

Risks and changes in risk levels (risk owners)	Risk description	Risk management practices	Connection with strategic goals
		Systematic measures were taken to prevent and resolve conflicts of interest. Executives of new businesses established in the nuclear industry were informed about prioritised anti-corruption measures, including the industry-wide anti-corruption regulations to be implemented in the organisations.	
10. Reputational risk ○ (Communications Department of ROSATOM and Heads of Divisions)	Changes in stakeholder perception of the trustworthiness and appeal of the Company and its organisations	**Management approaches:** ■ Measures are taken to shape a positive public opinion on the development of the Company's technologies (both nuclear and non-nuclear) through improved information transparency and open stakeholder engagement (including the functioning of an industry-wide public reporting system); ■ The Company works continuously to improve the recognition and appeal of its HR brand (both in the industry and among prospective employees and within the expert community); ■ The Company continuously monitors public opinion on NPP construction and information on the decisions of government and regulatory bodies on curtailment of nuclear power generation in the countries where the Company is implementing projects. It continuously monitors and analyses news reports in the national and international media and information obtained during business meetings, industry conferences and workshops. Industry executives are promptly informed about key developments in the media space in Russia and abroad; ■ Technical tours and media tours of Russian nuclear facilities are arranged for foreign media representatives; ■ The Company maintains a presence on social media; ■ JSC Atomenergoprom's representatives participate in international industry exhibitions as speakers/ delegates; ■ The Company publishes printed materials (brochures, leaflets) to raise public awareness about the nuclear power industry.	1 3

Risks and changes in risk levels (risk owners)	Risk description	Risk management practices	Connection with strategic goals
		Results: Overseas projects are supported by government bodies. In 2020, the Company successfully held a number of events marking the 75th anniversary of the Russian nuclear industry; these events served to enhance the credibility of nuclear technologies and ROSATOM's projects among the general public in Russia and abroad. According to the findings of opinion polls, in 2020, 61.1% of the Russian population supported the use of nuclear power. Over the past few years, this figure remains persistently high. According to data in the Medialogia automated media monitoring and analysis system, in 2020, 95.98% of publications about the Russian nuclear industry were positive or neutral. **Changes:** There was no significant increase in the level of reputational risk in 2020. Strong correlation with political risk, which tended to increase, was largely offset by successful communication campaigns centred around the programme of events marking the 75th anniversary of the Russian nuclear industry, as well as the coverage of ROSATOM's major achievements in Russia and abroad. *For details, see the sections 'Stakeholder Engagement' and 'Personnel Management'.*	
11. Project risk ○ (Executives of the Company's Divisions)	Changes in the macroeconomic indicators of countries participating in the projects; contractors' failure to fulfil their commitments with regard to the schedule and quality of work to be performed	**Management approaches:** ■ Improving project management practices; ■ Developing action plans for the interaction with foreign customers; ■ Concluding long-term contracts stipulating fixed electricity prices; ■ Developing standardised design solutions; ■ Implementing a programme to reduce the cost and duration of NPP construction; ■ Implementing measures forming part of the industry-wide approach to managing risks associated with NPP construction projects; ■ Reallocating available credit resources between projects, when possible; ■ Developing additive manufacturing, including a system of printing services and infrastructure for new digital production facilities.	1 3 4

Risks and changes in risk levels (risk owners)	Risk description	Risk management practices	Connection with strategic goals
		Results: The Company continuously improves the system for managing all stages of NPP construction, from front-end engineering design to the commissioning of power units. The Company carries out quantitative risk assessment for NPP construction projects (using the Monte Carlo method). A standardised approach to risk identification and assessment was developed and piloted. Risk assessment was carried out using the CAPEX@RISK model. Risk identification and assessment tools tested as part of NPP projects were piloted as part of a project run by JSC TVEL. Project risk management templates were developed. Risks related to a pilot project were identified, systematised and assessed (jointly with JSC TVEL).	
12.Climate risk ↘ (Executives of the Company's Divisions)	Adverse climate change/impacts of natural disasters on the operations of the Company and its organisations	**Management approaches:** ■ At the stage of NPP design, JSC Atomenergoprom carries out a comprehensive assessment of risks associated with the climatic characteristics of the region where the proposed NPP construction site is situated; ■ Calculations performed as part of an assessment of external impacts take into account the climatic characteristics of the customer country and form part of a probabilistic safety assessment; ■ Industrial environmental control is performed to ensure that the operations of enterprises that make an impact on the environment comply with statutory limits and applicable environmental laws and regulations; ■ Measures are developed and implemented in order to reduce greenhouse gas emissions from production operations; ■ The Company is developing wind power generation in order to increase the share of zero-carbon energy in the country's energy mix; ■ The environmental impact of NPPs is monitored at each stage of their life cycle (design, construction, operation and decommissioning). Special comprehensive measures forming part of a Comprehensive Plan for the Implementation of the Environmental Policy of ROSATOM and Its Organisations, which is updated on an annual basis, are implemented at NPPs. These measures help to predict and prevent emissions, accidents and their development and to minimise their impact.	1 4

Risks and changes in risk levels (risk owners)	Risk description	Risk management practices	Connection with strategic goals
		Results: Following the completion of engineering surveys, appropriate design solutions are adopted for each NPP construction project taking into account the climatic characteristics of the region where the NPP will be built. ROSATOM makes sure that all its operations are environmentally safe; nuclear power generation facilities produce virtually no CO or CO_2 emissions, helping to maintain the natural ecological balance and reduce the likelihood of adverse climate changes or natural anomalies. In 2020, the first wind farm was put into operation in the south if Russia; it comprises the 150 MW Adygea Wind Power Plant (WPP) and the 210 MW Kochubeyevskaya WPP situated in the Stavropol Territory and operated by JSC NovaWind (an organisation of ROSATOM).	
13. Social and political risks in the regions of operation, including the risk of a deterioration in the epidemiological situation ○ (ROSATOM and executives of the Company's Divisions)	Loss of public approval for the location of infrastructure facilities. Deteriorating epidemiological situation.	**Management approaches:** JSC Atomenergoprom operates in a socially important sector of the economy. The Government of the Russian Federation makes a direct impact on JSC Atomenergoprom's operations by financing individual federal projects and federal target programmes. As a result, JSC Atomenergoprom and its organisations are characterised by a high level of financial resilience sufficient to withstand the negative economic consequences of social and regional risks. The Company implements a set of measures (public consultations, engagement with non-governmental organisations and the media) to inform the general public that its operations do not pose environmental risks. Simultaneously, the Company conducts environmental upgrades in the back-end segment, introducing new RAW and SNF processing technologies and reducing the volume and radioactivity of waste.	

Risks and changes in risk levels (risk owners)	Risk description	Risk management practices	Connection with strategic goals
		To prevent a deterioration in the epidemiological situation, the Company fully complies with all requirements for public sanitation and disease prevention amid the spread of the new coronavirus disease (COVID-19) and recommendations by the Federal Service for Surveillance on Consumer Rights Protection and Human Wellbeing (Rospotrebnadzor); in addition, the following measures were implemented:: ■ A Crisis Centre was established to prevent the spread of COVID-19; ■ During non-working days, teams were formed in enterprises in Moscow to ensure the continuity of core processes in the workplace with a minimal risk to employees; manufacturing enterprises in the regions continued to operate, but measures were taken to protect employees against COVID-19; ■ Employees working remotely were provided with computers; ■ Physical contact among employees in the workplace was minimised; ■ Temperature checks were arranged at the entrance to the premises of the enterprises; ■ COVID and antibody testing of employees was arranged; ■ Employees were provided with means of protection (face masks, gloves, hand sanitisers). **Results:** The set of measures implemented by the Company to prevent the spread of COVID-19 helped to minimise the number of infected employees. Despite a challenging epidemiological situation, the atmosphere in the Company's host towns and cities remained calm, and the Company successfully ensured operational continuity in its enterprises. **Forecast changes:** The risk level is not expected to increase in 2021. The risk level is expected to remain low, including due to measures preventing the spread of the virus.	

Other risks

Licensing risks. JSC Atomenergoprom currently has all necessary licences. Where necessary, JSC Atomenergoprom can promptly obtain licences for new businesses and renew existing licences.

Logistical risks. Regions in which the core operations of JSC Atomenergoprom and its organisations are situated have well-developed infrastructure and transport links. JSC Atomenergoprom's organisations implement preventive measures to ensure reliable supplies: they maintain emergency stocks of materials and equipment, organise exercises for emergency response and recovery teams and implement other measures to ensure the continuity of production and logistical processes.

Risk of additional taxes on the use of hydrocarbons in the production of goods (carbon tax). The Company is developing approaches to raising ESG financing and issuing 'green' financial products. Another option is to raise ESG loans, whereby the interest rate on a loan is reduced if the borrower fulfils a number of environmental obligations in the course of NPP construction.

Risk insurance

GRI 103-2

Risk insurance is one of the main risk management approaches used by JSC Atomenergoprom. To improve the reliability of insurance coverage, in 2020, the Company continued to cooperate with the insurance community on the reinsurance of Russian operators against property risks. A significant share of liability of Russian NPPs for potential nuclear damage was transferred for reinsurance to the international pooling system[35]. This proves that the international nuclear insurance community acknowledges the safety and reliability of Russian NPPs to be adequate.

In 2021, the Company plans to continue to engage experts from the Russian Nuclear Insurance Pool and the international pooling system to audit key enterprises in the industry for insurance purposes.

[35] The international pooling system (IPS) comprised of International Nuclear Insurance Pools is an unincorporated organisation representing the interests of nuclear insurance pools from 27 countries.

Objectives for 2021 and for the medium term

The Company has developed an action plan for 2021 covering the key areas of the Risk Management Development Programme for the period from 2019 through 2024. This plan takes into account both external factors related to the requirements of foreign customers (NPP construction on time and on budget) and Russian government bodies and internal factors (the need to build an efficient risk management system aligned with global best practices).

The plan sets three key objectives for the development of risk management in the Russian nuclear industry:

- To develop an automated risk assessment and management system, which will, among other things, enable the Company to maintain and update a knowledge base of typical risks and risk management measures;
- To develop the risk management expert community in the industry;
- To adopt procedures (including initial assessment) for managing risks associated with projects and programmes in the sphere of new business development.

Plans for 2021 include implementing the first stage of the ISRM project pursuant to instructions from JSC Atomenergoprom and starting the pilot operation of the system.

Financial Management

Key results in 2020:

- A total of about RUB 40.5 billion was saved through intra-group financing between 2010 and 2020.
- Russian and international rating agencies rated JSC Atomenergoprom at the level of Russia's sovereign credit ratings.

Implementation of the financial strategy

Given the scale of JSC Atomenergoprom's business in Russia and abroad, the Company's management attaches special importance to the financial resilience of nuclear organisations in a changing environment. The financial strategy is an integral part of JSC Atomenergoprom's overall business strategy. The main aim of the financial strategy is to ensure the financial resilience of the Company and its organisations in a changing external environment and to maximise the efficiency of financing and financial risk management.

Key financial transactions of JSC Atomenergoprom have been centralised. Cash flow management is centralised through:

- A single industry-wide legal framework regulating financial management (including the Uniform Industry-Wide Financial Policy);
- Vertical integration of treasury departments in subsidiaries and affiliates, which are functionally accountable to ROSATOM's Treasury Department. The established treasury structure enables 100% control of funds in the industry;
- Concentration of principal treasury functions of nuclear organisations in ROSATOM's Treasury Department, which communicates with nuclear organisations in a shared information space and is essentially a liquidity management centre;
- An industry-wide automated system for recording treasury transactions (the Corporate Settlement Centre Information System), which enables the recording of all treasury transactions across the group on a daily basis.

Targets set for 2020 in the financial strategy in terms of engagement with banks, debt portfolio management as part of the day-to-day operations and projects of the Company and its organisations, and further centralisation of financial transactions were met. In order to improve the performance of the treasury functions, in 2020, the Company continued to work towards:

- Accumulating spare cash in the accounts of pool leaders[36];
- Improving the accuracy of payment scheduling (a rolling liquidity forecast);
- Maintaining a competitive cost of servicing of the consolidated debt portfolio;
- Centralising treasury transactions (complying with the financial policy);
- Introducing project financing instruments as part of project implementation by the Corporation and its organisations.

[36] A pool leader is an organisation on whose accounts spare cash is accumulated and subsequently redistributed between nuclear organisations through loan agreements.

In 2020, the Company continued to work towards further centralisation of the treasury function, including the development of a Payment Factory at JSC Atomenergoprom. This project is aimed at further improving the performance of the treasury function in the industry.

A total of about RUB 40.5 billion was saved in the industry through intra-group financing between 2010 and 2020.

Receiving and maintaining credit ratings

In the reporting year, JSC Atomenergoprom continued to take measures to maintain credit ratings assigned by the 'Big Three' international rating agencies (S&P, Moody's Investors Service and Fitch Ratings) and the national rating agency, JSC Expert RA.

As at 31 December 2020, JSC Atomenergoprom was rated at the level of Russia's sovereign credit ratings:

- BBB-/A-3 with a stable outlook by S&P;
- BBB with a stable outlook by Fitch Ratings;
- Baa3 with a stable outlook by the Moody's Investors Service international rating agency;
- ruAAA with a stable outlook by the national rating agency, JSC Expert RA.

Raising financing for day-to-day operations and for projects

As part of its day-to-day operations, the Company successfully maintains the average interest rate on its total debt portfolio[37] denominated in Russian roubles at 7%. Despite the economic crisis caused by the COVID-19 pandemic, throughout 2020, the Company maintained sufficient liquidity to ensure that it and its organisations operate normally and fulfil their contractual obligations on time.

Six of the Company's organisations (those included in the list of systemically important organisations, as well as their subsidiaries) obtained funding exceeding RUB 2.5 billion on preferential terms under a subsidy programme launched pursuant to Decree No. 582 of the Government of the Russian Federation dated 24 April 2020.

[37] Including the scope of ROSATOM.

The Company continued to use suretyship to secure obligations of organisations in the industry to their counterparties. This measure helps to reduce both the cost of bank guarantees and the cost of financing raised by the Company (including interest expenses).

The Company continued to search for sources of financing for projects in traditional and new business areas:

- The Company jointly with JSC Gazprombank developed a project finance arrangement for the construction of a wind farm with installed capacity totalling 340 MW. This is the first project involving the use of sustainable finance mechanisms: the price terms of the credit facility are linked with target indicators for the construction and operation stages. The use of this model is vitally important for the Company in the context of its efforts to accomplish long-term sustainable development objectives;
- Under a letter of intent between the Government of the Russian Federation and ROSATOM aimed at developing a high-technology area, Technology for New Materials and Substances, in Russia and in accordance with the approved road map, a financing model (with the total budget of the road map exceeding RUB 440 billion) and methodological guidelines for ranking individual investment activities (projects) under the road map were developed in 2020. Approaches to financing the road map and the methodological guidelines were adopted by the interdepartmental Executive Committee for the Road Map and the Expert Panel of the Competence Centre tasked with implementing the road map for the Polymer Composite Materials product area; the Expert Panel is chaired by Andrey Klepach;
- As a follow-up to the agreement on export credit support for the Company's projects from the French Export Credit Agency Bpifrance Assurance Export, the Company continued to cooperate with the French Ministry for the Economy and Finance in order to develop a fundamentally 'new mechanism' for financing the Company's overseas NPP construction projects. Despite challenges posed by the pandemic, throughout 2020 the Company held talks with the Ministry, which resulted in the development of a prototype of the 'new mechanism'. The fine-tuning of the 'new mechanism' and its adaptation to the special features of the Company's projects will continue in 2021;
- As a follow-up to the resolution of the VEB.RF Supervisory Board on the approval of participation of a banking syndicate (VEB.RF and JSC Gazprombank) in the project to build the multipurpose fast neutron research reactor (MBIR) based on the principles of the Project Finance Factory, independent due diligence of the project's organisational and legal structure was completed, and the terms of the syndicate's participation in the project were approved (with the target amount of funding to be raised from the banks totalling RUB 23.3 billion);
- As part of the implementation of projects to develop the Northern Sea Route, the Government of the Russian Federation approved Decree No. 11 dated 15 January 2020 on budget investment in the construction of the flagship icebreaker, Lider (totalling RUB 127.6 billion); in addition, the interdepartmental working group on the financing of icebreaker construction projects adopted an approach to the financing of Lider-class follow-on nuclear icebreakers under a federal concession model. The development of optimal concession terms will continue in 2021;
- As a follow-up to the resolution of the Government Subcommittee on the Implementation of Investment Projects in the Russian Far East chaired by Yury Trutnev, Deputy Chairman of the Government of the Russian Federation and Plenipotentiary Representative of the President of the Russian Federation in the Far Eastern Federal District,

the Company raised a loan on preferential terms (with the interest rate set at 5% per annum and the loan amount totalling up to RUB 5 billion);
- In order to promote project finance instruments in the industry, accumulate and share the relevant experience, the Company established an expert panel on the structuring of project finance;
- The Company continued to promote financial and non-financial support instruments offered by JSC Russian Export Centre in the industry (including holding regular working group meetings attended by representatives of JSC Russian Export Centre and nuclear organisations). More specifically, JSC Russian Export Centre supported the signing of corporate competitiveness improvement programmes (CCIPs) by the Ministry of Industry and Trade of Russia with three of the Company's organisations;
- An interdepartmental working group on cooperation on strategic priorities and promising development areas was formed with the Autonomous Non-Profit Organisation Agency of Technological Development (the competent agency of the International Fund of Technological Development).

Plans for 2021 and for the medium term

- To roll out the Payment Factory project;
- To ensure a consistent payment discipline for intra-group financing;
- To improve the accuracy of medium-term cash flow planning;
- To prevent internal competition for credit resources between organisations;
- To continue to centralise cash management;
- To focus on maintaining relations with supporting banks as the most reliable partners providing accessible funds in terms of both volumes and cost;
- To fulfil all obligations (including covenants) to existing lenders and rating agencies;
- To discuss project financing arrangements in order to reduce recourse on the Company and minimise the use of its consolidated investment resources (including through the use of project financing instruments);
- To expand the range of financing instruments used by the Company (where it is economically feasible to do so) in order to reduce the cost of debt service and ensure timely and full financing of the investment programme of organisations in the industry on acceptable terms and conditions;
- To discuss potential areas of cooperation in the sphere of digitisation with banks.

7.4 Investment Management

Key results in 2020:

- The investment programme was 73% completed.
- Return on the investment portfolio stood at 14.2%.

Key approaches to investment management

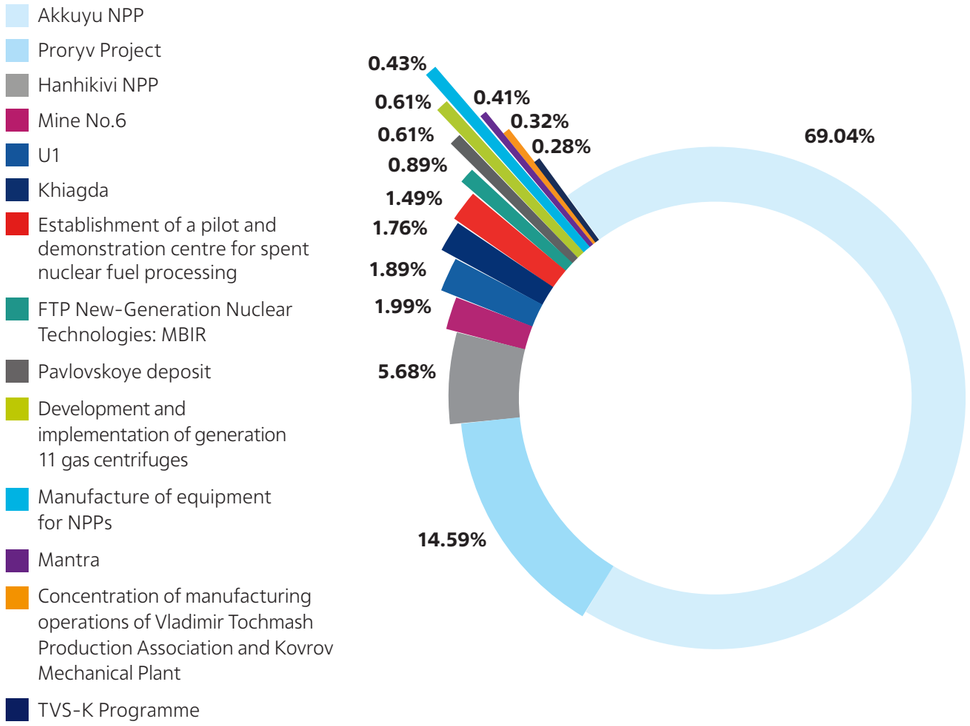
- A distributed system has been built for investment decision-making by the governing bodies of the Company and its organisations; it is aligned with the distribution of competence centres in the industry;
- A phase-gate approach is applied to project implementation, with decisions on key milestones made in a staged process;
- Key projects are monitored at the corporate level;
- Investment decisions related to day-to-day operations of assets are delegated to the Company's organisations in order to speed up the decision-making process;
- To improve the quality of investment decision-making, opinions of experts independent from the project initiator are taken into account;
- Investment activities are based on an 'open innovation' model, which involves searching for ideas and projects outside the industry (through the Innovation Hub and a venture capital fund);
- The Company's project portfolio is built as a set of projects of organisations in the industry for a year and for the medium term based on available investment resources and the required rate of return;
- Experts are engaged to perform an in-depth probabilistic risk analysis for significant projects; the findings of analysis are incorporated in the decision-making system;
- A comprehensive audit is conducted, which helps to formulate recommendations on how to improve project planning and implementation;
- Measures to raise external financing for projects are being developed.

Results in 2020

In 2020, the investment programme of the Russian nuclear industry was 73% completed[38]. A decline in performance against the targets of the investment programme (including in the Divisions) compared to previous periods was caused by a postponement of project activities due to restrictions imposed in 2020 in response to the COVID-19 pandemic.

At the same time, overall return on the investment portfolio exceeded the target for 2020 and stood at 14.2%[39].

Breakdown of investments in significant projects[40]



[38] Including the investment programme of JSC Rosenergoatom.
[39] Calculated for the period from 2020 through 2088.
[40] Apart from NPP construction in Russia.

Operations of the industry venture capital fund

A venture capital fund, Digital Evolution Ventures, founded by JSC Atomenergoprom and LLC Orbita Capital Partners in 2018, continues to work actively towards creating a diversified portfolio of promising projects in various development stages. The fund's investment activities are focused on innovative projects, including those aimed at developing breakthrough technologies, new materials and products that can be used in various sectors of the Russian economy and at maintaining its competitiveness on the global market in the long term.

To date, the fund has already invested over RUB 1 billion. Its investment portfolio comprises 12 projects in the following areas: Energy Storage Systems, the Smart City, Digital Medicine, Artificial Intelligence, the Internet of Things and Neurotechnology. A list of about 200 promising projects has been compiled.

The format of the fund (an investment partnership) enables it to generate interest among market investors and attract them to the fund, doubling or even tripling the initial amount of investments.

Measures to improve investment efficiency

As part of preparation for the implementation of the Comprehensive Programme titled 'Development of Technical Capabilities, Technology and Scientific Research in the Use of Nuclear Energy in the Russian Federation until 2024' (hereinafter referred to as the Programme), in the reporting year, the Company formulated the key principles and developed a model for managing the Programme in the Company and its organisations.

The Company updated the Comprehensive Programme of Measures to Improve the Maturity of Project Management in JSC Atomenergoprom and Its Organisations.

Employees in the industry continued to develop their competences at the Project Management School. 428 people underwent assessment and subsequent training in 2020.

Challenges in the reporting period and mitigation measures

Challenges	Mitigation measures
Restrictions on face-to-face contact due to the global pandemic	Investment processes have been adapted to remote work: processes have been set up for remote review, alignment and approval/sign-off of decisions on individual projects and the portfolio as a whole.
Slow speed of review of initiatives for the purposes of investment decision-making	An industry-wide competence centre in the sphere of project management has been established; the centre provides resources for project review and implementation. Processes for preparing project data sheets and arranging investment and financial project reviews have been optimised.
Lack of a single mechanism for accumulating and sharing project experience	A methodology for documenting project experience has been adopted. A statement of work for maintaining a knowledge base has been drafted and has been included in the action plan for improving the corporate IT system for portfolio management.
In-house development is too slow to meet the business need for market promotion	The Company has launched systematic efforts and has started to form business partnerships with development institutions, industrial parks, incubators, small and medium-sized businesses in order to search for and select technological solutions to meet the industry needs for the development of promising business areas: organisations in the industry have placed more than 150 orders for technologies with 80 organisations; about 50 proposals have been received.

Plans for 2021 and for the medium term

- To continue to develop project methodology on a systematic basis; to expand the scope of resources provided to project initiators by the specialised industry-wide centre;
- To implement the Comprehensive Long-Term Programme of Measures to Improve the Maturity of Project Management in the Russian Nuclear Industry;
- To expand the practical application of road maps in portfolio investment management;
- To adjust project execution plans in order to minimise the lag caused by restrictions imposed in 2020 in response to the pandemic;
- To increase the level of digitisation of projects and investment activities.

7.5 Internal Control System

Key results in 2020:

- Inspections conducted in Russian nuclear organisations by Russian government bodies did not reveal any major violations that had not been detected by the industry-wide Internal Control and Audit Function.

GRI 103-2

The internal control system is based on:

- Russian laws and regulations;
- The IAEA requirements;
- The COSO model (The Committee of Sponsoring Organisations of the Treadway Commission);
- Guidelines for Internal Control Standards for the Public Sector by the Internal Control Standards Committee of the International Organisation of Supreme Audit Institutions (INTOSAI).

Key characteristics of the internal control system include the following:

- Preventive control and development of timely, comprehensive and practicable corrective measures;
- Efficient communication and cooperation with operating divisions at all stages of operations;
- Proactive change management;
- Growing demand from executives in the Company's organisations for advisory services provided by the Internal Control and Audit Function (ICAF).

Results in 2020

Inspections conducted in organisations

In the reporting year, the specialised internal control bodies (SICBs) of ROSATOM and JSC Atomenergoprom conducted 646 inspections in Russian nuclear organisations.

External supervisory bodies conducted 18 inspections, including 12 inspections by the Accounts Chamber of the Russian Federation. No instances of misuse or illegal use of budget funds or assets were detected.

Following the inspections, the ICAF developed 667 corrective measures and approved them for implementation.

Stakeholder control

In 2020, an updated version of the Partner Special Monitoring and Analytics Unit became operational. This is a solution designed for integrating the Company's information systems in real time; it contains full information on complaints regarding procurement processes in the nuclear industry, as well as indicators for online monitoring of procurement procedures.

The Company continues to maintain a public information system for calculating the business reputation score of suppliers, which is one of the key risk assessment tools used in the course of procurement in the nuclear industry.

The Company carries out methodological work to produce recommendations and proposals for improving procurement processes in the nuclear industry based on the findings of investigation of complaints.

The Central Arbitration Committee and the arbitration committees of the Power Engineering, Fuel and Engineering Divisions received 899 reports (complaints) from stakeholders regarding violations of procurement rules established by Russian legislation, the Company's Uniform Industrial Procurement Standard (UIPS) (the Regulations on Procurement) and other regulations of the Company and its organisations supporting the UIPS. 596 complaints were investigated; 140 complaints (23.5% of the total number of investigated complaints) were deemed to be valid. Other complaints were withdrawn by complainants or were dismissed on the following grounds:

- Because the deadline for filing the complaint had expired;
- Because a similar complaint had been accepted for investigation or investigated by the Federal Antimonopoly Service;
- Because the complainant was not entitled to file a complaint (after the deadline for submitting bids has expired, complaints may only be filed by bidders that have submitted a bid);
- Because the defendant had taken corrective measures to address the violation before the complaint was investigated by an arbitration committee.

Changes in indicators pertaining to control activities

Indicator	2018	2019	2020
Third-party inspections			
Number of inspections			
Number of inspections by external supervisory bodies	15	22	18
including inspections by the Accounts Chamber of the Russian Federation	7	13	12
Outcomes of inspections			
Number of actual incidents or significant shortcomings detected by government agencies as a result of inspection of processes in the Company and its organisations that had not been detected by the ICAF	0	0	0
Quality of organisation and performance of internal financial control and internal financial audit as assessed by the Russian Ministry of Finance	100%	96.8%	100%
Internal inspections			
Number of inspections			
Number of inspections by specialised internal control bodies (SICBs)	726	704	646
Outcomes of inspections			
Number of corrective measures implemented following the inspections	484	622	667
Number of employees on whom disciplinary sanctions were imposed	811	586	369
including senior managers	4	11	12
Stakeholder control			
Number of complaints			
Number of complaints filed with the arbitration committees of the Company and its Divisions regarding violations of procurement rules	914	902	899
Number of reports (complaints) accepted for investigation	588	606	596
Outcomes of investigation of complaints			
Number of valid complaints	154	157	140
Valid complaints as a percentage of the total number of investigated complaints	28%	26%	23.5%
Valid complaints as a percentage of the total number of purchases	0.23%	0.21%	0.19%

Plans for 2021

- To monitor the implementation of federal projects and strategic programmes involving the Company and nuclear organisations;
- To continue to improve control activities of the SICBs at the level of enterprises;
- To shift the focus of the SICBs to control and analysis;
- To master project audit and strategic audit techniques.

CHAPTER 8

HR POLICY AND SOCIAL RESPONSIBILITY

8.1 Personnel Management

Key results in 2020:

- The average monthly salary totalled RUB 95,200.
- 30.1% of employees were aged under 35.
- 129 graduates of core universities were hired by the Company.

GRI 102-7
GRI 102-8

For JSC Atomenergoprom to achieve its strategic goals, it is necessary to fully unlock the potential of its employees. Accordingly, people are the Company's most important capital. The Company's HR policy prioritises the rapid development of competences, the ability to work in a new, changing environment and the training of leaders at all levels.

In 2020, JSC Atomenergoprom and its organisations employed 140,390 people. 87,000 employees have a university degree. 1,499 employees are Candidates or Doctors of Sciences.

30.2% of employees are women and 69.8% are men.

The age of employees averaged 43.1 years. 30.1% of employees were aged under 35.

Performance management

GRI 103-1
GRI 103-2

In order to standardise approaches to the development and implementation of the HR policy in the nuclear industry as part of a uniform governance approach, a performance management system has been introduced in the Company's organisations.

The current industry-wide performance management system ensures the continuity of the Company's long-term and operational goals and helps to align them with the goals and objectives of employees. The key performance indicators of JSC Atomenergoprom, as approved by the Supervisory Board, are decomposed from the top management level to the heads of industry organisations up to and including the sixth management level.

The industry-wide approach to performance management is based on standardised principles, which provide uniform criteria for decision-making on remuneration, horizontal and vertical movement of employees, their inclusion in succession plans and nomination as candidates for inclusion in the succession pool.

The performance management process is automated through an integrated industry-wide system, RECORD.

Code of Ethics

GRI 102-16
GRI 102-17

ROSATOM and JSC Atomenergoprom have adopted a Code of Ethics and Professional Conduct for Employees. The Code of Ethics communicates the key values of the nuclear industry and defines the relevant ethical principles of employee conduct when interacting with a wide range of external and internal stakeholders. The rules of conduct set out in the Code concern combating corruption, protecting the Company's resources, property and information, occupational health and safety, industrial and environmental safety, conflict prevention and resolving conflicts of interest, as well as maintaining the corporate image.

The Code of Ethics is available on the Corporation's official website[41].

Personnel costs

In 2020, personnel costs totalled RUB 215.3 billion, up by 7.9% year on year. Costs per employee increased from RUB 1,419,000 in 2019 to RUB 1,533,000 in 2020 (up by 8.1%).

Structure of personnel costs, %

	2018	2019	2020
Payroll	74.6	74.6	74.9
Insurance contributions	20.9	21.0	20.9
Social and other expenses (including training)	4.5	4.4	4.2

[41] https://rosatom.ru/upload/iblock/d08/d08a5dc6dedea5cf251f81e14f8742d7.pdf.

Remuneration system

The Company's current remuneration system:

- Provides competitive remuneration matching the level of remuneration in the best companies in Russia;
- Is result-based: the size of an employee's salary is linked to their efficiency, professionalism and achievement of key performance indicators (KPIs).

In accordance with the requirements of the integrated industry-wide remuneration system and the uniform industry-wide performance management policy, the size of the annual bonus paid to employees depends on achieving KPI targets and reflects progress in achieving the key performance targets of the Company and its organisations.

KPIs of executives are based on strategic goals, priorities and key performance indicators; strategic objectives set for organisations are converted into KPI maps of their executives and cascaded down to business units and employees.

In 2020, the average monthly salary per employee of JSC Atomenergoprom increased by 8% compared to 2019 and totalled RUB 95,200 per month.

Executive succession pool

In order to ensure succession and train employees to be appointed to managerial positions, an executive succession pool (ESP) is being formed and developed in the Russian nuclear industry.

ESP members are included in the succession pool through the career and succession planning process. The ESP is divided into four levels in order to select development programmes that are best suited to the target positions of ESP members. The ESP level is determined based on the target position:

- ROSATOM's Assets and ROSATOM's Assets. Basic Level (top and senior executives);
- ROSATOM's Capital (middle-level executives);
- ROSATOM's Talents (promising specialists and junior executives).

Since the establishment of the executive succession pool, the number of its members has exceeded 5,000. 79.65% of ESP members were appointed to a new position by the end of 2020.

Number of ESP members with a breakdown by gender

Gender	2018		2019		2020	
	Number	Share	Number	Share	Number	Share
men	2,884	79%	2,884	79%	3,918	78%
women	765	21%	765	21%	1,093	22%

Appointments of ESP members to a new position, %[42]

	2018	2019	2020
Share of ESP members appointed to vacant top and senior executive positions (top 30 and top 1,000 executives in the industry)	63.6	67.5	68.17
Share of ESP members among senior, middle-level and junior executives appointed to a new (management) position	72.30	74.36	79.65

A special feature of succession pool development programmes is their practical focus. Future executives not only complete training modules, but also work on their own projects contributing to the achievement of strategic goals. In 2020, ESP members completed a modular training programme aimed at developing managerial knowledge and skills.

Training as part of ESP development programmes

ESP level	Development programme	Key training topics	Number of participants[43]		
			2018	2019	2020
Senior executives	ROSATOM's Assets	Shaping the Future, Virtuosos of Management, Communication in Times of Change, Marketing, Finance	304	324	368
	ROSATOM's Assets. Basic level	Strategy, Leadership and People Management, Change Management and Horizontal Interaction, Marketing, Finance	180	250	368
Middle-level executives	ROSATOM's Capital	Leadership and Project Management, Advanced Leadership Skills, Data Management, Situational Leadership	1,490	1,800	2,060
Junior executives	ROSATOM's Talents		1,675	1,956	2,215
Total			3,649	4,330	5,011

[42] Since 2018, the calculation of the indicator has changed: the promotion of succession pool members was assessed based on the number of ESP members appointed to new positions over the last three reporting years. In 2019 and 2020, the assessment focused on the share of promoted ESP members who had been included in the ESP in 2017 and 2018, respectively.
[43] The number of participants included in the ESP is shown as a cumulative total for the period from 2018 through 2020

Successor assessment

In order to facilitate rapid competence development, which is one of the priorities of the Company's HR policy, an innovative approach to assessing high-potential employees has been introduced in the Russian nuclear industry. As part of this approach, executives are involved in talent pool assessment and have a greater personal responsibility for developing succession plans and reducing the duration and cost of assessments. The methodology is based on the best practices adopted in major international companies and was piloted in 2018. In 2020, the methodology was rolled out in 10 divisions in the industry (77 organisations), and 2,021 candidates for executive positions were evaluated by managers of enterprises and holding companies. Following the evaluation, each candidate received feedback providing them with a clear insight into their career prospects and recommendations for development.

Career counselling

To achieve ROSATOM's 2020-2030 Vision of Being the Best in Unlocking Employees' Potential, in 2020, the Company launched a new service for employees: individual career counselling. 15 specialists advise employees in the industry on their career tracks and career development plans. During the year, 511 consultations were held in more than 20 organisations in the industry.

Enquiries handled by in-house career counsellors include the following:

- Which career path to choose: the management, project, or expert one?
- Where to search for job vacancies in the industry?
- Who do I contact to apply for a job?
- How to draw up an individual development plan?
- How can I make myself known through industry programmes?
- How do I prepare for discussing my career plan with my supervisor?

Following the pilot launch, the service has produced a positive response from employees (94% would recommend the service to their colleagues, and 92% are satisfied with the advice they have received). At the end of 2021, after training additional career counsellors, the service will be made available in about 40 organisations in the industry.

Employee training

GRI 103-1

The Company's HR policy prioritises competence development and employee training. More than 48,800 employees of JSC Atomenergoprom underwent training or retraining or completed professional development programmes in 2020.

Annual average training hours per employee in the industry by employee category

GRI 404-1

Employee category	2018	2019	2020
Executives	45	55.8	60.0
Specialists and white-collar workers	21.7	30.7	34.8
Blue-collar workers	34.9	33.1	44.0

GRI 404-2

Traditionally, training for specialists and executives in the industry is provided primarily by the Corporate and Technical Academies of ROSATOM. Currently, both Academies are full partners of the Company in the implementation of strategic objectives; they implement projects directly relevant to prioritised areas of business development. These include the training of participants in the Company's global projects, the development of the executive succession pool, and training programmes for entrepreneurial leaders responsible for creating new products, digital leaders and ROSATOM Production System leaders.

The portfolio of the Technical Academy currently comprises about 500 training programmes aimed at developing vocational knowledge and skills. The portfolio also includes courses on occupational safety and health, industrial, environmental and fire safety, information security, energy security and civil defence.

The portfolio of the Corporate Academy comprises more than 320 training programmes, as well as more than a dozen industry-wide projects focused on promoting the employer brand among schoolchildren and students, recruiting talented graduates, developing the corporate culture in the field of digitisation and safety, developing employees' leadership potential, developing the competences of workers and engineers in accordance with WorldSkills standards, etc.

GRI 403-5

Distance learning is gaining traction. In 2020, the share of distance learning was 48%. Employees in the industry completed 488,335 courses on the RECORD mobile training platform totalling 363,225 man-hours. The catalogue of educational content available on the RECORD mobile training platform contains more than 1,500 units in different formats: courses, recordings of lectures and webinars, video interviews and podcasts. The most visited sections are 'ROSATOM for ROSATOM' and 'Promoting Digital Literacy'.

Participation of employees in external and industry-wide professional competitions

Leaders of Russia

Employees of JSC Atomenergoprom actively participate in the Leaders of Russia national management competition. More than 1,000 industry employees participated in the third Leaders of Russia competition (2019/2020).

Forty-six employees were invited to the semi-finals of the competition, with six people reaching the super final. Winners included two representatives of ROSATOM.

WorldSkills

Employees in the nuclear industry achieved impressive results in professional events and competitions.

ROSATOM's team topped the medal table of the WorldSkills Hi-Tech National Competition of Cross-Industry Skilled Professions for Workers in High-Technology Industries held in accordance with the WorldSkills methodology for the sixth time.

In the WorldSkills Hi-Tech 2020 Competition, which featured a combination of remote and face-to-face formats, 100 representatives of nine Divisions of the Company competed in 18 of the 24 skills represented in the main competition and in nine skills in the 2nd Skills of the Wise National Competition.

The participants won a total of 25 awards: 13 golds, nine silvers and three bronzes, as well as two top prizes of the competition: Master of Industry Development certificates from the Industry Development Fund worth RUB 1,000,000 (they were awarded to the winning team in the Life Cycle Management category and to the team of expert mentors who had trained the champions).

The AtomSkills industry-wide competition, which is the world's largest corporate professional skills competition held in accordance with WorldSkills standards, was held in an open format. More than 1,100 contestants from 48 regions of Russia took part in the competition, including 836 employees of the Company, 59 specialists from Gazprom, Rostelecom, SIBUR and other third-party companies, and 226 college and university students.

The competition was held across 24 competences in the nuclear industry. Another ten competences, for which competitions were not held due to pandemic-related restrictions, were presented as part of the Technological Competence Development track of the Business Programme.

The Business Programme included more than 170 events (panel discussions, conferences, briefings, webinars, talk shows and workshops) broadcast online and grouped into two thematic tracks: 'Mission: Talent. Becoming the Best in Unlocking Potential' and 'Technological Competence Development'. About 5,000 participants, including more than 200 speakers from 35 regions of Russia, were involved in the online events. About 700,000 people watched over 300 hours of broadcasts.

ROSATOM's Person of the Year

A record number of applications were submitted as part of the industry-wide recognition programme, ROSATOM's Person of the Year, whereby top executives express their appreciation for the achievements of the best employees in the nuclear industry for the year. The programme includes more than 50 individual and team nominations in three areas: divisional professions, company-wide professions and special nominations put forward by the Director General and the Chairman of the Supervisory Board. Key selection criteria include major work achievements, the ability to think out of the box, commitment to corporate values and professional qualities of the candidates. To support the launch of the industry-wide volunteer movement and activities through which the nuclear industry contributes to achieving the UN Sustainable Development Goals and improving the quality of people's life, a new special category, Sustainable Development, was introduced in 2019, with nominations put forward by the Director General. Another special category, Reliable Support, was introduced in 2020; it focuses on initiatives aimed at supporting businesses during the pandemic. Due to a challenging epidemiological situation in the country, the award ceremony will be held in May 2021 for the finalists of the past two years.

Digital competences and culture

As part of the Digital Competences and Culture programme, the Company took steps to support the implementation of a uniform digital strategy and to enable effective work and development in a digital environment.

Key outcomes included the following:

- The amount of training in digital competences (measured as the number of participants multiplied by the number of completed courses) totalled 70,000 person-courses.
- More than 150 organisations in the nuclear industry prepared digital initiatives as part of the Digital Seasons club for digitisation leaders.

- A community of digital brand ambassadors was launched. The first 17 ambassadors began to promote the brand on social media and at external events.
- 19,000 schoolchildren and students were covered by digitisation activities organised by the Company as part of federal and industry-wide projects.
- A diagnostic assessment of maturity of the digital culture was conducted. More than 1,000 employees of nuclear enterprises were covered by the programme to develop the digital culture, including the Customer Journey programme, My Best Mistake sessions and the Digital Leader movement.
- The first industry-wide conference on digitisation was held in a hybrid format; it was attended by more than 700 participants from 85 enterprises.
- Training was made available on any device anywhere 24/7 through the RECORD Mobile application and web portal, with 45,500 authorised users, over 25,000 active users, 3,900 logins per day, more than 1,400 units of content and a user rating of 7.2 points out of 10.0.
- A new service, the Employee's Personal Account, was made available to 50,000 employees, enabling them to arrange a business trip or vacation fully online with no need for a personal visit to the HR department. The service comprises a total of 20 functions, including leave, business trips, certificates, transfers and 'my income'. The user rating stands at 4.7 out of 5.0.
- Employees of six pilot enterprises became users of the first version of the Digital Assistant. This is a chatbot that helps generate an online request and get a prompt response on popular services (remaining leave, a leave application or a business trip request, requests for certificates and copies of documents, technical support, account password recovery).

Activities of Change Support Teams (CSTs)

The nuclear industry has a tradition of supporting 'bottom-up' initiatives and thus enabling talented employees to fulfil their potential.
CSTs comprise proactive employees who implement projects to drive changes. Participation in the CSTs not only enables them to put their ideas into practice, but also provides an informal channel for prompt and direct communication with industry executives. In turn, this provides employees with new career opportunities and becomes an effective tool for developing future leaders at the local level. By the end of 2020, more than 140 change support teams had been formed, comprising about 1,500 employees from various organisations in the industry. Projects initiated by employees as part of this movement have produced impressive results at the industry level, with one of the projects reaching the finals of the Person of the Year industry-wide recognition programme and another reaching the finals of the #WeAreTogether federal competition. The engagement rate of CST members stood at 86%.

Projects aimed at improving the efficiency of horizontal interaction between employees

In order to speed up decision-making and implementation, the industry is actively working to improve the efficiency of horizontal interaction. In 2020, an online training marathon, ProPartnership, was launched with more than 450 industry executives participating. An online course was developed and was completed by more than 4,500 employees.

The first corporate series on challenges related to interaction in the team and horizontal interaction tools that help to respond to them was filmed. It was viewed more than 69,000 times within less than a year. All episodes are based on real-life cases in the industry.

Corporate volunteering

GRI 103-2

In 2018, an official decision was made to launch a corporate volunteering programme and develop an integrated system for planning and implementing volunteer initiatives in the nuclear industry.

This system is based on the following principles:

- Alignment of projects with the needs of the region based on the level of its social and economic development and non-profit organisations operating in the region;
- Alignment with sustainable development goals prioritised by the Company;
- Alignment with national development goals and regional practices;
- Alignment of initiatives with the mission and values of the organisation and expectations of key stakeholders;
- The focus of projects on providing long-term benefits to the region as a whole and improving the standard of living of a specific group of beneficiaries. These benefits must be clear and measurable.

As part of 'vertical' management, a pool of industry-wide projects and standardised campaigns was formed, and general guidelines were prepared for all organisations in the nuclear industry.

These projects are grouped into **five main areas** of volunteer activity:

- Environmental conservation;
- Supporting socially disadvantaged groups and veterans;
- Promoting a healthy lifestyle;
- Social integration and mentoring;
- Intellectual volunteering (leveraging employees' professional skills in the regions of operation).

As part of the efforts to promote and launch initiatives across the five prioritised areas, in 2020, a number of major projects were launched or actively developed.

As part of **assistance to socially disadvantaged groups, retirees and veterans**, a visiting care service, **We Are Responsible**, was launched in the industry as an extension of the #WeAreTogether campaign; it involves volunteers providing ongoing targeted assistance to retirees and veterans and participating in initiatives that contribute to the socialisation of the older generation.

As part of **environmental** initiatives, most enterprises in the industry organised centralised collection of solid domestic waste and launched awareness-raising campaigns to promote environmental culture: the topic is covered in activities and printed materials for employees' children; information materials on responsible consumption practices are distributed; volunteers conduct environmental campaigns on a regular basis.

The topic of resource conservation is also covered in educational events for residents of nuclear towns and cities; some towns and cities have implemented a comprehensive programme on energy conservation for schoolchildren and students, which includes lectures, virtual tours, educational games and programmes for the Quantorium children's science park.

In 2020, about **300 volunteer** campaigns were conducted in the Company.
The total number of volunteers at ROSATOM **exceeds 5,000 people**.

Social integration and mentoring initiatives include not only engagement with schoolchildren and students at core universities, but also thematic workshops and meetings with representatives of disadvantaged groups, such as children from orphanages, persons undergoing long-term medical treatment or homeless people. Training is also provided for non-profit organisations and small businesses to enable them to find new solutions for optimising processes and expanding their target audiences.

Over three years of the paper and cardboard collection programme, employees of Rostov NPP sent 90 tonnes of waste paper and cardboard for recycling. As part of the Ecocity project run by Leningrad NPP, in 2020, over a tonne of plastic waste was sent for recycling in the town of Sosnovy Bor.

As part of **intellectual volunteering**, employees implement pro-bono projects aimed at developing infrastructure in nuclear towns and cities. These include solutions to optimise transport routes, pass systems, urban navigation and the development of convenient creative spaces. These projects are informed by an analysis of the needs of local residents.

The system for managing volunteer activities involves project development both along a functional hierarchy (in the key organisations in the industry, an authorised supervisor is responsible for coordinating volunteer initiatives; at the same time, there is an overall industry-wide strategy) and as part of horizontal interaction between leaders of the volunteer movement at the local level and the sharing of experience between organisations.

In the closed administrative and territorial formation of Snezhinsk, a project was implemented to introduce pedestrian crossings with flexible traffic speed control. In Zelenogorsk, employees of JSC Electrochemical Plant piloted the Business Technology in Education project to optimise administrative processes in the town's schools; they also provided training to the teaching staff. In addition, volunteers implemented a project titled 'Convenient Routes for a Smart City', which addressed the logistical problem of determining a convenient location of stops and routes through the development of a software program for creating a digital copy of the town, analysing data and displaying the results.

Dedicated communication channels were created; these include thematic corporate mailing lists and accounts on social media, to which a total of more than 14,000 users are subscribed.

Employees are free to choose volunteering initiatives, including outside the areas prioritised by JSC Atomenergoprom. The Company supports all initiatives that are of interest and importance to the beneficiaries. Thus, the engagement rate among participants in the volunteer movement stood at 86% (compared to 84% across the industry).

Volunteer training

To improve the quality of corporate volunteering projects, regular training is provided to employees responsible for the development of this area; in addition, thematic workshops for volunteers and communication campaigns are conducted to stimulate employees' interest in specific areas of corporate volunteering and environmental culture.

In 2020, a comprehensive educational programme for volunteers was developed; it includes a total of more than 30 training and team-building events involving market experts, such as representatives of non-profit organisations and public figures.

Online project: ROSATOM's Volunteer School

Over four months in 2020, more than 500 people from 40 nuclear towns and cities attended remote (online) training events involving the heads of key Russian non-profit organisations.
Volunteers integrate the knowledge acquired during the training sessions into existing volunteer programmes in the industry and leverage this knowledge to develop new volunteer projects. Families of the participants were also involved in the activities. The youngest student at the School was 15 years old, and the oldest was 73 years old.

In order to promote the development of the volunteer movement and generate new initiatives, it was decided to hold the annual Anatoly Alexandrov Corporate Social Responsibility and Volunteering Competition.

This competition is held in order to identify best practices, develop the system for managing social projects and volunteering, communicate sustainable development goals to employees, establish criteria for evaluating the effectiveness of social projects and proceed to form cross-divisional teams focused on specific thematic areas.

Thanks to the established management hierarchy and a high level of involvement in volunteer activities, one of the highlights of 2020 was the participation of employees of JSC Atomenergoprom's organisations in the #WeAreTogether national campaign. More than 1,100 volunteers processed about 11,000 requests for assistance in 42 towns and cities of Russia. More than 19,500 families received food aid. In addition, at the very beginning of the pandemic, more than 200 senior executives in the nuclear industry joined the campaign and donated their monthly salaries to its fund.

A total of 204 applications were submitted for the competition from all Divisions of ROSATOM and JSC Atomenergoprom, as well as a large number of organisations outside the scope of the Divisions; the total number of participants and their team members exceeded 800 people.
The projects were selected in three categories: the Best Volunteer Project, the Best CSR Project and the Best Idea for a Social or Environmental Project.

More than 20 employees in the nuclear industry were awarded commemorative medals and certificates from the President of the Russian Federation 'For Personal Contribution to the #WeAreTogether National Campaign for Mutual Assistance'.

Social policy

JSC Atomenergoprom's social policy is designed to:

- Make the Company more attractive as an employer;
- Recruit and integrate young professionals and highly skilled specialists;
- Increase employee loyalty, and
- Increase the efficiency of social expenditure.

Benefits provided to employees and retirees are aligned with the Uniform Industry-Wide Social Policy, which is based on standardised corporate social programmes.

Key corporate social programmes of JSC Atomenergoprom, RUB million

GRI 403-6

	2018	2019	2020
Voluntary health insurance	1,180.8	1,454.2	1,586.0
Accident and illness insurance	51.1	52.5	54.7
Health resort treatment and recreation for employees and their children, including:	702.2	739.8	416.8
health resort and rehabilitation treatment for employees	523.4	600.1	357.8
health resort treatment and recreation for children	178.8	139.7	59.0
Provision of housing for employees	714.6	491.2	614.3
Private pension plans	359.4	269.2	357.6
Support for retirees	917.6	967.0	893.4
Catering arrangements	32.2	54.2	355.2
Sporting and cultural events	955.1	1,031.4	1,034.4
Assistance to employees	1,392.4	841.9	936.5
Other	558.8	-	-
Total:	**6,864.2**	**5,901.5**	**6,249.0**

GRI 402-1

In 2020, the Company piloted a new corporate social programme focused on employee well-being, whose main goal is to improve the quality of employees' life. The programme is informed by employees' requests and needs and includes measures to improve their physical, professional, financial, emotional and social well-being.

Collective bargaining agreements cover 80% of employees in JSC Atomenergoprom's enterprises.
The mininum notice period for significant operational changes is stipulated in Article 82 of the Labour Code of the Russian Federation.

GRI 401-2

Compensation and benefits under corporate social programmes implemented by the Company are provided to full-time employees.

GRI 102-41

JSC Atomenergoprom adheres to an Industry-Wide Agreement on Nuclear Power, Industry and Science for 2018-2020. The Agreement is based on the established practice of social partnership in the nuclear industry and is aimed at implementing the Integrated Standardised Remuneration System, the Uniform Industry-Wide Social Policy and the Occupational Health and Safety Management System.

The Agreement prioritises the protection of employees' life and health (see also the section 'Occupational Safety and Health'). Employers, jointly with the Russian Trade Union of Nuclear Power and Industry Workers, maintain records and analyse employee morbidity, including the results of periodic medical examinations and sick leave, and develop a comprehensive health improvement programme titled Health. The Agreement incorporates the opportunities provided by the legislation on special assessment of working conditions (SAWC) and establishes an additional mechanism for cooperating with the trade union in carrying out SAWC and analysing its findings. 55.7% of Atomenergoprom's employees are trade union members.

GRI 403-5

Protecting our employees

During the pandemic, JSC Atomenergoprom managed not only to maintain the scope of its employee training and development programmes, but also to make a 'quantum leap' in the transition to digital resources and to create a fully fledged digital training environment. 76% of face-to-face programmes were converted to a distance learning format. An important achievement of 2020 is the continuity of compulsory training. In 2020, 53.5% of compulsory training was conducted remotely and online to the required standard.

Within the shortest possible time, the Company managed to develop 196 new distance learning courses with a total duration of more than 800 hours, as well as 270 training podcasts and videos. The Company also held more than 3,500 online training events that garnered over 1,200,000 views worldwide. Open webinars available to the general public proved especially popular, with about 15,000 people participating in these events and another 15,000 employees watching the recordings. Online conferences were attended by 9,000 employees in the industry.

Amid the pandemic, a major campaign was launched to help employees in the industry combat COVID-19. Regular webinars were held on the topics of COVID and anti-COVID measures, remote work, work-life balance and self-discipline; numerous leaflets and posters on compliance with anti-COVID measures were issued; Golden Rules of Safe Conduct were developed, and their active implementation was initiated at the local level; and a catalogue of best practices adopted in the industry was compiled.

Recruiting young professionals

GRI 103-1

JSC Atomenergoprom attaches great importance to working with young professionals and recruiting talented young people into the nuclear industry.

One in every three young employees hired in the Russian nuclear industry in 2020 had graduated from university with distinction.

In 2020, a total of 671 students studied at universities under arrangements with JSC Atomenergoprom.

The Company continued to organise work placements for students from specialised educational institutions: 1,561 students completed internships in the Company's organisations in 2020.

In 2020, JSC Atomenergoprom's organisations hired 129 university graduates.

In accordance with the industry forecast on demand for specialists who have received university education or secondary vocational education until 2030, JSC Atomenergoprom is expected to hire an average of about 1,000 graduates of core universities per year, including about 360 graduates from the National Research Nuclear University MEPhI (NRNU MEPhI) and its branches.

International cooperation in education

GRI 103-1

ROSATOM and JSC Atomenergoprom successfully export Russian nuclear education to potentially attractive markets. International students study at NRNU MEPhI, as well as at core universities and partner universities.

In 2020, more than 1,800 foreign students from 54 countries, including Armenia, Vietnam, Rwanda, Bolivia, Uzbekistan, Turkey, Bangladesh, Jordan, Egypt, Algeria, Nigeria, Kenya, Kazakhstan, Congo, Ethiopia, Hungary, Serbia, Bulgaria, South Africa, Ghana and other countries studied at Russian universities. In 2021, another 199 students from 66 countries are expected to be enrolled on courses in nuclear and related disciplines.

To promote the development of national nuclear education systems in partner countries, joint educational programmes are being implemented with foreign universities in Egypt, Bolivia, Brazil, Ghana, Turkey, Armenia, Kazakhstan, and Rwanda. 139 students were enrolled for these joint programmes in 2020.

In 2019, NRNU MEPhI opened its first overseas branch in the Republic of Uzbekistan (hereinafter referred to as the Branch) in Ulugbek near the Institute of Nuclear Physics of the Academy of Sciences of the Republic of Uzbekistan.

In 2020, the building of the Tashkent Branch was donated to NRNU MEPhI by the Uzatom Agency. The Branch obtained an extended licence for training and education from the Federal Service for the Supervision of Education and Science (Rosobrnadzor). The Tashkent Branch successfully conducted the second enrolment campaign, with more than seven applicants competing for each place. Currently, 171 people study at the Branch.

Human rights

GRI 103-1
GRI 103-2

JSC Atomenergoprom actively supports and complies with employment standards pursuant to the legislation of the Russian Federation, industry-wide and internal regulations, and the Industry-Wide Agreement on Nuclear Power, Industry and Science.

The Industry-Wide Agreement on Nuclear Power, Industry and Science and the Company's internal regulations contain no provisions barring people from being employed in the industry on the grounds of gender, ethnicity, background, the level of personal wealth, marital or social status, position, age, place of residence, attitude towards religion, political opinions or membership of public associations.

Key principles of the HR policy adopted in the industry include fairness, transparency and focus on results. Candidates are hired through a competitive process that includes interviews and tests. All employees complete special onboarding programmes. Employees are provided with opportunities for professional development and career advancement, participation in training and professional development programmes and training courses aimed at developing corporate competences throughout their employment. The Company's top priorities in the sphere of employment rights and human rights are to provide a workplace environment that poses no risks to employees' lives or health and to promote a responsible approach to occupational health and safety at all management levels.

Plans for 2021 and for the medium term

- To create an environment for continuous development;
- To shape an open culture and encourage employee involvement;
- To enable sustainable development;
- To develop a safety culture aligned with the Vision Zero paradigm;
- To improve the quality of employees' life and promote a healthy lifestyle;
- To continue to top the rankings of the best employers;
- To develop an online training system and increasing the number of employees covered by training programmes.

Developing the Regions Where Nuclear Facilities Are Located

GRI 103-1

JSC Atomenergoprom contributes to the social and economic development of the towns and cities where nuclear facilities are located in a number of ways. The Company makes a significant contribution to the energy security of a number of regions and is also a major taxpayer making tax payments to budgets of all levels. The Company makes a substantial economic impact on its regions of operation by creating a significant number of skilled jobs in the nuclear and related industries, providing not only employment, but also decent working conditions and remuneration.

Ensuring the energy security of Russian regions

Nuclear power generation accounted for 20.3% of the total electricity output (19% in 2019). If this amount of electricity was generated by conventional power generation equipment, it would produce significant greenhouse gas emissions. In fact, the Company's operations helped to prevent greenhouse gas emissions totalling 108 million tonnes of CO_2 equivalent.

Share of nuclear power generation in electricity output in integrated power systems (IPS) of Russia

	Russia	European Russia	IPS of the Centre	IPS of the Middle Volga	IPS of the North-West	IPS of the South*	IPS of the Urals	IPS of the East*
Nuclear power generation at JSC Rosenergoatom, billion kWh	215.75	204.65	103.89	30.63	37.32	32.81	10.83	0.27
Share of nuclear power generation at JSC Rosenergoatom, %	20.28	37.3	45.01	28.0	35.1	31.9	4.4	0.35

* Including isolated power systems (including Bilibino NPP and the FTNPP).

Generating employment through NPP construction

Employment in key NPP construction projects at year-end 2020

NPP	Actual headcount, including contractors	Including employees recruited from local communities
Kursk NPP-2 (Russia)	7,372	6,677
Belarusian NPP	5,909	3,250
Rooppur NPP (Bangladesh)	19,667	16,642

The construction and commissioning of nuclear facilities, including NPP power units, creates new jobs, as enterprises often hire employees from the local community. For example, as construction work progressed at Rooppur NPP, about 20,000 local residents were employed in 2020 (this is the total number of workers employed; the table shows the actual headcount at the date).

The construction of the Belarusian NPP has become a major infrastructure project providing employment to thousands of people both at the plant itself and in organisations that are servicing it. In 2020, more than 22 local building contractors were involved in the construction of the NPP.

Urban infrastructure development

In 2020, RUB 2,712.9 million was allocated from the budgets of the federal subjects of Russia for social and economic development of nuclear towns and cities. By the end of 2020, RUB 1,224.3 million had been spent by municipalities.

The first national voluntary review of Russia's progress towards achieving the Sustainable Development Goals has been published on the UN website. Among other things, the review contains information on the contribution of ROSATOM and JSC Atomenergoprom to the development of the urban environment, with the Lean Smart City, a set of state-of-the-art technological solutions implemented by JSC RIR, cited as one of the best practices.

Taxes paid by nuclear organisations, RUB million[44]

Taxes paid	2019	2020
Total, including:	207,409	249,903
Federal budget	135,430	150,473
VAT	92,528	100,887
Corporate income tax	8,993	12,178
Personal income tax	33,713	37,065
Other	196	343
Budgets of federal subjects of Russia	71,464	98,964
Corporate income tax	51,752	78,391

[44] In accordance with the Reporting Framework of ROSATOM and JSC Atomenergoprom, information on cooperation with regions and local communities in the reporting year, including data on tax payments, is disclosed only for the Russian Federation.

Taxes paid	2019	2020
Property tax	19,146	20,147
Transport tax	107	112
Other	460	314
Local budgets	514	467
Land tax	514	467
Other	0	0

Taxes accrued	2019	2020
Total, including:	174,991	215,567
Federal budget	103,407	117,274
VAT	60,538	66,430
Corporate income tax	8,807	13,704
Personal income tax	33,853	36,799
Other	208	341
Budgets of federal subjects of Russia	71,063	97,824
Corporate income tax	52,536	78,367
Property tax	17,965	19,000
Transport tax	110	116
Other	452	341
Local budgets	522	469
Land tax	522	469
Other	0	0

Implementation of agreements and funding of activities by area of expenditure

Areas	2020, RUB million	Share in total funding, %	
		2020	2013–2020
Construction/renovation of permanent structures	1,702.5	62.7	37.1
Major repairs of infrastructure facilities (housing and utilities)	18.9	0.7	6.6
Urban improvement	189.1	7.0	19.8
Major repairs of residential buildings and buildings of state-funded organisations	232.9	8.6	16.1
Support for educational, cultural, sports and healthcare programmes	99.4	3.6	6.8
Support for small and medium-sized businesses	36.8	1.4	5.0
Subsidies to the local budget	433.3	16.0	8.6
Total	**2,712.9**	**100.0**	**100.0**

GRI 203-2

JSC Atomenergoprom is implementing the Smart City project in nuclear towns and cities. The project forms part of the Housing and Urban Environment National Project and the Digital Economy National Programme. It is aimed at making Russian towns and cities more competitive, developing an effective urban management system and creating safe and comfortable living conditions for local residents.

In 2020, full-scale operation of the digital platform began in 11 towns and cities in six regions of Russia: Zheleznogorsk, Zelenogorsk (Krasnoyarsk Territory), Zarechny (Penza Region), Glazov (Udmurt Republic), Novouralsk, Lesnoy, Zarechny (Sverdlovsk Region), Snezhinsk, Tryokhgorny, Ozersk (Chelyabinsk Region) and Polarnye Zory (Murmansk Region).

GRI 102-40
GRI 102-42
GRI 102-43

8.3 Stakeholder Engagement

Key results in 2020:

- 75.2% of the population in Russia support the use of nuclear energy.
- 20 Nuclear Energy Information Centres in Russia.
- Viewership of channels broadcasting the Strana ROSATOM TV programme in various regions of Russia totals 7.3 million people.

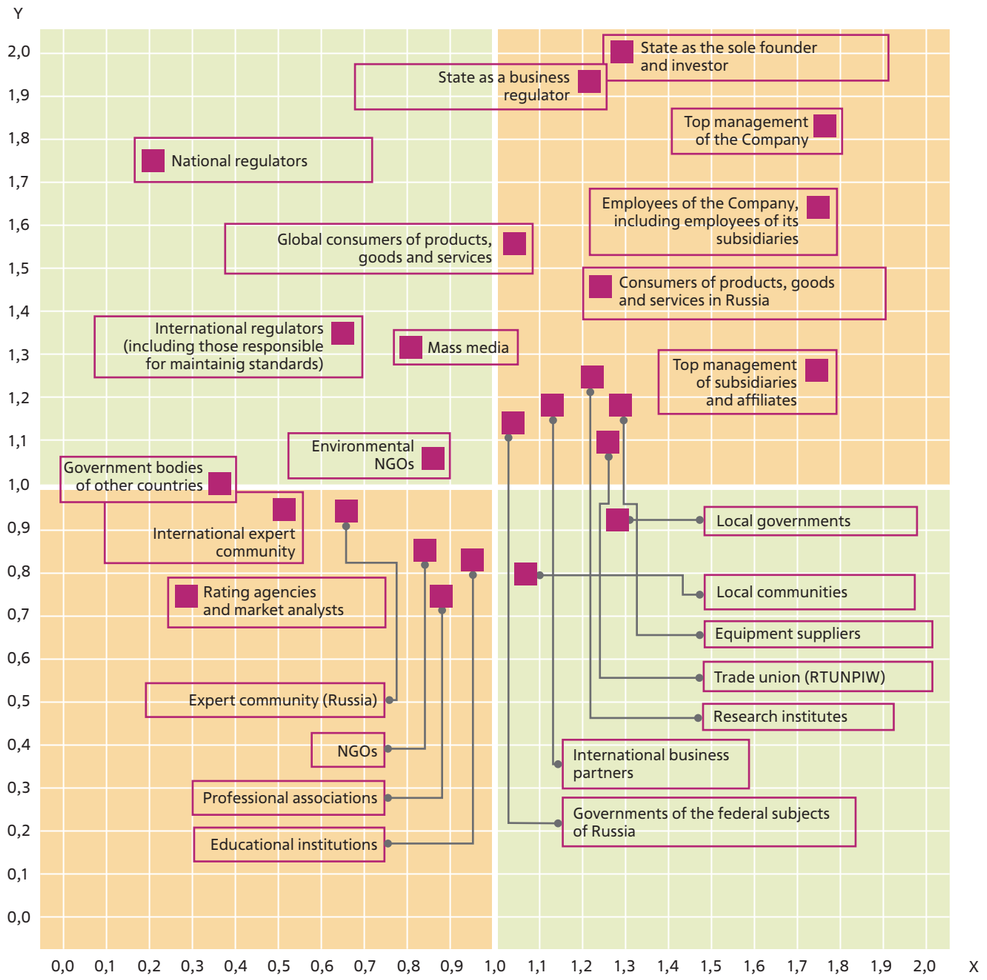
Approaches to stakeholder engagement

Due to the scale and special characteristics of its business, JSC Atomenergoprom has a wide range of stakeholders in Russia and globally. Targeted stakeholder engagement is aimed at achieving strategic goals and gaining public acceptance for nuclear power development. The Company promotes systematic and constructive stakeholder engagement across all areas of its business and conducts communication and information campaigns for the general public.

Fundamental principles underlying stakeholder engagement are as follows:

- Respect for and accommodation of the interests of all participants;
- Open and productive cooperation;
- Timely provision of complete information on the Company's activities;
- Striving to provide specific benefits to all participants;
- Fulfillment of obligations.

Stakeholder map



X — impact of the Company on the stakeholder Y — stakeholder`s impact on the Company

Nuclear Energy Information Centres[45]

The objective of Nuclear Energy Information Centres (NEICs) is to raise awareness among local communities about the operation of the nuclear industry and prospects for the development of nuclear power and radiation technologies, make professions in the industry more prestigious, promote science, innovative technologies and technical education, and cooperate with the professional scientific community in promoting science.

In 2020, the NEIC network comprised 20 centres in Russia, including the Atomarium in Sochi, as well as centres in Belarus (Minsk) and Kazakhstan (Nur-Sultan). In 2020, 110,000 people visited the centres. Due to the pandemic, the NEIC network utilised the online format. Recordings of popular science talk shows and KSTATI online science festivals gathered more than 1.5 million views in 2020.

City-wide events took place in a number of centres in 2020 when coronavirus restrictions were partially lifted. The Trolleybus of Knowledge was launched in Vladimir and Smolensk, while in Nizhny Novgorod, the MetroBrain project was launched, and a technology and art exhibition entitled 'Engineering as Art' was held to mark the 75th anniversary of the nuclear industry. The Surf Picnic town festival was held in the town of Sosnovy Bor (Leningrad Region). A festival of icebreakers was held in Saint Petersburg. Employees of the NEIC in Kursk held an outdoor town festival, AtomDvizh, while the NEICs in Zheleznogorsk (Krasnoyarsk Territory) and Rostov-on-Don organised the Science Lawn festival. The centres in Kirov, Saint Petersburg, Smolensk and Rostov-on-Don took part in the Brighter Together energy conservation festival. In addition, NEIC employees conducted the practical section of the educational programme forming part of the Vostok Youth Forum and provided communication and organisational support at the Forsazh forum for young power engineers.

As part of a special project, in 2020, the NEIC network organised a series of meetings at the Flacon Design Factory (Moscow) titled 'Atomic Fridays'. These events provided local residents and visitors with an opportunity to learn about nuclear technologies, hear the sounds of nuclear power plants and construction sites harmonised with electronic music, take part in tours titled 'Moscow through the Eyes of an Engineer', which were focused on buildings associated with science and the nuclear industry, and talk to famous scientists. In addition, in 2020, the NEICs held six KSTATI online science festivals.

During the pandemic, 14 Nuclear Energy Information Centres underwent renovation, which involved comprehensive repairs of the centres' facilities and replacement of equipment. This will help to modernise communication with visitors to the centres and transform the NEIC network into an integrated inter-regional digital platform that brings together people who are passionate about science and technology and have a positive attitude toward the nuclear industry.

[45] http://www.myatom.ru.

Highlight of the year: the 75th anniversary of the nuclear industry

2020 marked the 75th anniversary of the Russian nuclear industry. The programme of anniversary celebrations under the motto '75 Years: Ahead of the Times' was launched on 20 August 2020 and continued until the end of the year.

During this time, more than 200 events of different formats and scale were held, both offline and online. All events were held taking into account the epidemiological situation in the country and globally: after restrictions were imposed, some of the events on the anniversary programme were held online or in a mixed format. The programme included a wide variety of awareness-raising, educational and cultural projects, ranging from photo exhibitions at specialised universities and articles on scientific portals to contests on social media and animated series.

Media projects. Special projects, including tests, quizzes and in-depth feature articles about the present, past and future of the nuclear industry, were published on various media platforms. This included the publication of detailed guides to various areas of atomic science on the PostNauka portal, *Andrey Sakharov's Rules of Life* in the *Arzamas* online magazine, a special project by RBC titled 'People and Atoms', a photo project by TASS to mark the 75th anniversary of the industry, broadcasts on the Echo of Moscow and Silver Rain radio stations, and other projects.

Cultural events. The anniversary campaign kicked off with a large-scale online event, ROSATOM's House Concert, hosted by atom75.ru and featuring performances by the Turetsky Choir and the Soprano Art Group. On 20 August, a monument to Efim Slavsky, the Minister of Medium Machine-Building, was unveiled in front of ROSATOM's headquarters in Moscow; memorial plaques to famous Soviet nuclear scientists were unveiled in Moscow and the regions; medals in honour of the 75th anniversary of the Russian nuclear industry were presented; and veterans and honoured employees were awarded.

The Sovremennik Theatre, the Helikon Opera, the Moscow Drama Theatre of Armen Dzhigarkhanyan and the School of Modern Drama successfully toured in nuclear towns and cities. The audience was shown plays about the atomic project, as well as programmes, documentaries and stories about the history of the nuclear industry, its achievements and promising technologies.

In November, a miniseries titled *The Bomb* was premiered on the Russia 1 channel and became one of the highlights of the TV season. The series was directed by Igor Kopylov and focused on the scientists who worked on the Soviet atomic project.

Campaigns in the industry. As part of a project titled 'The Story of a Photo', the Company's employees shared photos of people involved in the development of the Russian nuclear industry on the portal at https://atomphoto.ru/media/. Participants of the ATOM IS HERE contest made videos about nuclear technology in everyday life: about 5,000 videos were submitted, and 850 winners went on tours in nuclear towns and cities.

Sporting events. All of the Company's employees were offered an opportunity to take part in an online running marathon marking the anniversary; in addition, a nation-wide intellectual running race, Running Book 2020, was held to celebrate the 75th anniversary of the nuclear industry.

Events in Moscow and regions. On 15 September, the first-ever 'atomic train' was launched on the Circle Line of the Moscow Metro, showcasing the most important milestones in the history of the nuclear industry and its key achievements. Thematic photo exhibitions were organised on boulevards in the centre of Moscow, in the core universities, at ROSATOM's headquarters and in a number of nuclear enterprises.

The Federal Communications Agency issued a commemorative stamp depicting representatives of various professions in the nuclear industry against the backdrop of the industry's achievements: RDS-1, the world's first nuclear power plant in Obninsk and the Lenin nuclear icebreaker.

On 28 September, the Roll Call of Nuclear Towns and Cities was held to mark the Nuclear Industry Worker's Day; this event entered the Russian Book of Records. This was a teleconference on a federal channel linking 25 nuclear towns and cities and the central studio in Moscow. On 28 September, the Icebreaker of Knowledge contest for year 7 to 10 school students and first-year university students was launched with support from ROSATOM, with almost 30,000 teenagers competing in it; the finalists will go on an expedition to the North Pole on a nuclear icebreaker in 2021.

Educational and awareness-raising projects. Entertaining projects for schoolchildren and students showcasing nuclear technology included the nation-wide Atomic Lesson, which was held in many schools across the country. Animated films for children and young people were released, including a special episode of *The Fixies*; a series about a blogger, *#Vasyaatomnydvizh*; the *Nuclear Pass* animated series. A special project titled 'Atomic Moscow through the Eyes of an Engineer' included walking and virtual tours of places of interest to nuclear engineers in Moscow, a series of public lectures and thematic AtomTalks for students and young people.

Popular science projects. Highlights of the programme marking the 75th anniversary of the nuclear industry included the NEXT 75 International Youth Conference held on 16 December 2020. It involved a dialogue between famous scientists and the young generation from five continents focused on global problems and challenges facing humanity and the future of the planet.

The reach of media coverage of the 75th anniversary totalled more than 300 million contacts in the Russian Federation and beyond.

ATOMEXPO International Forum

The ATOMEXPO International Forum is the main event in the global nuclear industry. The Forum has been held annually since 2009 and is the largest exhibition and business platform for discussing the current state of the nuclear industry and setting future trends.

The Forum is attended by executives of key companies in the global nuclear industry, government agencies, international and non-governmental organisations, as well as leading experts.

In 2020, it was decided to postpone the 12th Forum until 2021 due to COVID-related restrictions imposed in the reporting year.

Industry media

To inform employees and other stakeholders about news and key events in the Russian nuclear industry, a range of corporate media outlets operates under the common brand name *Strana ROSATOM* ('The Country of ROSATOM'):

- A newspaper (published weekly in all enterprises in the Russian nuclear industry, with a circulation of 59,000 copies and a readership of more than 250,000 people);
- A TV programme (aired weekly in 20 towns and cities where nuclear organisations operate; the viewership of the channels broadcasting the programme totals 7.3 million people).

In 2021, the Company plans to broadcast weekly programmes in 24 nuclear towns and cities, with the viewership of the channels broadcasting the programme expected to total 12.18 million people.

Nuclear Kids

Nuclear Kids (NucKids) (http://www.nuckids.ru/) is an annual international charitable art project for children from nuclear towns and cities across Russia, as well as children of employees of overseas nuclear enterprises partnered with the Company. Since its launch, the project has covered 22 countries. Many NucKids alumni study and work at famous universities, such as the Russian Institute of Theatre Arts (GITIS), the Moscow Art Theatre School, the Russian State University of Cinematography (VGIK), the Oleg Tabakov Studio and the Sergey Zhenovach Theatre Art Studio. They perform in films and work in show business.

In 2020, amid a worldwide pandemic, a project was launched online with a total of 112 participants from Russia, Hungary, India, Belarus and Uzbekistan. In August 2020, 67 participants from Russia continued to participate in the project in its traditional format: under the supervision of professional choreographers, directors, voice coaches and singing teachers, a full-length feature film was shot and a musical titled *Once Upon a Time in the Future* was simultaneously produced and presented to the audience on the main stage of the Et Cetera Theatre in Moscow directed by Alexander Kalyagin. The central themes of the musical were based on William Shakespeare's tragedy *Romeo and Juliet*, with the story set in the future. Three sets of cast members were trained for the musical, and four performances were given

GRI 103-1

Opinion polls

JSC Atomenergoprom analyses the public perception of the development of nuclear power in Russia on an annual basis and adjusts its communication with stakeholders accordingly.

According to an independent opinion survey by the Levada-Centre[46], 75.2% of the Russian population supported the use of nuclear power (73.7% in 2019; over the past few years, the figure has remained consistently high).

— Do you think that nuclear power should be actively developed, maintained at the current level, phased out or completely abandoned	
Actively developed	51.8%
Maintained at the current level	23.4%
Phased out	5.6%
Completely abandoned	8.5%
I do not know	10.7%

— Do you agree with the following statement: 'Nuclear power is a "green", environmentally friendly type of power generation'?	
I completely agree	19.7%
I partly agree	36.9%
I partly disagree	20.5%
I completely disagree	12.7%
I do not know	10.2%

[46] The survey was conducted on 16-24 February 2021 across a representative sample of the Russian population consisting of 3,922 people aged 18 and older.

CHAPTER 9

SAFE OPERATION

GRI 102-44

9.1 Nuclear and Radiation Safety; Occupational Safety and Health

Key results in 2020:

- There were no events rated at level 1 or higher on the INES scale.
- The injury frequency rate and the lost time injury frequency rate (LTIFR) stood at 0.18 and 0.09 respectively.
- Individual radiation risk was calculated for 39,821 people using the IRAW system.

GRI 103-1
GRI 103-2

JSC Atomenergoprom focuses on the effective exercise of powers and performance of functions related to managing the use of nuclear energy, as determined by law, with a special focus on safety and environmental protection during the use of nuclear energy. This task is performed by various organisations and divisions of the Company using all key management mechanisms.

Nuclear and radiation safety management functions are performed by the following divisions:

- The Nuclear and Radiation Safety, Licensing and Permitting Department ensures that personnel and equipment are ready to respond to emergencies at nuclear facilities and monitors the implementation of emergency prevention measures;
- The Technical Regulation Department updates the system of technical specifications for the safe use of nuclear energy;
- The General Inspectorate ensures nuclear and radiation safety when organisations use nuclear energy for peaceful purposes.

Nuclear and radiation safety at nuclear facilities

In 2020, the Company ensured safe and steady operation of nuclear enterprises. There were no incidents involving radiation leaks. Limits on employee radiation exposure were not exceeded.

Over the years, no events rated at level 1 or higher on the international INES scale have been detected at Russian nuclear power plants[47].

In 2020, there were 24 deviations rated at level 0. JSC Rosenergoatom Concern performed a thorough analysis of all deviations. Their causes were identified: most of the deviations were caused by failures of thermal and electrical equipment due to manufacturing defects which had not been detected during the installation and adjustment of the equipment. In accordance with the INES Scale User's Manual, the Company rated each event that had occurred and developed corrective measures to prevent similar failures in the future. This approach helped to reduce the number of deviations in the operation of nuclear power plants in 2020.

Changes in the number of deviations in NPP operation according to the INES scale

	2017	2018	2019	2020
Total, including	33	42	38	24
Level 0 and out of scale	33	40	38	24
Level 1	0	2	0	0

Physical protection of nuclear facilities

GRI 103-2

The security and physical protection of nuclear facilities posing nuclear and radiation hazards and of nuclear and radioactive materials used and stored by the Company, including during their transportation, complies with Russian legislation and the Convention on the Physical Protection of Nuclear Material and is aligned with the recommendations of the International Atomic Energy Agency.

The main mechanisms for ensuring physical protection and anti-terrorism security are as follows:

- Monitoring of the physical protection and anti-terrorism security of facilities (premises) by the relevant departments;
- Ensuring the reliable operation of existing physical protection and security equipment at facilities, as well as its scheduled modernisation and improvement;
- Strict compliance with the requirements of federal and industry-wide regulations.

[47] Level 1 and 0 deviations do not pose a risk to employees operating the facilities, the local population or the environment.

As part of departmental monitoring, in accordance with the Consolidated Plan of Inspection Activities, a number of inspections of the physical protection of nuclear materials, nuclear facilities and nuclear material storage sites were conducted in 2020 in JSC Atomenergoprom's organisations (JSC Electrochemical Plant, JSC Siberian Chemical Plant, JSC N.A. Dollezhal Research and Development Institute of Power Engineering), including inspections of their anti-terrorism security status.

In the context of measures taken to prevent the entry and spread of the new coronavirus infection (COVID-19), targeted inspections forming part of departmental monitoring in JSC Electrochemical Plant, JSC Siberian Chemical Plant and JSC N.A. Dollezhal Research and Development Institute of Power Engineering did not involve site visits by the Company's employees; instead, they were conducted by security specialists of these organisations.

The findings of all inspections were documented in reports; progress on measures to eliminate the deficiencies identified in the course of inspections and implement the recommendations from the commissions is being monitored.

Measures taken in cooperation with the Federal Security Service of Russia, the Federal National Guard Service and the Ministry of Internal Affairs of Russia made it possible to prevent unlawful acts against nuclear facilities.

In 2020, there were no violations of access control or internal security regulations at the Company's facilities resulting in the theft of nuclear materials, terrorist acts or sabotage at nuclear facilities.

Industry-Wide Radiation Monitoring System

GRI 103-2

The Industry-Wide Radiation Monitoring System (IRMS) is in operation in the Russian nuclear industry; it is a functional subsystem of the Integrated State Automated Radiation Monitoring System in Russia.

In 2020, the IRMS included:

- 296 fixed stations forming part of the industry-wide automated radiation monitoring system (IARMS);
- 1,676 on-site subsoil condition monitoring (OSCM) wells;
- 211 air quality monitoring stations;
- 175 atmospheric precipitation monitoring stations;
- 549 stations monitoring surface water bodies;
- 143 stations monitoring bottom sediments;
- 342 soil monitoring stations;
- 280 ground vegetation monitoring stations;
- 72 stations monitoring algae and aquatic organisms;
- 253 stations monitoring the snow cover;
- 164 stations monitoring food products;
- 130 absorbed dose monitoring stations;
- 808 stations monitoring the gamma radiation exposure dose rate (EDR) that are not part of the IARMS;
- 110 stations monitoring surface contamination with alpha and beta particles;
- 118 monitoring routes where the EDR and contamination with alpha and beta particles are measured.

In 2020, radiation levels in the areas where nuclear organisations are located were within the range of natural background radiation.

Real-time data from automated radiation monitoring stations is available on the website at http://www.russianatom.ru

Emergency preparedness

GRI 103-1
GRI 103-2

In order to ensure the safe operation of the nuclear industry and protect employees, the local population and areas against the possible impacts of accidents (emergencies), nuclear organisations operate an emergency prevention and response system (EPRS), which is a functional subsystem forming part of the integrated state system for emergency prevention and response (ISSEPR).

As at 31 December 2020, 14 professional and 63 volunteer emergency response teams had undergone certification and were in a state of readiness in the Company. They comprise a total of 2,297 emergency response workers. 369 operational training exercises were conducted in 2020, including 8 command post exercises, 12 special tactical exercises, 7 tabletop exercises and 173 emergency drills.

In 2020, the needs of enterprises and organisations in the industry for special cargo transportation were fully met. All shipments of nuclear materials fully complied with established requirements. An industry-wide automated system for safe transportation of radioactive substances (ASST-RS) was deployed. Work was continued to produce and upgrade special vehicles and equip them with modern automated security systems.

Occupational safety and health

GRI 103-1
GRI 103-2
GRI 403-1

One of the fundamental priorities for JSC Atomenergoprom is to protect the life and health of employees in the industry. Internal regulations adopted in the Company and its organisations (primarily the Uniform Industry-Wide Policy on Occupational Safety and Health) are aimed at preventing workplace accidents and occupational diseases, systematically monitoring working conditions and occupational safety performance, ensuring the safety and protecting the health not only of the Company's employees, but also of employees of contractors and subcontractors involved in the operation of nuclear facilities.

GRI 403-2

In 2020, the Uniform Industry-Wide Guidelines for Occupational Risk Management in Nuclear Organisations were put into effect as part of the industry-wide occupational health and safety management system. This document is aimed at identifying workplace hazards, assessing occupational risk levels and developing corrective measures to reduce occupational risks.

GRI 102-12

In 2019, the Russian nuclear industry joined the Vision Zero international campaign to achieve a zero occupational injury rate in its organisations.

In 2020, a total of six people were injured in contractor organisations (including two serious injuries; there were no fatalities).

GRI 403-9

The relatively low injury rate in contractor organisations is determined not only by cooperation between the occupational safety functions of customer organisations and contractors, but also by stricter safety requirements for contractors performing work at the production sites in the industry.

GRI 103-3

Analysis of accident investigation records showed that the main causes of accidents included inadequate work organisation and violation of safety requirements and occupational safety instructions by the victims. This was due to shortcomings in the work of the management team during the preparatory phase of the work:

- Poor quality of designs and technical documentation (lack of a sufficient list of health and safety requirements);
- Poor preparation of workplaces;
- Failure to comply with operational procedures;
- Shift assignments being issued without due regard to all safety requirements;
- Lack of executive supervision of work;
- Inadequate personnel training.

Radiation exposure of employees

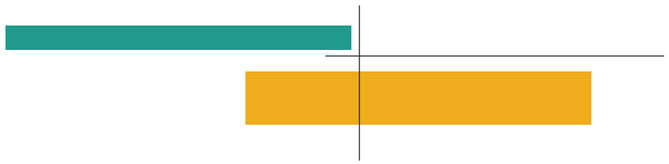
GRI 403-10

Radiation safety criteria for personnel are laid down in the Radiation Safety Standards (NRB-99/2009), the Basic Sanitary Rules of Radiation Safety (OSPORB-99/2010) and other regulations. Most enterprises in the industry provide workplace conditions that fully meet the requirements set out in these documents.

In 2020, the average annual effective radiation dose for the Company's employees totalled 1.47 mSv. Over the past 10 years, the average effective dose, the structure of personnel exposure and the number of employees exposed to radiation have been varying insignificantly and remain low. The annual exposure limit of 50 mSv was not exceeded.

In 2020, the Company continued to monitor radiation risks for group A personnel using the IRAW (individual risk assessment workstation) occupational radiation risk assessment system. Individual risk was calculated for 39,821 people. The vast majority of group A employees work in the conditions of acceptable occupational risk. For 628 people (1.58% of the total number of employees included in the IRAW system), individual risk exceeded the standard value of 10-3. The high-risk group comprises mainly industry veterans, whose average age exceeds 60 years.

In 2020, the average individual radiation risk across the Company stood at 7.3·10-5. Over the past three years, the average individual radiation risk across JSC Atomenergoprom has not exceeded 8% of the standard value, and the maximum individual risk has been decreasing steadily.



GRI 102-11

9.2 Environmental Safety

Environmental safety and environmental protection management

GRI 103-1

The environmental footprint of the nuclear power industry is substantially smaller than that of carbon-based power generation using fossil fuels. Nuclear power generation produces virtually no emissions of hazardous chemicals into the atmosphere, including those that destroy the ozone layer or contribute to the greenhouse effect.

JSC Atomenergoprom and its organisations operate responsibly in accordance with the following principles:

- Giving priority to preserving natural ecosystems;
- Making use of the latest scientific achievements and ensuring environmental safety as a mandatory requirement;
- Ensuring transparency and making information about the environmental aspects of operations publicly available.

The goals and initiatives of ROSATOM and JSC Atomenergoprom in the field of environmental safety and environmental protection are stipulated in the Uniform Industry-Wide Environmental Policy.

GRI 103-2

An important tool for the implementation of the environmental policy is a three-year Comprehensive Implementation Plan. In 2019, the Company approved the Comprehensive Plan for the period from 2019 through 2021, which includes organisational, operational and technical measures to be implemented by organisations in the Russian nuclear industry.

In order to improve environmental safety and the efficiency of environmental protection measures, environmental management, quality management, occupational health and safety management and energy management systems are being implemented in environmentally relevant organisations.

Financing of environmental measures

In 2020, environmental expenses in the nuclear industry totalled RUB 26.93 billion, including expenditure on environmental measures totalling RUB 19.60 billion and fixed asset investment totalling RUB 7.33 billion.

Environmental costs increased by RUB 3.38 billion year on year. The increase in expenditure on environmental measures was due to an increase in current costs related to wastewater collection and treatment at Novovoronezh NPP.

Environmental costs, RUB billion

	2018	2019	2020
Expenditure on environmental measures	15.44	17.30	19.60
Fixed asset investment	8.80	6.25	7.33
Total	**24.24**	**23.55**	**26.93**

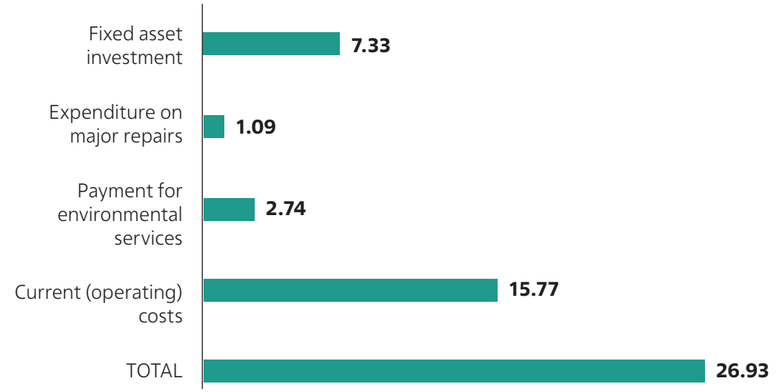
The largest portion of expenditure on environmental measures was allocated for radiation safety (45.3%), wastewater collection and treatment (23.7%), industrial and consumer waste management (15.0%), protection of the atmosphere and climate change prevention (7.5%).

A major part of fixed asset investment was allocated for the protection of the atmosphere (59.8%) and the protection and sustainable use of water resources (22.2%).

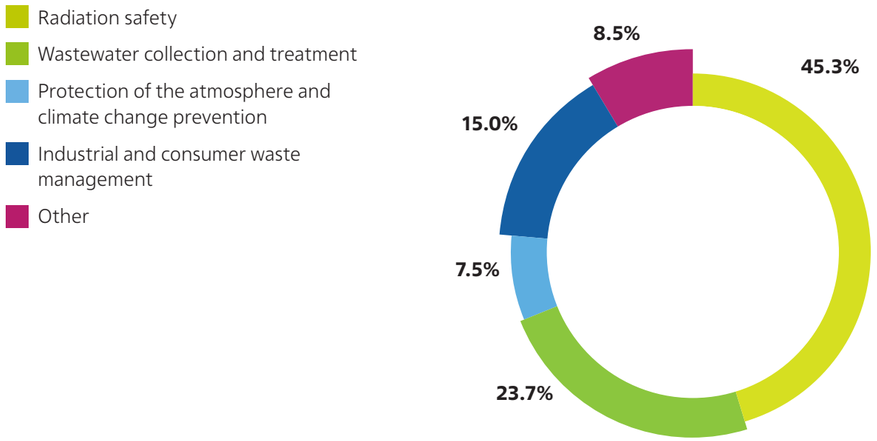
The branches of JSC Rosenergoatom account for 72.5% of the total fixed asset investments made by nuclear organisations for environmental purposes (RUB 5.32 billion). Nuclear organisations account for 4.2%[48] of the total volume of investments in the Russian Federation.

[48] Calculated based on data provided in the Government Report on the Status and Protection of the Environment of the Russian Federation in 2019.

Environmental cost structure in 2020, RUB billion



Structure of expenditure on environmental measures in 2020



Environmental charges and fines

In 2020, charges for the negative environmental impact totalled RUB 75.5 million, including charges for allowable emissions and discharges of pollutants and disposal of industrial and consumer waste totalling RUB 35.1 million (46.5%), and charges for excess emissions and discharges totalling RUB 40.4 million (53.5%).

Payment amount, RUB million

	2018	2019	2020
Charges for allowable emissions (discharges) of pollutants (disposal of industrial and consumer waste), total including:	33.7	34.0	35.1
into water bodies	7.3	6.0	3.2
into the atmosphere	2.9	3.1	3.1
for the disposal of industrial and consumer waste	23.5	24.9	28.8
Charges for excess emissions (discharges) of pollutants (disposal of industrial and consumer waste), total including:	51.9	21.0	40.4
into water bodies	13.4	5.7	15.1
into the atmosphere	22.7	8.8	13.9
for the disposal of industrial and consumer waste	15.8	6.5	11.4
Charges for allowable and excess emissions (discharges) of pollutants (disposal of industrial and consumer waste), total	**85.6**	**55.0**	**75.5**

GRI 103-3

In 2020, government watchdogs on natural resource management detected minor violations in certain organisations in the industry, for which they imposed administrative penalties in the form of fines totalling RUB 3.9 million. The violations detected by the government watchdogs did not necessitate restrictions on production or business operations of the organisations and did not cause any harm to the environment.

GRI 307-1

The number of administrative violations detected during the reporting period remained the same as in 2019 (36 violations per year), but due to the tightening of requirements in the field of environmental protection and environmental management, the total amount of fines increased by RUB 1.7 million. At the same time, it should be noted that government watchdogs on natural resource management did not require nuclear organisations to repair environmental damage; no non-financial sanctions were imposed on the Company or its organisations in 2020 for non-compliance with environmental legislation and regulatory requirements in the field of environmental protection; there was no need for the use of dispute resolution mechanisms.

GRI 305-7

Pollutant emissions into the atmosphere

In 2020, pollutant emissions into the atmosphere amounted to 38,000 tonnes; the pollutant capture rate reached 89.7%. Nuclear organisations accounted for 0.2% of the total volume of emissions in the Russian Federation in 2020.

Pollutant emissions into the atmosphere[49], '000 tonnes

	2018	2019	2020
Total (excluding CO_2), including:	39.9	38.6	38.0
Particulate matter	13.8	13.4	14.2
NOx emissions	10.6	10.2	6.1
SO2 emissions	9.4	9.7	11.6
CO emissions	3.7	3.5	3.3
Hydrocarbon emissions, including:	1.7	1.4	2.2
Methane emissions	0.2	0.2	0.8
Volatile organic compounds	1.2	1.1	1.2
Other gaseous and liquid compounds	0.7	0.4	0.6

Pollutant emissions into the atmosphere decreased by 600 tonnes compared to 2019 due to a reduction in fuel combustion at thermal power plants (CHPPs), which produce electricity and heat for the needs of both the Company's organisations and the towns and cities in which they are located. Significant changes in sulphur dioxide and nitrogen oxide emissions were due to a shift to different types of fuel at the CHPPs.

GRI 305-6

Emissions of major ozone-depleting substances, tonnes of chlorofluorocarbon-11 equivalent[50]

Substance	2018	2019	2020
Dichlorodifluoromethane (Freon 12)	75.04	72.24	72.24
Chlorodifluoromethane (Freon 22)	0.19	0.21	0.09
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.00	0.00	0.00
Chlorotrifluoromethane (Freon 13)	164.21	164.21	164.21
Tetrafluoromethane (Freon 14)	6.24	6.24	6.24
Total	**245.68**	**242.90**	**242.78**

Emissions of ozone-depleting substances decreased in 2020 as a result of a decrease in chlorodifluoromethane emissions at JSC Electrochemical Plant due to a reduction in the capacity of refrigeration equipment.

[49] Pollutant emissions are reported by the Company's organisations using chemical analysis methods or automatic gas analysers.

[50] The data are presented taking into account the ozone depletion potential of substances under the Montreal Protocol on Substances that Deplete the Ozone Layer.

Initiatives to reduce harmful emissions into the air

In order to reduce pollutant emissions into the atmosphere by nuclear organisations, in 2017, the Company developed a Plan of High-Priority Measures to Reduce the Negative Impact of Nuclear Organisations on the Environment until 2020. Key measures implemented as part of this plan included the following:

- JSC Research Institute of Scientific Instruments (RISI) upgraded the system for treating air emissions from the chemical milling section, which enabled a 20% reduction in pollutant emissions into the atmosphere;
- Electrical equipment was upgraded at power unit No. 3 of Kursk NPP, which made it possible to decommission the air compressor station and reduce emissions of mineral oil aerosols from compressors by 0.07 tonnes per year;
- Two oil-filled transformers were replaced with dry-type transformers at JSC CNIITMASH, which reduces the risk of transformer oil spills and evaporation into the atmosphere;
- The ash collector of a boiler unit was replaced in the Krasnokamensk branch of JSC RIR, which helped to reduce particulate matter emissions into the atmosphere.

Greenhouse gas emissions

GRI 103-1

Climate change is recognised as one of the biggest problems facing the international community, businesses and citizens. The Russian government has ratified the Paris Agreement on Climate Change, whereby the participating countries take on a commitment to reduce greenhouse gas emissions.

GRI 103-2

In order to meet the international legal commitments of the Russian Federation on climate and minimise risks associated with the operations of ROSATOM and JSC Atomenergoprom, a greenhouse gas emissions accounting system is being developed in the Russian nuclear industry:

- In 2019, a framework high-level document was developed and approved: the Regulations on a System for Accounting for Greenhouse Gas Emissions Generated by the Operations of Organisations in the Russian Nuclear Industry;
- In 2020, the Uniform Industry-Wide Guidelines for Accounting for Greenhouse Gas Emissions from Nuclear Organisations were developed.

In 2020, gross greenhouse gas emissions totalled 6,095.43 tonnes, up by 5.6% year on year. This change was due to the recalculation of emissions from the Company's waste disposal facilities in accordance with the methodology for quantifying pollutant emissions from solid domestic and industrial waste landfills.

Gross greenhouse gas emissions by nuclear organisations, tonnes[51]

Substance	2018	2019	2020
Carbon dioxide[52]	5,802.284	5,451.820	5,204.008
Methane	239.72	193.734	766.619
Nitrous oxide	0	0	0
Trifluoromethane	0	0	0
Perfluoromethane	124.806	124.806	124.806
Perfluoroethane	0	0	0
Sulphur hexafluoride	0	0	0
Total	**6,166.810**	**5,770.360**	**6,095.433**

Nuclear organisations accounted for 0.04% of total greenhouse gas emissions in Russia (in tonnes of CO_2 equivalent).

Impact on local flora and fauna

GRI 103-1

The high quality of the natural environment is a vital prerequisite for the existence of mankind on Earth. Global environmental problems, such as the greenhouse effect and associated irreversible climate change, the depletion of the ozone layer and a rising level of toxic substances in the environment, ultimately lead to a reduction of biodiversity on the planet.

In terms of environmental performance, nuclear power is much more attractive than thermal power, since nuclear power plants consume no oxygen and emit no harmful chemicals into the atmosphere, which affect living organisms, including humans. At the same time, the nuclear industry, and primarily nuclear power plants, are subjected to close scrutiny by various environmental organisations, the general public and the media due to the potential radiation impact of nuclear power plants on the environment.

[51] Quantitative estimates of greenhouse gas emissions are based on data obtained from statistical observation forms 2-TP (air).
[52] The data are presented using a coefficient of 1.57 calculated by converting CO to CO2 based on molar mass.

GRI 103-2

In the Russian Federation, there are currently no criteria for quantitative assessment of the radiation impact on flora and fauna, and in the vast majority of cases the assessment of such impacts is viewed as supplementary to the setting of hygienic standards.

Nuclear organisations operating nuclear facilities regularly monitor radionuclide content in local agricultural products, wild-growing foods (berries, mushrooms, etc.) and fodder growing in radiation control areas, as well as in fish and other aquatic organisms living in cooling ponds at NPPs. The specific activity of dose-forming radionuclides is monitored in food products. Regional offices of the Russian Federal Biomedical Agency (FMBA) conduct independent radiation monitoring of the environment and locally produced food; radiation monitoring of abiotic components of the environment is carried out by the Federal Service for Hydrometeorology and Environmental Monitoring (Roshydromet).

GRI 103-3

The results of long-term radiation monitoring show that the content of radioactive substances in various types of crops corresponds to the background radiation level, that the species composition of flora and fauna is practically unchanged, with no hazards that can affect their existence, and that the growth rate of the amount of dead wood is within permissible limits.

In addition, the close proximity of NPPs to nature reserves also provides evidence of biodiversity conservation at their locations. The Lapland State Nature Reserve is located within a 30-kilometre radius of Kola NPP, and 16 nature monuments and 33 wildlife sanctuaries are located within a 30-kilometre radius of Kalinin NPP. This shows that the radiation impact of nuclear technologies and production facilities on the natural environment poses no danger to living organisms or their habitat and, accordingly, cannot be assessed as negative.

GRI 304-3

All organisations in the nuclear industry take measures to prevent the degradation of natural ecosystems as a result of their operations. Measures aimed at preserving the diversity of flora and fauna include the following:

- Equipping tailings ponds with bird deterrents to prevent birds from landing on the water surface;
- Equipping water intake facilities with fish screens in order to prevent young fish from swimming or getting drawn into them;
- Equipping transformer substations, their components and operating mechanisms with special devices (fences, casings, etc.) to prevent animals from entering the premises of the substation and getting into these units and mechanisms;
- Installing bird diverters on power lines;
- Maintaining fences along the perimeter of industrial sites in good condition, including in order to prevent animals from entering the premises;
- Ensuring that motor vehicles and special machinery travel on paved roads and providing special parking lots for them;
- Using machines and mechanisms that are in good condition, with adjusted fuel fittings preventing losses of fuel and lubricants and their spills onto the ground and vegetation;
- Measures to protect the atmosphere;
- Arranging waste accumulation sites compliant with technical and sanitary standards; removing waste and transporting it to designated locations in a timely manner;
- Implementing fire prevention measures to ensure that industrial sites comply with fire safety requirements;
- Measures to provide protection against noise exposure (using equipment that is less noisy; more effective soundproofing, etc.);
- Lighting of industrial sites at night.

Restoration of disturbed land

In 2020, the area of disturbed land in nuclear organisations totalled 6,600 hectares.

Breakdown by type of operations that caused land disturbance in 2020, ‘000 hectares

Development of mineral deposits	3.5
Construction work	2.2
Disposal of industrial waste (including construction waste) and solid household waste	0.8
Survey work	0.0038
Other operations	0.0969

In 2020, nuclear organisations implemented a set of measures to restore the productivity and economic value of disturbed lands and improve the environment. In the reporting year, the area of rehabilitated (restored) land totalled 37.05 hectares. In 2020, no land was reclaimed for forest plantations, and no reforestation activities were carried out in the Company’s organisations.

Land rehabilitation in nuclear organisations, hectares

Organisation	2018	2019	2020
JSC Lunnoye	0.20	10.76	0.00
JSC ZIO-Podolsk	0.06	0.07	0.04
JSC Siberian Chemical Plant	4.80	11.30	32.9
Other	4.51	7.13	4.11
Total[53]	**9.57**	**29.52**	**37.05**

The increase in the area of restored land was due to the completion of mothballing of nuclear legacy facilities at JSC Siberian Chemical Plant.

Industrial and consumer waste management

In 2020, nuclear organisations generated 30.9 million tonnes of industrial and consumer waste, which is 6.1 million tonnes (24.6%) more than in 2019. 99.97% of the generated waste is hazard class 4 and 5 waste (low-hazard and virtually non-hazardous waste). At the same time, industrial and consumer waste generated in nuclear organisations accounted for 0.4% of the total volume of waste generation in Russia in 2020[54].

Most of the waste (22.3 million tonnes) was generated at PJSC PIMCU. Most of it is class 5 waste, which is the least hazardous.

A significant increase in the volume of waste generated in 2020 was due to an increase in the amount of rock and loose overburden produced at JSC Lunnoye and PJSC PIMCU.

The weight of the transferred waste totalled 198,300 tonnes, including 30,300 tonnes of solid household waste transferred to the regional operator. 79.9% of the total amount of waste generated and received by the Company's organisations was recycled, and 0.003% was treated.

[53] Taking into account the indicators of ROSATOM.
[54] Calculated based on data provided in the Government Report on the Status and Protection of the Environment of the Russian Federation in 2018.

Industrial and consumer waste management, '000 tonnes GRI 306-2

Year	Amount at the beginning of the reporting year	Waste generated and received during the year	Recycling and treatment of generated and received waste		Transferred to third-party organisations	Storage in enterprises	Amount at the end of the reporting year
			Amount	%			
2018	403,891.9	20,862.3	15,140.3	72.6	176.4	5,565.3	403,872.2
2019	408,868.7	24,782.2	19,120.7	77.2	2,138.7	2,332.7	412,391.5
2020	412,117.463	30,926.345	24,696.353	79.9	198.332	6,033.646	413,886.344

In 2020, JSC Atomenergoprom did not transport, import, export or process waste classified as 'hazardous' according to Annexes I, II, III, and VIII of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. GRI 306-4

Industrial and consumer waste management[55] by hazard class in 2020, '000 tonnes GRI 306-2

Waste hazard class	Waste amount as at 1 January 2020	Waste generated and received in the reporting year	Recycling of generated and received waste		Treatment generated and received waste		Transfer of waste to third-party organisations	Waste storage at the sites operated by the Company in the reporting year, '000 tonnes		Amount in enterprises as at 31 December 2020
			'000 tonnes	%	'000 tonnes	%		Total	Including burial	
1	0.022	0.253	0.000	0.0	0.000	0.0	0.255	0.00002	0.000	0.020
2	0.038	1.157	0.0002	0.02	0.789	68.2	0.339	0.000	0.000	0.067
3	3.943	6.546	0.006	0.1	0.008	0.1	8.723	0.00002	0.00002	1.752
4	24.203	78.847	0.006	0.01	0.025	0.03	73.954	5.202	1.628	27.438
5	412,089.257	30,839.542	24,695.519	80.1	0.000	0.0	115.061	6,028.444	4,261.138	413,857.067
TOTAL	**412,117.463**	**30,926.345**	**24,695.531**	**79.9**	**0.822**	**0.003**	**198.332**	**6,033.646**	**4,262.766**	**413,886.344**

[55] As from 1 January 2015, the term 'use' as a type of industrial and consumer waste management was legally replaced by the term 'recycling'; however, the scope of the concept has not changed. According to the definition given in Article 1 of Law No. 89-FZ, recycling is the use of waste for the manufacture of goods (products), performance of work and provision of services. According to this definition, reprocessing and reuse are waste recycling options.

GRI 303-1

Water use

The nuclear industry is a major water user. In 2020, water withdrawal from natural sources by JSC Atomenergoprom's organisations made up 9.3% of the total water withdrawal in the Russian Federation. The main consumers of water among the Company's organisations and enterprises are Leningrad NPP and Kola NPP (81.9% of the total water withdrawal).

In the reporting year, water withdrawal by nuclear organisations totalled 6,059.2 million m³, which is 472.1 million m³ less than in 2019. The decrease was mainly due to a reduction in seawater withdrawal at Leningrad NPP due to a decrease in electricity generation.

GRI 303-3

Total water withdrawal, million m³

Source	2018	2019	2020
Seawater	4,979.7	4,215.1	3,772.7
Fresh surface water, including rivers, marshes and lakes	2,219.7	2,203.5	2,191.2
Groundwater	100.4	96.9	77.5
Rainwater	2.0	2.0	2.4
Water from third-party organisations	16.0	13.8	15.4
Total	7,317.8	6,531.3	6,059.2

Volume of recycled and reused water

	2018	2019	2020
Total volume of recycled and reused water, million m³	34,740.0	35,096.7	36,300.9
Water withdrawal, million m³ (% of recycled and reused water)	7,317.8 (21.1%)	6,531.3 (18.6%)	6,059.2 (16.7%)
Total, million m³	42,057.8	41,628.0	42,360.1
Share of recycled and reused water in water withdrawal, %	474.7	537.4	599.1

The volume of water used by nuclear organisations for their own needs in 2020 totalled 5,985.5 million m³, which is 464.9 million m³ less than in 2019. This was mainly due to a reduction in water consumption at Leningrad NPP.

GRI 303-5

Water consumption for own needs, million m³

Type of consumption	2018	2019	2020
Drinking and sanitary purposes	37.9	41.5	37.6
Operational needs	7,133.3	6,395.7	5,928.5
Other types	14.6	13.2	19.4
Total	**7,185.8**	**6,450.4**	**5,985.5**

Wastewater discharge

GRI 303-2

In 2020, wastewater discharge by nuclear organisations totalled 5,390.1 million m³, with clean water compliant with regulatory requirements accounting for 96.7% of the total volume, while the share of treated wastewater compliant with regulatory requirements and contaminated wastewater stood at 0.7% and 2.6% respectively.

In the structure of wastewater discharge, the main destinations are seas (3,720 million m³, or 69.0%), lakes (1,185 million m³, or 22.0%) and rivers (403 million m³, or 7.6%).

Wastewater discharge decreased by 474.4 million m³ year on year due to a decrease in discharges from Leningrad NPP into the Gulf of Finland in the Baltic Sea.

In the reporting year, discharge of treated wastewater compliant with regulatory requirements totalled 35.4 million m³, of which 6.1% was treated using the biological method, 2.3% was treated using the physical and chemical method, and 91.6% was treated using the mechanical method.

Contaminated wastewater discharge by nuclear organisations accounted for 1.1% of the total volume of discharges in Russia in 2020.

GRI 306-1

Total wastewater discharge, million m³

Water category	2018	2019	2020
Clean water compliant with regulatory requirements	6,512.3	5,635.3	5,209.8
Treated wastewater compliant with regulatory requirements	44.5	44.9	35.4
Contaminated wastewater	70.1	184.3	144.9
TOTAL	**6,626.9**	**5,864.5**	**5,390.1**

Pollutant content in wastewater in 2020, kg

Chemical oxygen demand	18,522,404.434
Suspended matter	4,045,636.000
Phosphates (phosphorus contained)	25,540.000
Hexavalent chromium	41.558
Trivalent chromium	40.713
Manganese	776.084
Iron	33,573.322
Nickel	57.648
Copper	357.324
Zinc	782.583
Molybdenum	484.983
Cadmium	0.824
Lead	15.472

Initiatives to reduce discharges of harmful substances into water bodies

In order to reduce the discharge of pollutants into water bodies by nuclear organisations, in 2017, the Company developed a Plan of High-Priority Measures to Reduce the Negative Impact of Nuclear Organisations on the Environment until 2020. Key measures implemented as part of this plan included the following:

- Wastewater treatment facilities at Kola NPP were upgraded; this involved replacing the wastewater disinfection system, which helped to prevent the release of highly toxic chlorine transformation products into the environment, and replacing filtering materials in the filters of special water treatment units, which enabled a 20% reduction in the volume of contaminated water from regeneration solutions;
- A system for collecting, treating and preparing storm water runoff for use in the process water supply system was implemented at PJSC Machinery Manufacturing Plant; this made it possible to stop its discharge into the open drainage system and use it in the production process instead of river and artesian water.

Emissions and discharges of radionuclides

In 2020, the radiation burden on the environment remained practically unchanged compared to the previous year. The total activity of radionuclides released into the atmosphere by JSC Atomenergoprom's enterprises amounted to $4.91 \cdot 10^{16}$ Bq.

Beta-emitting radionuclides accounted for 98.97% of the total activity (4.86·1016 Bq).

Total activity of radionuclides

Actual and permitted emissions of radionuclides by enterprises in the industry in 2020

Type of radionuclides	Permitted emission, Bq	Actual emission, Bq	Percentage of the permitted level
Alpha-emitting	$3.04 \cdot 10^{15}$	$5.05 \cdot 10^{14}$	16.61
Beta-emitting	$2.92 \cdot 10^{21}$	$4.86 \cdot 10^{16}$	0.002

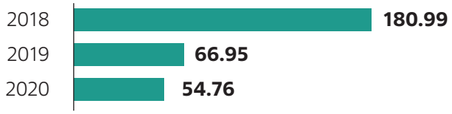
In 2020, radionuclide emissions did not exceed permitted levels.

Radionuclide discharges

JSC Atomenergoprom's organisations discharged 54.76 million m3 of wastewater with a total activity of $4.37 \cdot 10^{13}$ Bq into the open drainage system.

Compared to 2019, wastewater discharges decreased by 18.22%, while the total activity increased by 4.74%.

Volume of wastewater contaminated with radionuclides, million m³



Total activity of radionuclides discharged into the open drainage system, Bq

Actual and permitted radionuclide discharge by enterprises in the industry in 2020

Type of radionuclides	Permitted discharge, Bq	Actual discharge, Bq	Percentage of the permitted level
Alpha-emitting	$1.76 \cdot 10^{11}$	$2.04 \cdot 10^{10}$	11.63
Beta-emitting	$5.32 \cdot 10^{15}$	$4.37 \cdot 10^{13}$	0.82

In 2020, radionuclide discharges did not exceed permitted levels.

Contaminated sites and their remediation

GRI 103-1

At year-end 2020, there were radionuclide-contaminated sites in 18 enterprises in the industry. The area of contaminated sites totalled 112.28 km², including:

- 24.70 km² at industrial sites;
- 87.07 km² in buffer areas;
- 0.51 km² in radiation control areas.

Radioactive contamination is caused mainly by caesium-137 and strontium-90, as well as natural uranium and products of its decay

The area of contaminated sites remediated over the past five years totals 1.33E-2 km²; in 2020, no site remediation was carried out in the industry.

Improving energy efficiency

GRI 103-1
GRI 103-2

Energy conservation is an important prerequisite for the efficient use of JSC Atomenergoprom's energy resources, making it more competitive and reducing the negative impact on the environment. An energy conservation and energy efficiency improvement programme for the period from 2018 to 2022 is being implemented in the Russian nuclear industry.

The Company's organisations have implemented most elements of an energy management system compliant with the international ISO 50001 standard.

GRI 302-4

In 2020, the cumulative total reduction in energy consumption in the Russian nuclear industry against 2015 as the base year under comparable conditions amounted to 9.84%. In monetary terms, savings totalled RUB 1.67 billion (excluding VAT). In physical terms, energy savings by JSC Atomenergoprom's enterprises totalled 8,354,715.08 GJ.

Energy cost reduction in 2020

Division	Cumulative total vs 2015, RUB million (excluding VAT)	Cumulative total vs 2015, %
JSC Atomredmetzoloto	227.60	12.64
JSC Atomenergomash	187.35	19.65
JSC Rosenergoatom	90.40	4.86
Other	1,163.43	7.45
Total across JSC Atomenergoprom	**1,668.77**	**8.25**

Appendices

GRI 102-47
GRI 102-55

Appendix 1. GRI Content Index

Indicator	Subsection/Comment	Page
GRI 101: Foundation (2016)		
GRI 102: General Disclosures (2016)		
Organisational profile		
102-1 Name of the organisation	Company Profile	
102-2 Activities, brands, products, and services	Markets Served by Atomenergoprom Business Diversification	
102-3 Location of headquarters	Company Profile	
102-4 Location of operations	Business Diversification	
102-5 Ownership and legal form	Company Profile Legal form: state-owned corporation	
102-6 Markets served	Markets Served by Atomenergoprom Business Diversification	
102-7 Scale of the organisation	JSC Atomenergoprom Today Key Results in 2020 Financial and Economic Results Personnel Management Appendix 2	
102-8 Information on employees and other workers	Personnel Management	
102-9 Supply chain	Markets Served by Atomenergoprom JSC Atomenergoprom Today	
102-10 Significant changes to the organisation and its supply chain	Corporate Governance	
102-11 Precautionary Principle or approach	Environmental Safety Additional information on the use of the precautionary principle is provided in the Unified Industry Policy on Sustainable Development and on ROSATOM's website: https://www.rosatom.ru/upload/iblock/74e/74eb9c650aa73e74d0b9b9aadea0c1f8.pdf http://rosatom.ru/production/safety.	
102-12 External initiatives	Sustainable Development Management Nuclear and Radiation Safety; Occupational Safety and Health	
102-13 Membership of associations	Membership of associations is maintained by JSC Atomenergoprom's organisations. More specifically, NIKIET is a member of the Russian National Committee of the World Energy Council (an association of companies in the fuel and energy sector); a number of JSC Atomenergoprom's organisations are members of the World Nuclear Association.	
Strategy		
102-14 Statement from senior decision-maker	Message from the Management	
Ethics and integrity		
102-16 Values, principles, standards, and norms of behaviour	Personnel Management	
102-17 Mechanisms for advice and concerns about ethics	Personnel Management	
Governance		
102-18 Governance structure	Corporate Governance There are no committees under the Board of Directors of JSC Atomenergoprom	
102-22 Composition of the highest governance body and its committees	Corporate Governance http://atomenergoprom.ru/ru/invest/q_reports/ (see the Issuer's Report for Q4 2020)	
102-34 Nature and total number of critical concerns	Corporate Governance	
102-36 Process for determining remuneration	Corporate Governance The amount of remuneration of the members of the Board of Directors is stipulated in paragraph 3.2 of the Regulations on the Board of Directors. No remuneration consultants are involved.	
Stakeholder engagement		
102-40 List of stakeholder groups	Stakeholder Engagement	
102-41 Collective bargaining agreements	Personnel Management	
102-42 Identifying and selecting stakeholders	Stakeholder Engagement	
102-43 Approach to stakeholder engagement	Stakeholder Engagement No stakeholder engagement was undertaken specifically as part of the report preparation process.	
102-44 Key topics and concerns raised	Safe Operation	
Report profile		
102-45 Entities included in the consolidated financial statements	The scope of JSC Atomenergoprom's report includes all organisations listed in Appendix 2.	
102-46 Defining report content and topic Boundaries	Report Profile. The Reporting Principles set out in the GRI Standards are reflected in the Uniform Industry-Wide Public Reporting Policy of ROSATOM.	
102-47 List of material topics	Appendix 1. GRI Content Index	

Indicator	Subsection/Comment	Page
102-48 Restatements of information	Key Results	
102-49 Changes in reporting	Key Results. There are no other significant changes from previous reporting periods.	
102-50 Reporting period	Report Profile	
102-51 Date of most recent report	The previous report of JSC Atomenergoprom was published in May 2020.	
102-52 Reporting cycle	Report Profile	
102-53 Contact point for questions regarding the report	Contact Details	
102-54 Claims of reporting in accordance with the GRI Standards	Report Profile	
102-55 GRI content index	Appendix 1. GRI Content Index	
102-56 External assurance	The Company's policy with regard to seeking external assurance is set out in the Uniform Industry-Wide Methodological Guidelines on Public Reporting of ROSATOM and Its Organisations. The assurance report is available on the website at https://report.rosatom.ru/aep	
Material topics		
1. Implementation of the Company's strategy		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Business Strategy until 2030	
2. Nuclear and radiation safety		
GRI 416: Customer Health and Safety (2016)		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3		
416-2 Incidents of non-compliance concerning the health and safety impacts of products and services	There were no incidents of non-compliance concerning the impacts of products and services on customer health and safety.	
3. Prospects for the development of the nuclear power industry		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Sustainable Development Management	

Indicator	Subsection/Comment	Page
6. Emergency preparedness		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Nuclear and Radiation Safety; Occupational Safety and Health	
12. Development of international business and international cooperation		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	International Cooperation	
13. Traditional and new markets		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Markets Served by Atomenergoprom	
14. Financial and economic performance		
GRI 201: Economic Performance (2016)		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Developing Nuclear Towns and Cities	
201-4 Financial assistance received from government	The Company did not receive any financial assistance from the government in the reporting year.	
15. Innovation and scientific and technological advancement		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Innovations and New Products	
16. Business diversification		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Business Diversification	
17. Business risks and opportunities		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Risk Management	
19. Performance of the Company's Divisions		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Performance of Divisions	

Indicator	Subsection/Comment	Page
24. Social and economic impact on the regions of operation (including closed administrative and territorial formations (CATFs)) and local communities		
GRI 413: Local Communities (2016)		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Stakeholder Engagement	
413-1: Operations with local community engagement, impact assessments, and development programmes	JSC Atomenergoprom and its organisations do not have any separate arrangements with their regions of operation. Local community engagement forms part of ROSATOM's stakeholder engagement.	
GRI 203: Indirect Economic Impacts		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Developing Nuclear Towns and Cities	
203-2 Significant indirect economic impacts	Developing the Regions Where Nuclear Facilities Are Located	
25. Provision of access to energy		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Power Engineering Division	
26. Occupational health and safety		
GRI 403: Occupational Health and Safety (2018)		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Nuclear and Radiation Safety; Occupational Safety and Health	
403-1 Occupational health and safety management system	The requirements of the occupational health and safety management system are binding on all employees and all persons who are on the premises of the organisation, in its buildings and structures. The relevant regulations are listed in section 11 of the Uniform Industry-Wide Guidelines for Developing and Improving an Occupational Health and Safety Management System in ROSATOM's Organisations.	
403-2 Hazard identification, risk assessment, and incident investigation	Nuclear and Radiation Safety; Occupational Safety and Health	
403-3 Occupational health services	Nuclear and Radiation Safety; Occupational Safety and Health	
403-4 Worker participation, consultation, and communication on occupational health and safety	The operation of occupational health and safety committees (commissions) is governed by section 6.3. 'Occupational Safety and Health Committee (Commission)' of the Uniform Industry-Wide Guidelines for Developing and Improving an Occupational Health and Safety Management System in ROSATOM's Organisations.	
403-5 Worker training on occupational health and safety	Nuclear and Radiation Safety; Occupational Safety and Health Employee Training	
403-6 Promotion of worker health	Social Policy	
403-7 Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	The Company does not impose any occupational health and safety requirements on its suppliers and contractors, except for those that are employed at the Company's sites.	
403-9 Work-related injuries[56]	Nuclear and Radiation Safety; Occupational Safety and Health. Number of people injured in accidents: 15 Number of fatalities: 0 Number of serious injuries: 5 Rate of fatalities: 0 Rate of high-consequence work-related injuries (per 1 million man-hours): 0.02 LTIFR: 0.06 Number of hours worked across JSC Atomenergoprom's organisations: 228,321,096 man-hours	
403-10 Work-related ill health[57]	10 people were newly diagnosed with an occupational disease.	
27. Cooperation with universities and recruitment of young professionals		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Personnel Management	

[56] Information is disclosed in part; injury rates are not disclosed for contractor organisations, as no records of hours worked by contractors are kept.
The number of persons injured in accidents includes information on employees at the sites of JSC Atomenergoprom's organisations, including abroad, provided that the employee works for an organisation within the scope of consolidation of JSC Atomenergoprom, is employed under Russian law, and the accident has been investigated under Russian law. The Company records those accidents the investigation of which has been completed (after all necessary documents have been prepared).
The LTIFR calculation does not include employees injured in traffic accidents caused by third parties, those whose health suddenly deteriorated due to an illness and those who suffered a sports-related injury (one person).

[57] Information is disclosed in part; no data are collected and no records are kept on occupational diseases of employees in contractor organisations. No records are kept on the number of fatalities as a result of work-related ill health.

Indicator	Subsection/Comment	Page
28. Personnel management, social policy and corporate culture ***46. Personnel management, planning, training, retraining and knowledge transfer. Mentoring*** ***47. Personnel education***		
GRI 401: Employment (2016)		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Personnel Management	
401-2: Benefits provided to full-time employees that are not provided to temporary or part-time employees	Personnel Management Compensation and benefits under corporate social programmes implemented by the Company are provided to full-time employees.	
GRI 402: Labour/Management Relations (2016)		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Personnel Management	
402-1 Minimum notice periods regarding operational changes	Personnel Management. The Company fully complies with the requirements of the law concerning the minimum notice periods regarding significant changes. The minimum notice period for significant operational changes is consistent with the time frame stipulated in the Labour Code of the Russian Federation. Personnel Management.	
GRI 404: Training and Education (2016)		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Personnel Management	
404-1 Average hours of training per year per employee	Personnel Management Average training hours per employee based on the headcount of JSC Atomenergoprom's organisations in 2020 totals 42.1. Information is disclosed in part: no breakdown by gender is provided as it is difficult to collect consolidated information across all organisations of JSC Atomenergoprom. The Company will consider gathering and consolidating additional information in the medium term.	
404-2 Programmes for upgrading employee skills and transition assistance programmes	Personnel Management	
404-3 Percentage of employees receiving regular performance and career development reviews	In 2020, performance evaluation covered 75% of executives, specialists and white-collar workers in JSC Atomenergoprom's organisations that have implemented a performance management system based on the RECORD integrated industry-wide system (82 organisations, including 10 NPPs, which are branches of Rosenergoatom). Information is disclosed in part. No breakdown by gender is provided (as it is difficult to collect consolidated information across all organisations of JSC Atomenergoprom), and no information is provided on performance evaluation of blue-collar workers (as they are not covered by the RECORD system).	
30. Respect and exercise of human rights		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Personnel Management	
GRI 406: Non-discrimination (2016)		
406-1 Incidents of discrimination and corrective actions taken	No incidents of discrimination were recorded in 2020.	
34. Response to the pandemic (business continuity, personnel, external stakeholders) ***43. Development of herd immunity against COVID-19***		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Message from the Management	
35. Radiation impact on the environment		
GRI 304: Biodiversity (2016)		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Environmental Safety	
304-3 Habitats protected or restored	Environmental Safety There are no partnerships with third parties to protect or restore habitat areas.	
36. Development of technologies reducing the environmental footprint		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Environmental Safety	
37. Environmental protection and environmental performance		

Indicator	Subsection/Comment	Page
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Environmental Safety	
38. Emissions		
GRI 305: Emissions (2016)		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Environmental Safety	
305-6 Emissions of ozone-depleting substances	Environmental Safety	
305-7 Nitrogen oxides (NOX), sulphur oxides (SOX), and other significant air emissions	Environmental Safety There are no emissions of persistent organic pollutants or hazardous air pollutants.	
39. Management of effluents and waste		
GRI 303: Water and Effluents (2018)		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Environmental Safety	
303-1 Interactions with water as a shared resource	Environmental Safety	200
303-2 Management of water discharge-related impacts	Environmental Safety	201
303-3 Water withdrawal	Environmental Safety No water is withdrawn in areas with water stress. No groundwater is withdrawn. Seawater is included in the 'Other' category. Surface water is included in the 'Fresh water' category.	
303-5 Water consumption	Environmental Safety	
GRI 306: Effluents and Waste (2016)		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Environmental Safety	
306-1 Water discharge by quality and destination	Environmental Safety	
306-2 Waste by type and disposal method	Environmental Safety	
306-3 Significant spills	There were no significant spills in the reporting period.	
306-4 Transport of hazardous waste	Environmental Safety	
40. Compliance with environmental and technical standards		
GRI 307: Environmental Compliance (2016)		

Indicator	Subsection/Comment	Page
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Environmental Safety	
307-1 Non-compliance with environmental laws and regulations	Environmental Safety	
41. Energy efficiency		
GRI 302: Energy (2016)		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Environmental Safety	
302-4 Reduction of energy consumption	Environmental Safety	
42. Management of disturbed and contaminated areas		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Environmental Safety	
44. Volunteering		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Personnel Management	
45. Adaptation to climate change and greenhouse gas emissions		
GRI 103: Management Approach (2016) GRI 103-1 GRI 103-2 GRI 103-3	Sustainable Development Management	

GRI 102-7
GRI 102-45

Appendix 2.

List of Organisations within the Scope of Consolidation of JSC Atomenergoprom under IFRS

No.	Abbreviated name	Full name
1.	**ARAKO**	ARAKO spol. s r.o.
2.	**EMSS Holdings**	EMSS Holdings Limited
3.	**Ganz**	Ganz Energetika Kft.
4.	**INTERNEXCO GmbH (Switzerland)**	INTERNEXCO GmbH (Switzerland)
5.	**KWINDER HOLDINGS LIMITED**	KWINDER HOLDINGS LIMITED
6.	**Mantra Resources Ltd.**	Mantra Resources Pty Ltd.
7.	**Raims**	RAIMS Limited
8.	**RAOS Project**	RAOS Project Oy
9.	**RAOS Voima**	RAOS Voima Oy
10.	**REIN**	JSC Rusatom Energy International
11.	**ROSATOM FINANCE**	ROSATOM FINANCE LTD
12.	**TENEX-Japan**	KABUSHIKI KAISHA TENEX-JAPAN
13.	**TENEX-Korea**	TENEX-Korea Co., Ltd.
14.	**TENEX-USA**	TENEX-USA, Incorporated
15.	**TRADEWILL LIMITED**	TRADEWILL LIMITED
16.	**UMATEX Composite Materials Trading**	UMATEX Composite Materials Trading (Shanghai) Co., Ltd.
17.	**UMATEX Group Europe**	UMATEX Group Europe s.r.o.
18.	**UMP Trading**	UMP Trading (Switzerland)
19.	**Uranium**	Uranium One Inc.
20.	**Uranium One Holding N.V.**	Uranium One Holding N.V.
21.	**Uranium One Trading AG**	Uranium One Trading AG
22.	**Akkuyu Nukleer**	AKKUYU NUKLEER ANONIM SIRKETI
23.	**ALABUGA-FIBRE**	LLC Alabuga-Fibre
24.	**Argon**	LLC Argon
25.	**ARMZ**	JSC Atomredmetzoloto Uranium Holding Co.
26.	**ARMZ Service**	LLC ARMZ Service
27.	**ATA**	JSC Alliancetransatom
28.	**ATM**	JSC Atomtruboprovodmontazh
29.	**Atomgarant**	JSC Non-State Pension Fund Atomgarant
30.	**AMT-DV**	LLC AtomMedTechnology – Far East
31.	**Atomspectrans**	JSC Atomic Industry Transport and Logistics
32.	**Atomtekhexport**	JSC Atomtekhexport
33.	**AtomTechEnergo**	JSC AtomTechEnergo Nuclear Power Plant Commissioning, Operation Improvement and Management
34.	**Atomfond**	JSC Non-State Pension Fund Atomfond
35.	**Atomenergomash**	JSC Nuclear and Power Engineering (JSC Atomenergomash)
36.	**Atomenergopromsbyt**	JSC Atomenergopromsbyt
37.	**Atomenergoremont**	JSC Atomenergoremont
38.	**Atom Energy Trade**	JSC Atom Energy Trade
39.	**AEM-Technology**	JSC Engineering Company AEM-Technology
40.	**AECP**	JSC Angarsk Electrolysis Chemical Plant
41.	**Baltic NPP**	JSC Baltic NPP
42.	**WindSGC-2**	JSC Separate Wind Power Generating Company-2
43.	**VNIIAES**	JSC Russian Research and Development Institute for Nuclear Power Plant Operation
44.	**VNIINM**	JSC Bochvar High-Technology Research Institute for Inorganic Materials
45.	**VNIIHT**	JSC Scientific Research Institute of Chemical Technology (VNIIHT)
46.	**VNIPIPT**	JSC Design & Survey and Research & Development Institute of Industrial Technology
47.	**Isotope**	JSC Isotope Regional Alliance
48.	**GIDROPRESS**	JSC Experimental and Design Organisation GIDROPRESS Awarded the Order of the Red Banner of Labour and CZSR Order of Labour
49.	**Giredmet**	JSC Federal State Research and Development Institute of Rare Metal Industry
50.	**Greenatom**	JSC Greenatom
51.	**GSPI**	JSC State Specialised Design Institute (JSC GSPI)
52.	**DALUR**	JSC DALUR
53.	**SPC Dedal**	JSC Scientific Production Complex Dedal
54.	**CEPD**	JSC Consolidated NPP Equipment Procurement Directorate (JSC CEPD)
55.	**ZAES**	JSC ZAES Russian Production Association (JSC ZAES)
56.	**ZIO-Podolsk**	Joint-Stock Company ZIO-Podolsk Mechanical Engineering Plant
57.	**C&CMP**	LLC Carbon and Composite Materials Plant
58.	**INM**	JSC Research Institute of Nuclear Materials
59.	**Iskra**	LLC Iskra

No.	Abbreviated name	Full name
60.	**IPTP**	JSC Institute for Physical and Technical Problems
61.	**EC RGC**	JSC Engineering Centre Russian Gas Centrifuge
62.	**KMP**	PJSC Kovrov Mechanical Plant
63.	**CONSYST**	JSC CONSYST – Communication Provider
64.	**CONCERN TITAN-2**	JSC CONCERN TITAN-2
65.	**Red Star**	JSC Red Star
66.	**Kraun**	LLC Kraun
67.	**Commercial Centre**	Public Joint-Stock Company Commercial Centre
68.	**NFCL**	JSC NFC Logistics
69.	**MZP**	JSC Moscow Polymetal Plant
70.	**Molniya**	JSC Manufacturing Association Machine Works Molniya
71.	**MSZ**	PJSC MSZ Machinery Manufacturing Plant
72.	**MSZ-M**	LLC MSZ MEKHANIKA
73.	**Science and Innovations**	JSC Science and Innovations
74.	**NCCP**	PJSC Novosibirsk Chemical Concentrates Plant
75.	**NZHK-Instrument**	LLC NZHK-Instrument
76.	**NZHK-Energia**	LLC NZHK-Energia
77.	**NIIgrafit**	JSC Research Institute for Graphite-Based Structural Materials NIIgrafit
78.	**NIITFA**	JSC National Technical Physics and Automation Research Institute (NIITFA)
79.	**NIKIET**	JSC N.A. Dollezhal Research and Development Institute of Power Engineering
80.	**NovaWind**	JSC NovaWind
81.	**RPC KhPE**	JSC RPC Khimpromengineering
82.	**RME Centrotech**	LLC Research and Manufacturing Enterprise Centrotech
83.	**YAFI**	JSC Scientific Engineering Centre Nuclear Physics Research
84.	**Obespechenie RFNC VNIIEF**	JSC Obespechenie RFNC VNIIEF
85.	**UGR Centre**	JSC Pilot Production and Demonstration Centre for Decommissioning of Uranium-Graphite Nuclear Reactors
86.	**UIC**	LLC United Innovation Corporation
87.	**UC RSK**	JSC United Company Separation and Sublimation Complex
88.	**Afrikantov OKBM**	JSC Afrikantov OKB Mechanical Engineering
89.	**First Ore-Mining Company**	JSC First Ore-Mining Company
90.	**PIMCU**	PJSC Priargunsky Industrial Mining and Chemical Union

No.	Abbreviated name	Full name
91.	**Prepreg-Dubna**	LLC Prepreg-Dubna
92.	**Prepreg-ACM**	JSC Prepreg – Advanced Composite Materials
93.	**Industrial Innovation**	JSC Industrial Innovation
94.	**PRORYV**	JSC Proryv
95.	**RPS**	JSC RPS Production System
96.	**RAOS**	JSC Rusatom Overseas
97.	**RASU**	JSC Rusatom Automated Control Systems
98.	**RUSBURMASH**	JSC RUSBURMASH
99.	**RIR**	JSC Rusatom Infrastructure Solutions
100.	**RIR-Sarov**	LLC Rusatom Infrastructure Solutions – Sarov
101.	**REA**	JSC Rosenergoatom
102.	**Rusatom Water Asia**	LLP JV Rusatom Water Asia
103.	**Rusatom Greenway**	JSC Rusatom Greenway
104.	**Rusatom Cargo**	LLC Rusatom Cargo
105.	**Rusatom Service**	JSC Rusatom Service
106.	**Rusreactor**	JSC Rusatom Solution Reactors
107.	**Rusatom Healthcare**	JSC Rusatom Healthcare
108.	**RDP**	LLC Regional Digital Platforms
109.	**RDS**	LLC Rusatom Digital Solutions
110.	**REMCO**	JSC Russian Energy Engineering Company
111.	**C-plus**	Limited Liability Company C-plus
112.	**Cyprus**	ATOMENERGOMASH CYPRUS LIMITED
113.	**SCERI**	JSC Sverdlovsk Chemical Engineering Research Institute (SCERI)
114.	**SGC**	JSC Sarov Generating Company
115.	**SMB**	LLC Berkut Monitoring Systems
116.	**SNIIP**	JSC Specialised Scientific Research Institute for Instrumentation Engineering (JSC SNIIP)
117.	**SPb IZOTOP**	JSC Saint Petersburg IZOTOP
118.	**SHNC**	JSC Sarov Heating Network Company
119.	**SCP**	JSC Siberian Chemical Plant
120.	**TVEL**	JSC TVEL
121.	**TVEL-STROY**	JSC TVEL-STROY
122.	**TENEX-Service**	JSC TENEX-Service
123.	**Teplovodokanal**	LLC Teplovodokanal

No.	Abbreviated name	Full name
124.	**TENEX**	JSC TENEX
125.	**Tochmash**	JSC Vladimir Tochmash Production Association
126.	**Tochmash-Avto**	LLC Tochmash-Avto
127.	**TENEX TC**	CJSC TENEX Technology Centre
128.	**ABMC**	JSC Administrative Building Management Company
129.	**MC Nizhniye Kotly**	JSC Nizhniye Kotly Industrial Park Management Company
130.	**Uranium One**	JSC Uranium One Group
131.	**UEIP**	JSC Ural Electrochemical Integrated Plant
132.	**Khiagda**	JSC Khiagda
133.	**AEM**	LLC AEM Holding Company
134.	**CAD**	LLC Centre for Advanced Diagnostics
135.	**CenterAtom**	JSC Centre for Management of Non-Core Assets of the Nuclear Industry
136.	**CDBMB**	JSC Central Design Bureau of Machine Building
137.	**CNIITMASH**	JSC Research and Production Association Central Research Institute of Machine Building Technology
138.	**UEC**	JSC Uranium Enrichment Centre
139.	**SCDP&S**	JSC Smart City Digital Platforms and Solutions
140.	**CMP**	JSC Chepetsk Mechanical Plant
141.	**Private Institution Science and Innovation**	Private Institution Science and Innovation
142.	**Elkon MMP**	JSC Elkon Mining and Metallurgical Plant
143.	**Ecoalliance**	LLC Ecoalliance
144.	**Eleron**	JSC Federal Centre of Science and High Technologies Special Scientific & Production Enterprise Eleron
145.	**Energomashspetsstal**	PJSC Energomashspetsstal
146.	**ENIC**	JSC Elektrogorsk Research and Development Centre for Nuclear Power Plants Safety
147.	**ECP**	JSC Production Association Electrochemical Plant
148.	**NMT-Snezhinsk**	LLC Nuclear Medical Technologies – Snezhinsk
149.	**TITAN2 IC**	TITAN2 IC ICTAS INSAAT ANONIM SIRKETI
150.	**AEP**	JSC Atomic Energy Power Corporation (JSC Atomenergoprom)

Feedback Form

Dear readers,

You have read the annual report of JSC Atomenergoprom, which is intended for a wide range of stakeholders. We attach great importance to the opinion of the readers of our Report. We would appreciate it if you helped improve the quality of the Company's reports by completing the questionnaire below.

Please return the completed form by mail to the Communications Department or to the Treasury Department at 24 Bolshaya Ordynka Street, Moscow, 119017 or by email (EAMamy@rosatom.ru).

1. Please assess the Report using the following criteria:

Accuracy and objectivity

☐ Excellent ☐ Good ☐ Satisfactory ☐ Poor

Completeness and relevance of information

☐ Excellent ☐ Good ☐ Satisfactory ☐ Poor

Report structure, ease of reference, wording

☐ Excellent ☐ Good ☐ Satisfactory ☐ Poor

2. Please specify which sections of the Report you have found to be relevant and useful:

3. What topics do you think should be covered in the next Report?

4. Your recommendations and additional comments:

5. Please specify which stakeholder group you represent:

- ☐ Employee of JSC Atomenergoprom or ROSATOM
- ☐ Employee of an organisation forming part of JSC Atomenergoprom or ROSATOM
- ☐ Representative of the federal government
- ☐ Representative of a regional government
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- ☐ Representative of the expert community
- ☐ Other (please specify)

GRI 102-53

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