

**75 YEARS
OF NUCLEAR
INDUSTRY**

AHEAD
OF THE TIMES



**JOINT-STOCK COMPANY
ATOMENERGOPROM
ANNUAL REPORT
2019**



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OF NUCLEAR
INDUSTRY**

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ATOMENERGOPROM

ROSATOM

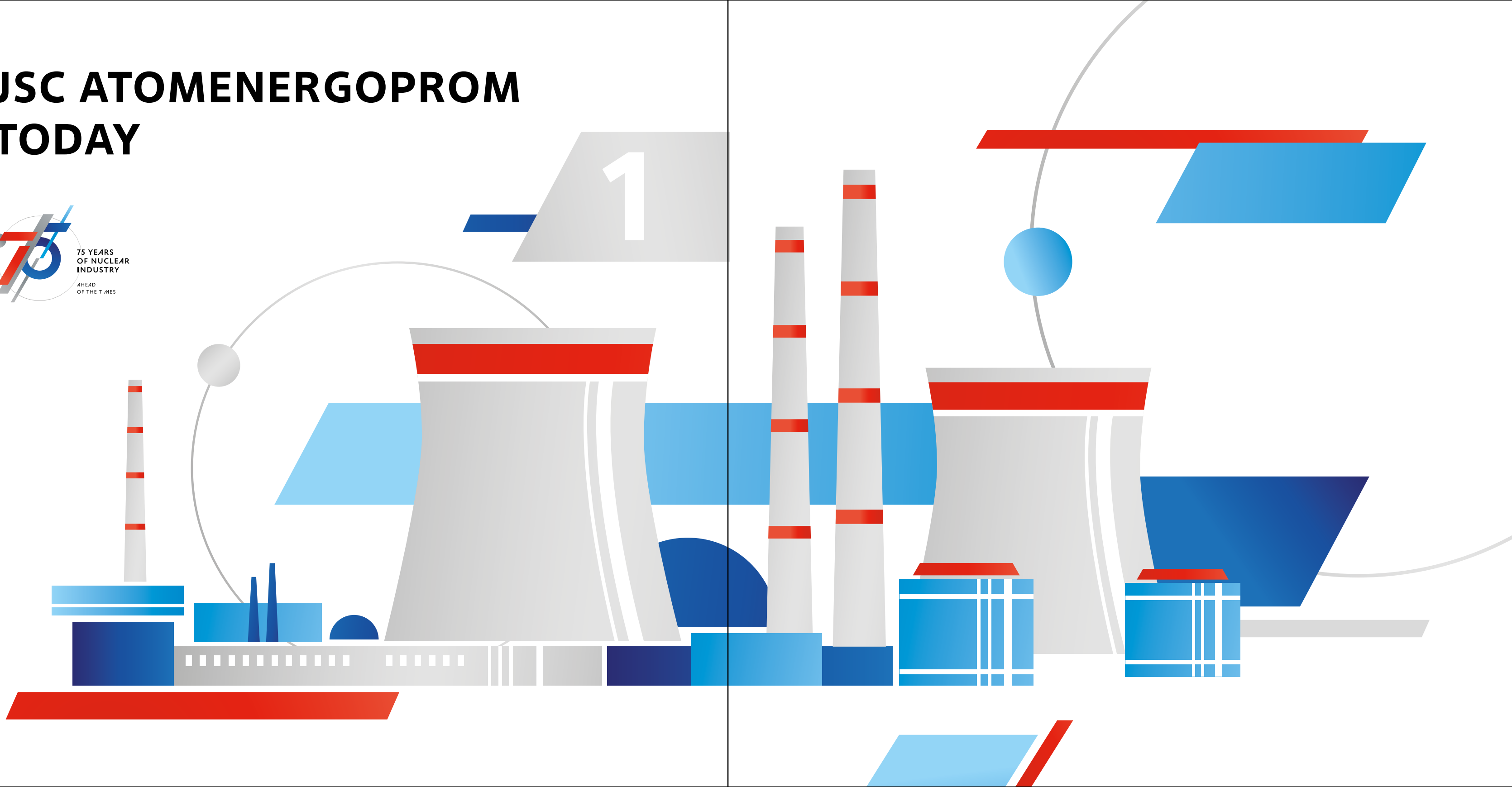
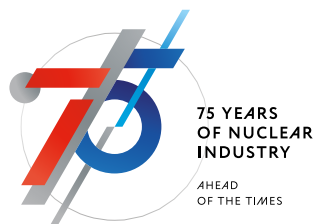
ANNUAL REPORT 2019

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JSC ATOMENERGOPROM TODAY



COMPANY PROFILE

Joint-Stock Company Atomic Energy Power Corporation (JSC Atomenergoprom)

Primary state registration number (OGRN): 1077758081664.
State registration date: July 19, 2007.
State registration authority: Inter-District Inspectorate No. 46 of the Federal Tax Service in Moscow.
Location: 24 Bolshaya Ordynka Street, Moscow.
Tel.: +7 (495) 969-29-39.
Fax: +7 (495) 969-29-36.
Official website: <http://atomenergoprom.ru/en/>.

SHAREHOLDERS OF JSC ATOMENERGOPROM

Holders of record of JSC Atomenergoprom as at December 31, 2019:

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 authorized share capital: 94.45%.
Portion of voting shares held by the entity: 100%.

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 authorized share capital: 5.55%.
Portion of voting shares held by the entity: 0%.

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 2019.

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: December 3, 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: October 28, 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

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 2019 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 2019. The Report also outlines the Company's achievements in the sphere of sustainable development (nuclear and radiation safety, environmental protection, contribution to the development of the Company's regions of operation, implementation of the HR policy, etc.).

JSC Atomenergoprom publishes its reports on a yearly basis. The previous annual report was published in 2019. This Report covers the operating results of the Company and its organizations for the period from January 1 through December 31, 2019. 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 Public Reporting Policy of ROSATOM and the Public Reporting Standard of ROSATOM and its organizations;
- The International Integrated Reporting Framework of the International Integrated Reporting Council (The International <IR> Framework);
- The Global Reporting Initiative (GRI) Sustainability Reporting Standards: this Report has been prepared in accordance with individual GRI Standards listed in Appendix 1;
- The AA1000 AccountAbility Principles Standard;
- Federal Law No. 208-FZ on Joint-Stock Companies dated December 26, 1995;
- Regulations of the Bank of Russia No. 454-P on Disclosure of Information by Issuers of Issue-Grade Securities dated December 30, 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, members of the working group preparing the Report and representatives of major stakeholder groups prioritized 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.

As a result, a ranking map of material topics to be disclosed in the Report was prepared. The decision to include various GRI performance indicators and performance indicators stipulated in ROSATOM's Public Reporting Standard 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.

VERIFICATION OF REPORTING INFORMATION

Reporting information was certified as accurate and reliable by an independent auditor which certifies the annual financial statements.

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.

MESSAGE FROM THE MANAGEMENT

Dear colleagues and partners,

2019 marked yet another important milestone for JSC Atomenergoprom's business.

A highlight of the year was an update to the long-term strategy for the development of the Russian nuclear industry. We supplemented our three strategic goals of increasing our international market share, reducing production costs and the lead time and developing new products for the Russian and international markets with a fourth goal: achieving global leadership in state-of-the-art technology.

JSC Atomenergoprom is a leader in low-carbon power generation in Russia. Electricity output at NPPs totalled 208.8 billion kWh, accounting for 19% of the country's total electricity output. JSC Atomenergoprom is also developing the wind power business. In early 2020, the Company's first wind farm started to supply electricity to the Russian wholesale market, with the capacity of wind power plants to be built by the Company totalling 1 GW.

The Company achieved all its operational targets. Power unit No. 2 of Novovoronezh NPP-2 started commercial operation ahead of schedule. This is the third state-of-the-art generation 3+ power unit in Russia, meeting the highest safety standards. A floating thermal nuclear power plant was connected to the power grid in Chukotka; it will facilitate the development of the region, including local manufacturing enterprises and infrastructure.

In the reporting year, the Company was successfully promoting its technological solutions on foreign markets. The Company signed general contracts for the construction of new NPP power units in China and contracts for the supply of nuclear fuel to NPPs in China, Slovakia and Bulgaria.

JSC Atomenergoprom continued to develop new products and put them on the market. By the end of 2019, our product portfolio covered 81 areas, including seven 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.

In 2019, the Company demonstrated strong financial performance. Its revenue under IFRS increased by 12.5% year on year to RUB 886.8 billion. EBITDA reached RUB 346.6 billion. Profit under IFRS for the reporting period totalled RUB 140.4 billion.

Safety remains our top priority. Throughout 2019, all nuclear facilities operated safely and reliably.

We believe that the Company's achievements not only facilitate progress in the implementation of our corporate plans, but also make a major contribution to the achievement of the UN Sustainable Development Goals. We would like to thank all employees of JSC Atomenergoprom's organizations for the work that they have done. 2020 marks the 75th anniversary of the Russian nuclear industry, and we are convinced that together, we will continue to produce impressive results benefiting our country and the world as a whole! ■



EKATERINA LYAKHOVA
Chair of the Board of Directors
of JSC Atomenergoprom



KIRILL KOMAROV
Director of JSC Atomenergoprom

We supplemented our three strategic goals of increasing our international market share, reducing production costs and the lead time and developing new products for the Russian and international markets with a fourth goal: achieving global leadership in state-of-the-art technology.

JSC ATOMENERGOPROM TODAY

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

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

JSC Atomenergoprom 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 many leading organizations and enterprises in the nuclear industry, whose development started over 70 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, environmental projects and other new areas of business (see the section 'Business Diversification'). ■

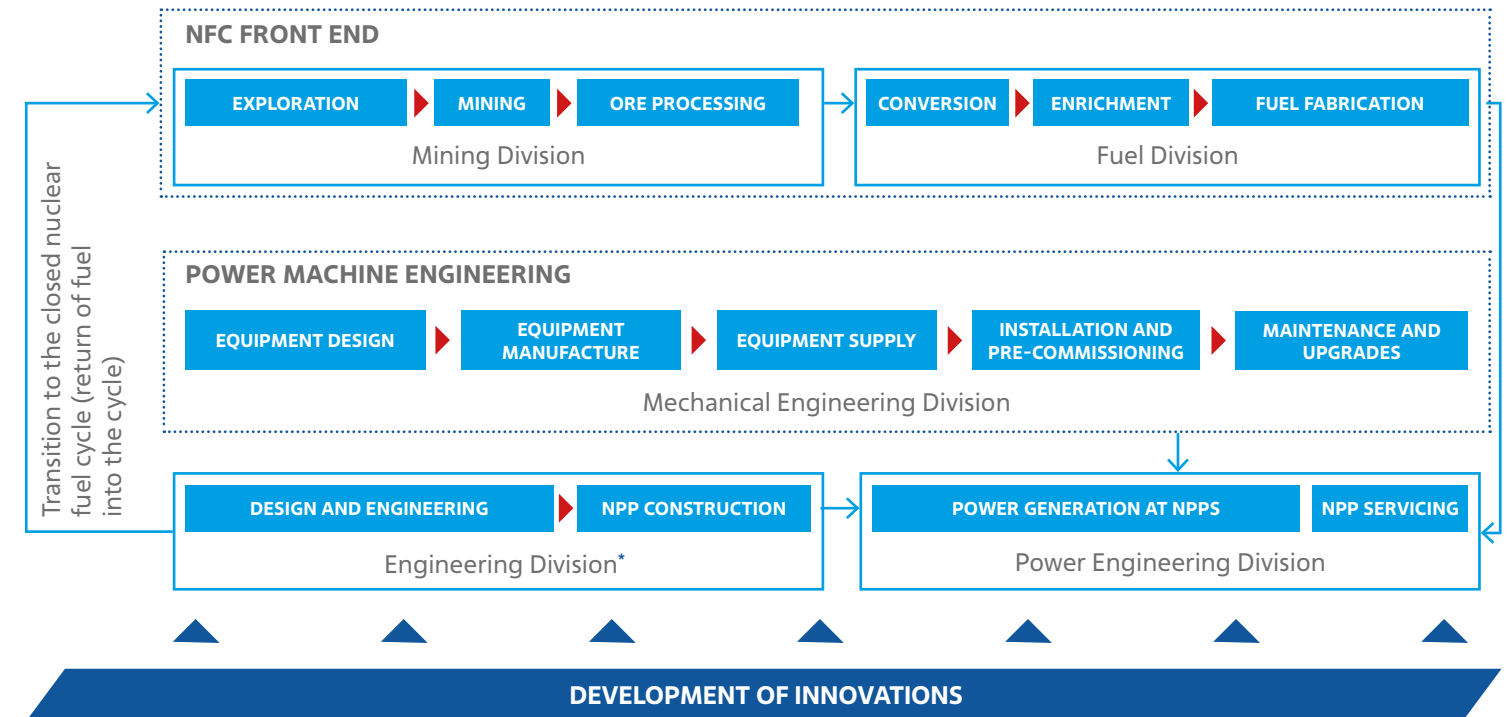
No. 1

IN THE WORLD

in terms of the number of NPP power units in the portfolio of foreign projects (36 power units)*

* Including the project portfolio of ROSATOM.

PRODUCTION AND PROCESS CHAIN OF JSC ATOMENERGOPROM



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

* The Engineering Division forms part of ROSATOM.

<h1 style="font-size: 48px;">No. 1</h1>	<h1 style="font-size: 48px;">No. 2</h1>	<h1 style="font-size: 48px;">16%</h1>	<h1 style="font-size: 48px;">19%</h1>
IN THE WORLD	IN THE WORLD	SHARE	SHARE
in terms of uranium enrichment (38% of the global market)	in terms of uranium resources and production	of the global nuclear fuel market	of electricity generation in Russia

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 June 8, 2007, pursuant to Federal Law No. 13-FZ on Peculiarities of the Management and Disposal of the Property and Shares of Organizations Operating in the Nuclear Power Industry and on Introducing Amendments to Selected Russian Laws of February 5, 2007, Decree No. 556 of the Russian President on Restructuring the Russian Nuclear Power Generation Complex dated April 27, 2007 and Resolution No. 319 of the Russian Government on Measures for Establishing Joint-Stock Company Atomic Energy Power Corporation dated May 26, 2007.

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

Thus, the formation of the Company's authorized 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 December 31, 2019, JSC Atomenergoprom's scope of consolidation in accordance with IFRS comprised 148¹ companies of different legal forms.

As at December 31, 2019, the shareholders of JSC Atomenergoprom were ROSATOM (94.4491%)² and the Russian Federation represented by the Russian Ministry of Finance (5.5509%). ■

¹ Including JSC Atomenergoprom.

² ROSATOM holds 100% of voting shares in JSC Atomenergoprom.

KEY EVENTS IN 2019

■ Power unit No. 2 of Novovoronezh NPP-2 started commercial operation ahead of schedule.

■ The floating nuclear power plant in Pevek (Chukotka Autonomous District) was connected to the isolated power system of the Chaun-Bilibino energy hub and will now provide power supply to the region.

■ Electricity output at 36 power units of 10 operating NPPs totalled 208.8 billion kWh, reaching a new all-time high in the history of Russian nuclear power generation. The share of NPPs in Russia's energy mix totalled 19%.

■ Industrial production of MOX fuel for fast neutron reactors was set up for the first time in Russia, and the first batch of this fuel was loaded into the core of the BN-800 reactor at Beloyarsk NPP.

■ 7 intergovernmental agreements and 23 major interdepartmental agreements were concluded.

■ The Company signed general contracts for the construction of power units No. 7 and 8 of Tianwan NPP and power units No. 3 and 4 of Xudabao NPP in China.

■ The Company launched a large-scale project to create a Russian-designed 100-qubit quantum computer.

■ By the end of the year, five digital products came on the market: modules forming part of the Logos software suite (Logos Aero-Hydro and Logos Thermo), the Volna ('Wave') programming and computing system, the Kalininsky Data Centre and the Technical Documentation E-Shop.

■ A new version of the Innovative Development and Technological Modernization Programme was prepared; it includes national projects, prioritized projects promoting scientific and technological development in the nuclear industry, and innovative digital transformation projects.

■ The Company started pilot operation of the first Russian-made multi-powder 3D printer with two laser sources.

■ The team of the Russian nuclear industry won the WorldSkills Hi-Tech National Competition for the fifth time.

■ No events rated at level 1 or higher on the international INES scale were detected at nuclear facilities (level 0 deviations do not pose a risk to employees operating the facilities, local residents or the environment).

■ In March 2020, the Adygea Wind Power Plant started to supply electricity to the Russian wholesale market. This is the Company's first wind farm, which comprises 60 wind turbines with a total installed capacity of 150 MW.

KEY RESULTS IN 2019

INDICATOR	2017	2018 ³	2019	2019/2018
Revenue under IFRS, RUB billion	747.5	788.1	886.8	+12.5%
EBITDA ⁴ , RUB billion	292.2	243.7	346.6	+42.2%
Profit under IFRS, RUB billion	116.1	210.2	140.4	-33.2%
Assets under IFRS, RUB billion	2,893.8	3,196.2	3,403.4	+6.5%
Intangible assets, RUB billion	92.5	182.2	157.6	-13.5%
Nuclear power generation, billion kWh	202.9	204.3	208.8	+2.2%
NPP capacity factor, %	83.3	79.9	80.4	–
Uranium resources ⁵ , kt	523.9 (+216.2)	520.7 (+197.1)	512.7 (+192.0)	–
Uranium production, tonnes	8,019	7,289	7,528	+3.3%
Overseas NPP construction projects, number of power units ⁶	33	36	36	–
Portfolio of orders for new products (outside the scope of the nuclear industry), RUB billion ⁷	814.1	1,082.6	1,169.1	+8.0%
Average salary in JSC Atomenergoprom, RUB '000 per month	78.2	85.3	88.15	+3.3%
Events rated at level 2 and above on the INES scale, number	0	0	0	–

³ Data on profit, assets and intangible assets for 2018 has been recalculated due to the fact that in October 2019, a subsidiary of JSC Atomenergoprom acquired a 100% shareholding in JSC NFCL from ROSATOM and acquired control over the entity; JSC Atomenergoprom acquired additional share issues of JSC SSC RIAR, JSC FCS&HT SNPO Eleron and JSC Administrative Building Management Company. As a result, the Company increased its interest in the authorized share capital of these organizations and acquired control over them. Given that JSC SSC RIAR, JSC FCS&HT SNPO Eleron, JSC Administrative Building Management Company and JSC NFCL had been controlled by ROSATOM, these transactions have been recorded in consolidated financial statements as transactions under common control, and, accordingly, the comparative data of the statement of financial position for 2018 has been retrospectively adjusted. In addition, comparative data for 2018 has been recalculated in order to reflect the effect of fair value measurement of assets and liabilities recognized as at the date of acquisition of control over JSC CONCERN TITAN-2.

⁴ EBITDA = Operating results + Impairment of receivables + Depreciation and amortization + Adjustments for non-cash items of other expenses and income. Data for 2018 has been recalculated.

⁵ The lower line with a '+' sign shows the data on uranium resources of Uranium One; this data is shown separately due to the differences in the calculation methodology used for Russian and foreign assets.

⁶ Including the project portfolio of ROSATOM.

⁷ Including the order portfolio of ROSATOM.

FINANCIAL AND ECONOMIC RESULTS

KEY FINANCIAL RESULTS

CONSOLIDATED FINANCIAL RESULTS OF JSC ATOMENERGOPROM UNDER IFRS, RUB billion

	2017	2018 ⁸	2019	2019/2018, %
Revenue	747.5	788.1	886.8	112.5
Cost of sales	(478.4)	(496.4)	(548.0)	110.4
Gross profit	269.1	291.7	338.8	116.1
Selling and administrative expenses	(79.5)	(86.2)	(93.8)	108.8
Other income/(expenses), net	(26.5)	(19.4)	(37.3)	192.3
Financial income/(expenses), net	(12.1)	24.6	(21.3)	(86.6)
Share of net (loss)/profit of equity accounted investees	2.9	0.8	0.5	62.5
Gain from change in accounting approach of joint ventures	–	46.9	–	–
Income tax expense	(37.8)	(48.2)	(46.5)	96.5
Profit for the year	116.1	210.2	140.4	66.8
Other comprehensive income/(expenses)	(4.0)	21.5	(27.0)	(125.6)
Total comprehensive income for the year	112.1	231.7	113.4	48.9
Net operating profit after tax (NOPAT)	125.3	137.9	161.2	116.9

⁸ Hereinafter in this section, data for 2018 has been recalculated due to the fact that in October 2019, a subsidiary of JSC Atomenergoprom acquired a 100% shareholding in JSC NFCL from ROSATOM and acquired control over the entity; JSC Atomenergoprom acquired additional share issues of JSC SSC RIAR, JSC FCS&HT SNPO Eleron and JSC Administrative Building Management Company. As a result, the Company increased its interest in the authorized share capital of these organizations and acquired control over them. Given that JSC SSC RIAR, JSC FCS&HT SNPO Eleron, JSC Administrative Building Management Company and JSC NFCL had been controlled by ROSATOM, these transactions have been recorded in consolidated financial statements as transactions under common control, and, accordingly, the comparative data of the statement of financial position for 2018 has been retrospectively adjusted. In addition, comparative data for 2018 has been recalculated in order to reflect the effect of fair value measurement of assets and liabilities recognized as at the date of acquisition of control over JSC CONCERN TITAN-2.

In 2019, revenue increased by 12.5% year on year, or by RUB 98.7 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 sales volumes;
- An increase in revenue from sales of uranium products and enrichment services by the Sales and Trading operating segment (as a result of additional shipments to foreign markets and a rise in annual average exchange rates of major currencies during the reporting period);
- An increase in revenue from NPP construction projects.

In 2019, JSC Atomenergoprom's enterprises recorded profit totalling RUB 140.4 billion, down by RUB 69.8 billion (33.2%) compared to 2018. Changes in profit were driven primarily by the recognition of one-off income totalling RUB 46.9 billion in

the first quarter of 2018, which was related to the recognition of two uranium mining joint ventures in Kazakhstan as a joint operation under IFRS 11 Joint Arrangements. In addition, a decrease in profit by RUB 49.8 billion was due to a mixed impact of changes in exchange rates during the periods in question. Under comparable conditions, excluding these factors, profit would have increased by RUB 17.0 billion (12.5%).

As a result of the above factors, as well as an increase in foreign exchange losses on the conversion of indicators of foreign companies into the Russian rouble (the consolidated reporting currency), the total comprehensive income for 2019 fell by 51.1% to RUB 113.4 billion.

STRUCTURE OF REVENUE FROM SALES TO EXTERNAL CUSTOMERS BY OPERATING SEGMENT

OPERATING SEGMENT	2017		2018		2019	
	RUB BILLION	% OF THE TOTAL	RUB BILLION	% OF THE TOTAL	RUB BILLION	% OF THE TOTAL
Electricity Generation	417.3	55.7	429.1	54.3	507.0	57.1
Trading	128.4	17.2	137.9	17.5	142.9	16.1
Fuel Company	85.8	11.5	81.0	10.3	82.1	9.3
Machinery	55.1	7.4	55.4	7.0	58.6	6.6
Mining	4.2	0.6	3.0	0.4	3.7	0.4
Other segments	56.7	7.6	81.8	10.4	92.6	10.4
TOTAL	747.5	100	788.1	100	886.8	100

COST OF SALES

COST STRUCTURE, RUB billion

COST OF SALES	2017	2018	2019	2019/2018, %
Materials and fuel expense	101.3	132.8	157.8	118.8
Personnel costs	105.4	114.7	132.2	115.3
Cost of electricity purchased for resale and for own use	54.2	37.1	37.3	100.5
Electric energy transfer services	26.2	25.7	26.0	101.2
Depreciation and amortization expense	93.6	88.0	101.8	115.7
Production services of third party contractors	19.1	23.8	28.6	120.2
Property tax and other taxes and payments into the budget	20.6	23.6	19.8	83.9
Other expenses	46.8	52.9	64.1	121.2
Changes in finished goods and work and progress	11.2	(2.2)	(19.6)	890.9
TOTAL	478.4	496.4	548.0	110.4

The cost of sales increased by RUB 51.6 billion (10.4%), with the growth driven mainly by the following items:

- personnel costs (RUB 17.5 billion),
- depreciation and amortization (RUB 13.7 billion),
- changes in provisions for spent nuclear fuel (including last cores), mainly due to a decrease in the discount rate in the reporting period (RUB 9.9 billion).

STRUCTURE OF THE STATEMENT OF FINANCIAL POSITION

KEY CHANGES IN THE ASSET STRUCTURE, RUB billion

	DECEMBER 31, 2017	DECEMBER 31, 2018	DECEMBER 31, 2019
Other current assets	21	24	39
Cash	228	372	261
Loans issued	102	94	86
Accounts receivable	323	309	374
Inventory	142	150	189
Other non-current assets	84	117	172
Financial investments	138	147	196
Intangible assets	92	182	158
Property, plant and equipment	1,730	1,758	1,890
Goodwill	34	43	38
TOTAL	2,894	3,196	3,403

An increase in the book value of property, plant and equipment by RUB 132 billion was related primarily to investments in NPP construction in Russia and Turkey.

Financial investments increased by RUB 49 billion due to the acquisition of long-term bank promissory notes and to the fact that in December 2019, JSC Atomenergoprom acquired a 30% shareholding in LLC Management Company Delo (a holding company managing companies providing stevedoring, transportation, logistics and bunkering services).

Other non-current assets increased by RUB 55 billion, mainly due to an increase in bank deposits.

Cash decreased by RUB 111 billion.

Inventories increased by RUB 39 billion.

Accounts receivable increased by RUB 65 billion. The most significant changes were related to outstanding payments under commission contracts for the selection of suppliers and the conclusion of contracts for the manufacture and supply of NPP equipment, as well as outstanding payments under long-term contracts for NPP construction abroad.

There were no significant changes in the lines 'Goodwill', 'Intangible Assets', 'Loans Issued' and 'Other Current Assets' in 2019 compared to 2018.

KEY CHANGES IN THE STRUCTURE OF EQUITY AND LIABILITIES, RUB billion

	DECEMBER 31, 2017	DECEMBER 31, 2018	DECEMBER 31, 2019
Other liabilities	83	111	117
Provisions	159	166	262
Accounts payable	414	455	510
Borrowings	185	189	142
Non-controlling interest	283	331	346
Retained earnings	713	873	977
Equity	1,056	1,070	1,050
TOTAL	2,894	3,196	3,403

The non-controlling interest increased by RUB 15 billion, mainly as a result of issuance of additional shares to ROSATOM and the Russian Federation.

Borrowings decreased by RUB 47 billion as a result of loan repayment.

An increase in provisions by RUB 96 billion was caused mainly by a decrease in the discount rate as at December 31, 2019 compared to December 31, 2018.

There were no significant changes in the lines 'Equity' and 'Other Liabilities' in 2019 compared to 2018.

KEY FINANCIAL AND ECONOMIC INDICATORS

Financial sustainability indicator	2017	2018	2019
Debt-to-equity ratio	0.35	0.33	0.33

LIQUIDITY RATIOS

Indicator	2017	2018	2019
Quick ratio	1.67	2.06	1.67
Current ratio	2.13	2.54	2.13

TURNOVER INDICATORS, days

Indicator	2017	2018	2019
Inventory turnover	75	67	70
Accounts receivable turnover	68	63	55
Accounts payable turnover	47	69	93

PROFITABILITY RATIOS, %

Indicator	2017	2018	2019
Return on sales (ROS)	15.6	26.7	15.8
Return on assets (ROA)	4.0	6.6	4.1
Return on equity (ROE)	5.7	9.2	5.9

Profitability ratios decreased in 2019, primarily due to a year-on-year decrease in profit in the reporting period.

CASH FLOW

	2017	2018	2019	2019/2018, %
Cash flow from operating activities before changes in working capital	293.5	306.2	363.8	118.8
Changes in working capital	3.3	34.0	(35.2)	(103.5)
Income tax paid	(35.0)	(58.0)	(59.5)	102.6
Interest paid	(21.0)	(17.8)	(16.8)	94.4
Net cash flow from operating activities	240.8	264.4	252.3	95.4
Capital expenditures	(158.9)	(141.6)	(197.3)	139.3
Other	(59.9)	32.3	(86.1)	(266.6)
Net cash flow used in investing activities	(218.8)	(109.3)	(283.4)	259.3

	2017	2018	2019	2019/2018, %
Net changes in total debt	(100.7)	(18.3)	(40.0)	218.6
Proceeds from share issue	1.8	—	—	—
Repayment of lease liabilities	—	—	(3.0)	—
Dividends paid	(10.3)	(18.4)	(19.7)	107.1
Net cash flow used in financing activities	(109.2)	(36.7)	(62.7)	170.8
Net (decrease)/increase in cash and cash equivalents	(87.2)	118.4	(93.8)	(79.2)
Cash and cash equivalents at the beginning of the reporting period	312.1	228.3	371.7	162.8
Effect of movements in foreign exchange rates on cash and cash equivalents	2.7	25.0	(17.1)	(68.4)
Cash and cash equivalents at the end of the reporting period	227.6	371.7	260.8	70.2

In 2019, cash totalling RUB 2 billion (RUB 17 billion in 2018) 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 2019, payments for financing activities exceeded proceeds from financing activities by RUB 62.7 billion. This was due to the repayment of borrowings and payment of dividends.

In 2019, the Company financed its investing activities mainly with cash flow from operating activities.

TARGETS FOR 2020

According to JSC Atomenergoprom's forecasts, in 2020, the Company's revenue is projected to total RUB 931.8 billion, while assets are expected to reach RUB 3,678.4 billion.

BUSINESS STRATEGY

2



2.1. BUSINESS STRATEGY UNTIL 2030

2.1.1. BUSINESS CONTEXT

TRENDS IN THE DEVELOPMENT OF THE NUCLEAR INDUSTRY

The nuclear industry is influenced by a number of factors, including⁹:

- Global population growth from 7.8 billion people in 2019 to 10 billion people in 2050 and an increase in the share of urban population from 55–56% to 68% by 2050;
- Global GDP growth by an average of 2.4% per year until 2050;
- Growth of global electricity consumption. Global electricity consumption is expected to increase by 26% compared to 2019 and reach 34.1 TWh as early as in 2030. Asian countries

will lead the growth, with electricity consumption in the region increasing by a factor of 1.4 (from 13 TWh to 18 TWh). In Russia, electricity consumption is expected to grow by 0.9% per year until 2030;

■ Accelerating greenhouse gas accumulation. Global carbon dioxide emissions total about 33 billion tonnes per year and continue to grow. By 2030, carbon dioxide emissions are projected to exceed 34 billion tonnes per year. This drives the active development of low-carbon power generation, which includes nuclear power.

JSC Atomenergoprom has identified two groups of factors that have the most significant impact on the Company's global operations:

- The economic and geopolitical situation. Although global economic growth outpaces that of the Russian economy, as a global company JSC Atomenergoprom sets itself higher growth targets, given persisting political pressure and a general trend towards growing protectionism.
- The technological landscape. The Fourth Industrial Revolution that is currently underway across the world is making a significant impact on both global and local players. Its key elements, which JSC Atomenergoprom takes into account when updating its business strategy, include:
 - Large-scale automation of production through active introduction of manufacturing solutions based on fully automated machine work;
 - Customization of production in order to fully meet the customers' individual needs;
 - Consolidation of manufacturing enterprises into integrated 'smart' networks and the development of the Internet of Things in the manufacturing industry, which involves the fullest possible digitization of information exchange;
 - Accelerated development and commercialization of technologies; a shorter life cycle of technologies and products;
 - Development of flexible project management systems.

⁹ Data from the World Bank, the UN, the IEA World Energy Outlook 2018 (New Policy Scenario), EIU, the IAEA, McKinsey, the Energy Research Institute of the Russian Academy of Sciences and the General Layout Plan of Power Facilities until 2035 have been used.

A reduction of fossil fuel reserves contributes 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 450-500 GW, according to different estimates.

The global nuclear power industry will remain competitive in the long run compared to other energy sources¹⁰. 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 CO₂ capturing devices are installed, the LCOE of thermal power plants increases by more than 50%, 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 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 BOO scheme) and building project infrastructure (legal framework, employee training, community relations, etc.).

JSC ATOMENERGOPROM'S COMPETITIVE POSITION¹¹

The competitiveness of services provided by the Company is based on its unique facilities, technical capabilities and human resources, as well as the experience of coordinating R&D and design organizations. 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 projects¹².

¹⁰ See also the section 'Markets Served by Atomenergoprom'.

¹¹ For information on the Company's main competitors, see the section 'Markets Served by Atomenergoprom'.

¹² Including the project portfolio of ROSATOM.

2.1.2. LONG-TERM STRATEGIC GOALS

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 ROSATOM and JSC Atomenergoprom reflects the development model that they have prioritized: 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's operations facilitate the implementation of the global sustainable development agenda. The Company 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 ROSATOM and JSC Atomenergoprom provides general guidelines for the long term, shapes the global vision of the industry and sets a framework for development.

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 its leadership on the global nuclear power market, the Company is currently expanding its footprint in over 50 countries around the world and the long-term portfolio of overseas orders and increasing the corresponding revenue. *For details, see the sections 'International Cooperation' and 'International Business'*;
- To reduce production costs and the lead time. In order to develop the most competitive products, the Company will take further steps to reduce the duration of NPP construction and the levelized 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;



The mission of ROSATOM and JSC Atomenergoprom is to leverage the achievements of nuclear science and modern high technology for the benefit of humanity.

- 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, JSC Atomenergoprom aims to rank among international companies perceived as global technological leaders.

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;
- Preventing the negative environmental impact;
- Ensuring that the development of nuclear power is socially acceptable;
- Developing JSC Atomenergoprom's innovative potential;
- Shaping a corporate culture focused on results and performance improvement;
- Ensuring full compliance with Russian legislation.

KEY STRATEGY IMPLEMENTATION RISKS

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

- Nuclear and radiation risks;
- 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);
- Political risks;
- Technical (project) risks;
- Technological risks (including the risk of shortcomings in technology).

A detailed description and assessment of key risks for 2019 is provided in the section 'Risk Management'.

2.2. SUSTAINABLE DEVELOPMENT MANAGEMENT

In the course of its operations, JSC Atomenergoprom seeks to contribute to the implementation of the global sustainable development agenda. The Company adheres to the 10 principles of the UN Global Compact (ESG principles) and contributes to the achievement of the 17 UN Sustainable Development Goals (SDGs) through its product line and its efforts to ensure the sustainability of internal environmental, social and governance processes.

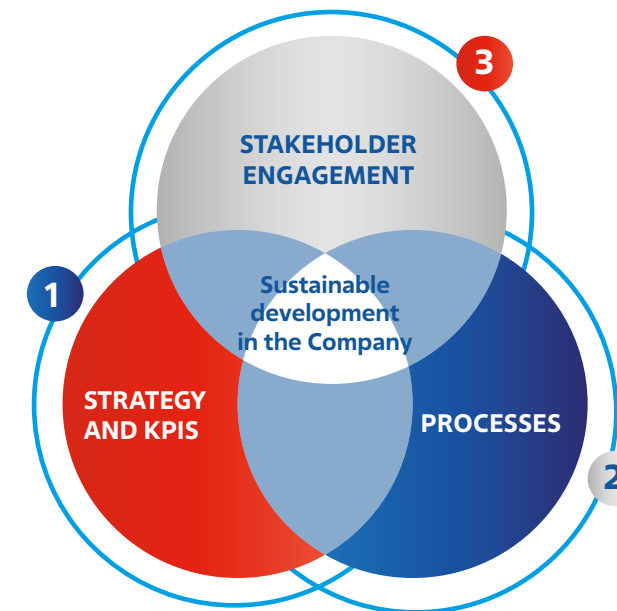
JSC Atomenergoprom has adopted a systematic approach to the development and implementation of sustainability practices. In 2019, ROSATOM established a separate department, the Project Office for Sustainable Development Programmes, and the Expert Panel on Sustainable Development, which serves as a permanent platform for discussing sustainable development matters.

The Company takes part in public events dedicated to sustainable development that are held in Russia and globally. These included the 11th ATOMEXPO International Forum, which took place in April 2019 in Sochi and was focused entirely on sustainable development topics (the forum was attended by representatives of more than 70 countries).

The Company is also taking part in the preparation of Russia's Voluntary National Review on the Achievement of the Sustainable Development Goals, which will be presented in 2020 at the UN High-Level Political Forum.

2.2.1. STRATEGY

As part of an update to ROSATOM's business strategy, in 2019, sustainable development was listed as one of the fundamental business principles. Experts have been engaged to assess



Implementation of sustainability practices in the industry covers the following areas:

- Strategy;
- Operational processes;
- Stakeholder engagement (*see the section 'Stakeholder Engagement'*).

the contribution to the achievement of the 17 SDGs taking into account the scale of impact.

CONTRIBUTION TO SUSTAINABLE DEVELOPMENT

UN SUSTAINABLE DEVELOPMENT GOALS	CONTRIBUTION	ROSATOM'S ACTIONS ON THE STRATEGIC HORIZON
1 No Poverty	Low contribution	Working towards making energy solutions more available and affordable
2 Zero Hunger	Low contribution	Development of irradiation and sterilization systems
3 Good Health and Well-Being	Low contribution	Development of a strategic programme in the sphere of nuclear medicine
4 Quality Education	Medium contribution	Development of educational platforms, including engagement of third parties
5 Gender Equality	Low contribution	Providing men and women with equal opportunities for career development at ROSATOM
6 Clean Water and Sanitation	Low contribution	Development of water treatment and desalination technologies
7 Affordable and Clean Energy	Medium contribution	Improvement of technical and commercial performance of NPPs; development of new energy
8 Decent Work and Economic Growth	Medium contribution	Implementation of business initiatives in new business areas
9 Industry, Innovation and Infrastructure	Medium contribution	Development of industry infrastructure in the countries of operation; development of municipal infrastructure; Northern Sea Route
10 Reduced Inequalities	Low contribution	Making electricity more available and affordable and providing more opportunities for highly skilled labour in all regions of operation
11 Sustainable Cities and Communities	Medium contribution	Development of various aspects of comprehensive municipal management

The level of contribution is shown taking into account the scale of influence and the direct/ indirect nature of ROSATOM's impact on the Sustainable Development Goals:

- Current level of contribution (low/medium/high)
- Potential for development (taking into account the scale of influence)
- Outside the scope of ROSATOM's direct influence

12 Responsible Consumption and Production	Medium contribution	Development of solutions for the management of accumulated spent nuclear fuel and radioactive waste; use of recyclable materials in production
13 Climate Action	Medium contribution	Development of technologies ensuring safe operation of nuclear facilities
14 Life Below Water	Low contribution	Development of environmental initiatives and industrial waste management
15 Life on Land	Low contribution	Development of environmental initiatives and industrial waste management
16 Peace, Justice and Strong Institutions	Low contribution	Development of a regulatory framework governing the use of nuclear technologies on markets served by ROSATOM in accordance with international rules
17 Partnerships for the Goals	Medium contribution	Development of cooperation with partners in Russia and abroad

2.2.2. OPERATIONAL PROCESSES

The Company's sustainable development initiatives include environmental projects and industry-wide public reporting, corporate social responsibility initiatives, development of a supply chain management system, as well as personnel management.

Environmental aspect (E)

The Company is committed to the 'Do No Significant Harm' principle. This principle includes minimizing pollution and the negative impact on ecosystems, reducing water consumption and introducing a closed production cycle. The Company supports initiatives addressing climate change and is committed to ensuring full compliance of its business with international environmental standards.

Over the years, no events rated at level 2 or higher on the international INES scale have been detected at nuclear facilities (level 1 and 0 deviations do not pose a risk to employees operating the facilities, local residents or the environment). A wide range of measures is implemented annually to improve environmental safety and preserve the environment.

A number of corporate environmental documents have been approved in the industry and are updated on a regular basis. The main document in this area is the Uniform Industry-Wide Environmental Policy (2008¹³).

To monitor progress and assess the efficiency of sustainable development processes in the sphere of environmental protection and environmental impacts, Russian nuclear organizations use such indicators as the volume of pollutant and greenhouse gas emissions, water withdrawal and wastewater discharge, industrial and consumer waste generation, the area of restored land, the number of environmentally relevant organizations which use integrated management systems, etc.

Social aspect (S)

The top priority for the Company is to ensure occupational and process safety and to protect the life and health of employees in the industry. The Company is actively implementing its social policy, supports employees' career progression and safeguards their equal rights.

¹³ Hereinafter in this section, the years of approval of the first versions of the documents are stated.

The Company's business development efforts in Russia and on foreign markets are aimed at driving systematic improvements in the standard of living by facilitating long-term and sustainable development in its regions of operation.

In the social sphere, the Company is implementing a wide range of projects aimed at supporting employees in the industry and residents of 'nuclear' towns and cities and promoting public initiatives.

The main corporate documents in the social sphere are the Uniform Industry-Wide Social Policy (2013) and the Single Industry-Wide Policy on Occupational Safety and Health (2013).

To assess the efficiency of sustainable development processes in the social sphere, the Company uses such indicators as the LTIFR, the personnel turnover rate, the number of employees who have undergone training, the gender balance, recruitment of university graduates, the number of employees engaged in NPP construction, contribution to the energy security of Russian regions, the number and value of contracts signed with small and medium-sized enterprises, etc.

Governance aspect (G)

ROSATOM and JSC Atomenergoprom are building an integrated system of industry regulation and sustainable development standards and ensure the transparency of their business by disclosing as much information as possible. In its production processes, the Company focuses on building a 'sustainable' supply chain. It is proactively implementing anti-corruption measures and introducing the principles of ethical business conduct.

ROSATOM's Production System has been developed and is widely used in the industry; it is aimed at promoting a lean manufacturing culture.

2.2.3. TECHNOLOGIES FOR SUSTAINABLE DEVELOPMENT AND THEIR CONTRIBUTION TO THE ACHIEVEMENT OF THE SDGS

Nuclear technology drives systematic improvements in the quality of people's life. Nuclear power generation is sustainable because it is a low-carbon energy source (greenhouse gas emissions over the life cycle of an NPP total 12 grams of CO₂ equivalent per kilowatt-hour on average) and because it makes an important contribution to achieving SDG 7 Affordable and Clean Energy, SDG 8 Decent Work and Economic Growth, SDG 9 Industry, Innovation and Infrastructure, and

A quality management system has been introduced, and the ISO 14001, ISO 9001 and OHSAS 18000 international standards are applied.

In 2019, the Company piloted a supply chain sustainability verification system. JSC TENEX developed a Supplier Code of Conduct and standardized implementation recommendations. A pilot sustainable development audit of suppliers in the industry is scheduled for 2020. The Company plans to replicate this experience in other organizations and enterprises in the industry.

Public sustainability reports are an integral part of the Company's practices to ensure the transparency of its business and a tool for communication with stakeholders. ROSATOM and JSC Atomenergoprom annually publish non-financial reports in accordance with the international GRI Standards.

The main corporate governance documents are 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, Russian nuclear organizations use such indicators as the findings of external audit of performance of the internal control system, the number of employees who have undergone anti-corruption training, financial losses prevented through anti-corruption measures, etc.

SDG 13 Climate Action in the regions where NPPs are built and operated, both in Russia and abroad.

The Company's product portfolio comprises not only conventional solutions in the sphere of nuclear power, but also new areas involving the use of nuclear technology, such as nuclear medicine, radiation processing facilities, nuclear research and technology centres based on research reactors, etc. In addition, the Company is

developing its business in a number of related non-nuclear areas: water treatment, wind power, polymer composite materials, etc.

The Company applies sustainable development approaches in its business areas in the form of pilot projects. Such projects are focused on achieving four types of results: digitizing the SDG

NUCLEAR POWER INDUSTRY

NPP construction and operation contributes to economic and infrastructure development both in Russia and in foreign customer countries. As high-technology manufacturing enterprises are guaranteed long-term stable capacity utilization, companies in related industries receive orders, and new jobs

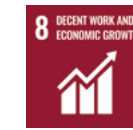
achievement impacts, developing indicators for performance evaluation from the perspective of sustainable development, a sustainable supply chain, and communication practices in the sphere of sustainable development. This practice was adopted in 2019 and will be continued on a regular basis in order to replicate the accumulated experience in industry organizations and business areas.

are created for local communities, all this contributes to GDP through 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.

DETAILED DESCRIPTION OF CONTRIBUTION OF THE NUCLEAR POWER INDUSTRY TO THE ACHIEVEMENT OF THE SDGS



NPPs ensure stable low-carbon power generation for 60 years, with a potential for further life extension.



On average, about 10,000 people are employed in the construction of an NPP with two power units, while its operation provides about 3,000 jobs. Stable large-scale power generation makes a positive systemic impact on the development of local industry in the country where the NPP is located.



NPP construction and operation involves building the relevant infrastructure and developing fundamental and applied science and a national personnel training system.



In NPP construction and operation projects, special focus is given to the management of spent nuclear fuel (SNF), SNF processing products and operational radioactive waste (RAW), as well as to the decommissioning of facilities posing nuclear and radiation hazards. Waste management efforts are focused on preserving the environment and improving environmental safety.



Nuclear power generation is a source of low-carbon energy that provides considerable environmental benefits. The operation of all Russian-design NPPs globally helps to prevent emissions totalling about 210 million tonnes of CO₂ equivalent per year¹⁴.



The nuclear power industry offers solutions for different stakeholders: the government, local communities, industrial enterprises, etc. An open dialogue between all stakeholders is an integral part of successful implementation of NPP projects. The sustainable development agenda is actively discussed on international platforms: at conferences held by the IAEA and the World Nuclear Association (WNA), the World Association of Nuclear Operators (WANO), the World Energy Council, etc.

¹⁴ Estimates by the Company's experts.

WIND POWER

Wind power generation is a low-carbon energy source. According to the Intergovernmental Panel on Climate Change (IPCC), greenhouse gas emissions from onshore wind power plants over their life cycle average 11 grams of CO₂ equivalent per kilowatt-hour. By comparison, greenhouse gas emissions from hydropower plants average 24 grams of CO₂ equivalent per kilowatt-hour, while greenhouse gas emissions from coal-fired power plants are almost 75 times higher than those from wind power plants.



The Company adheres to sustainability principles and seeks to diversify its product offer in the sphere of power generation. As part of these efforts, it has been developing the wind power business jointly with Lagerwey since 2017.

As part of this business, in addition to wind power plant construction, the Company intends to create a technical regulation system, provide personnel training, localize the production of wind turbines, perform certification and carry out R&D. For details, see the sections 'Markets Served by Atomenergoprom' and 'Business Diversification'.

NUCLEAR MEDICINE

Technological solutions currently used in the nuclear industry enable diagnosis and treatment of more than half of all types of cancer. Millions of patients undergo diagnostic procedures and therapy that involve the use of isotope products manufactured by Russian nuclear enterprises: for example, almost 2 million people per year undergo procedures that involve the use of molybdenum-99 and technetium-99.

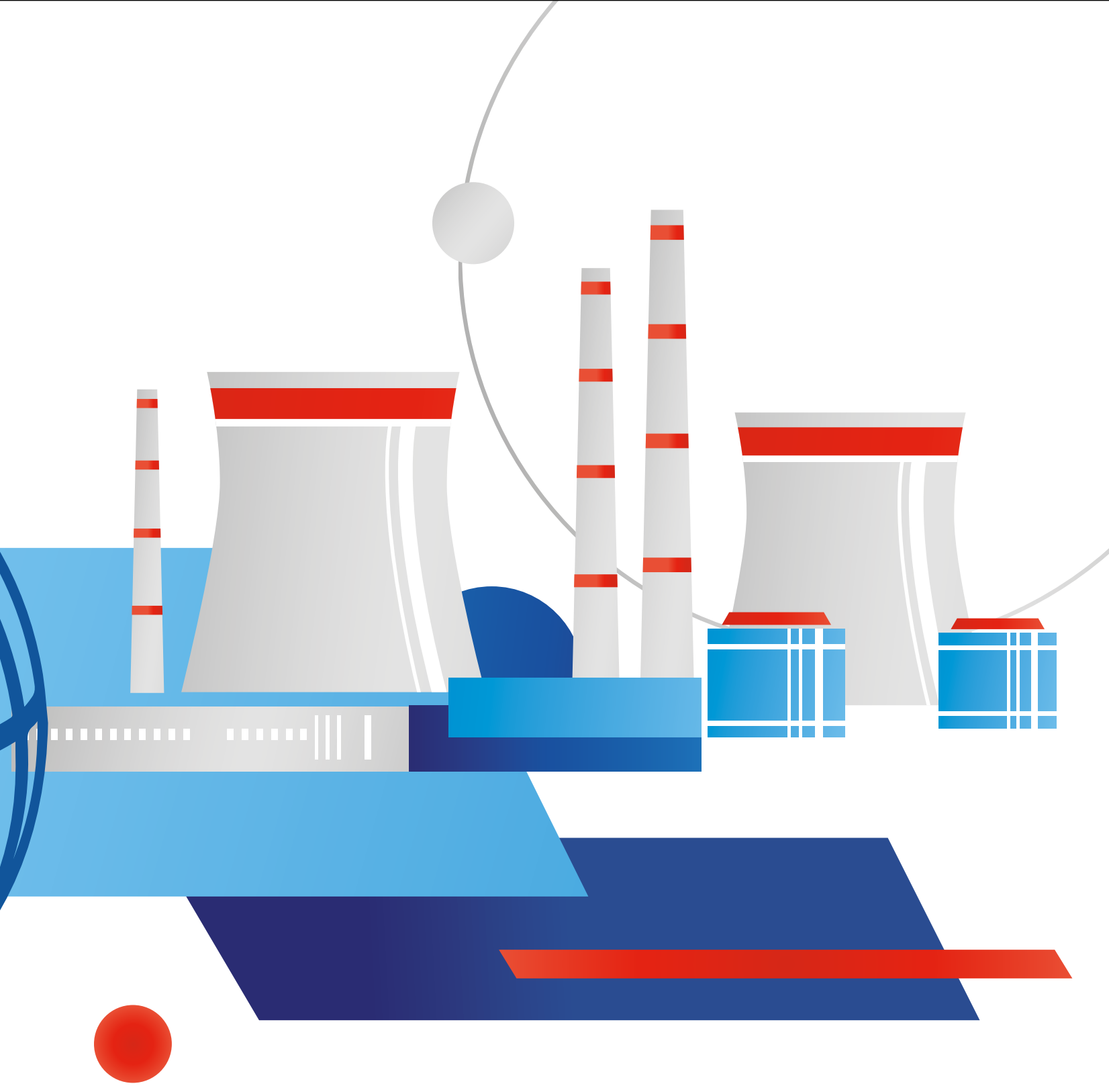
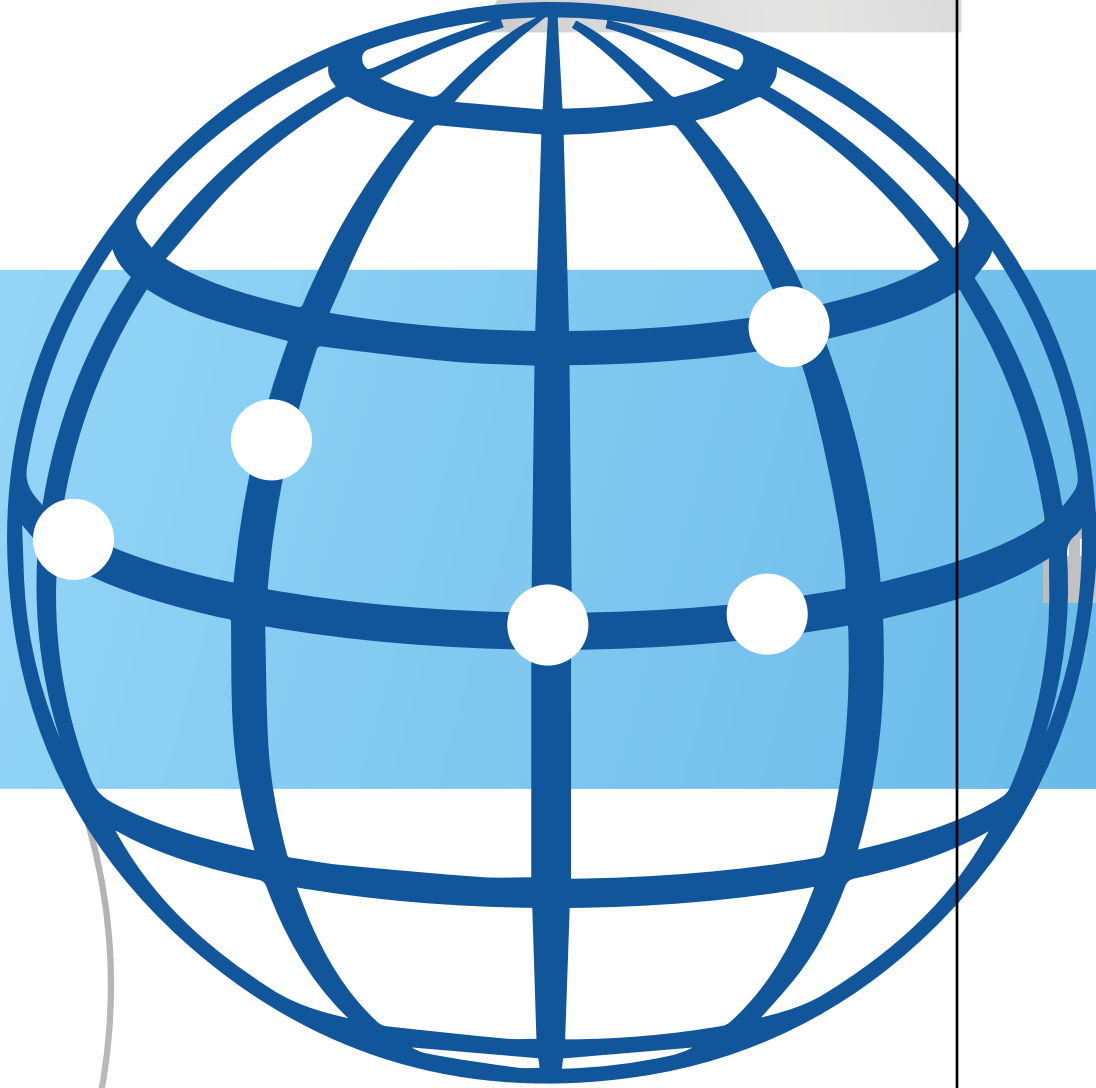
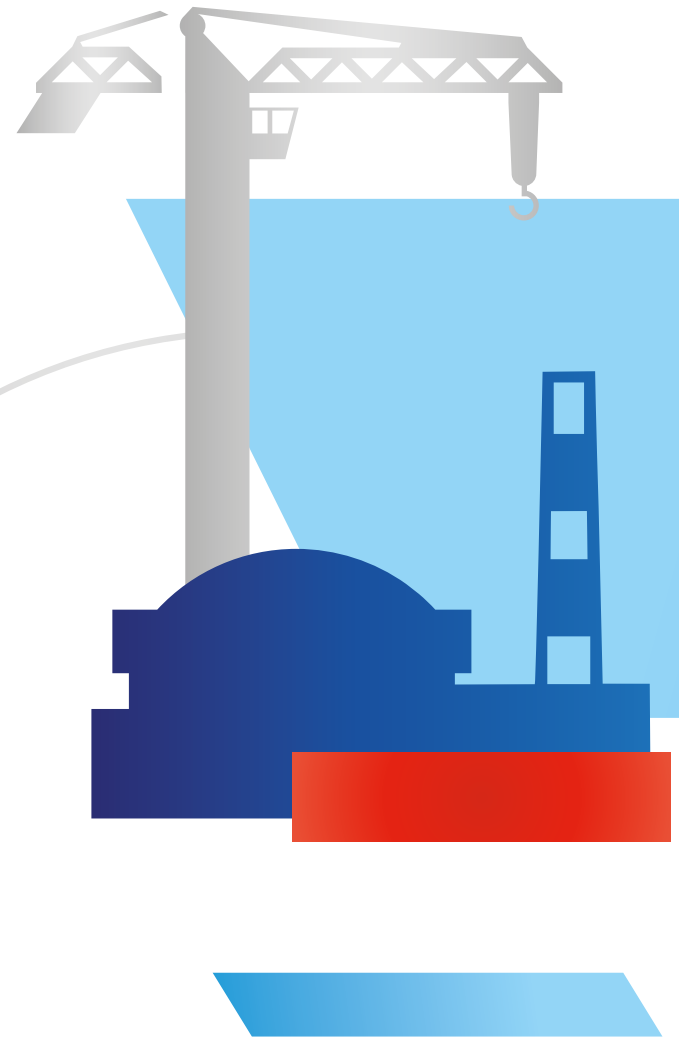


JSC Atomenergoprom offers nuclear medicine technologies and services that enable timely diagnosis and effective treatment of certain types of cancer.

The Company is developing new high-technology equipment and radiopharmaceuticals based on isotopes produced in-house. It supplies solutions for nuclear medicine centres comprising diagnostic and radiotherapy modules worldwide. For details, see the sections 'Markets Served by Atomenergoprom' and 'Business Diversification'.

INTERNATIONAL BUSINESS PERFORMANCE

3



3.1. MARKETS SERVED BY ATOMENERGOPROM

In 2019, JSC Atomenergoprom ranked:

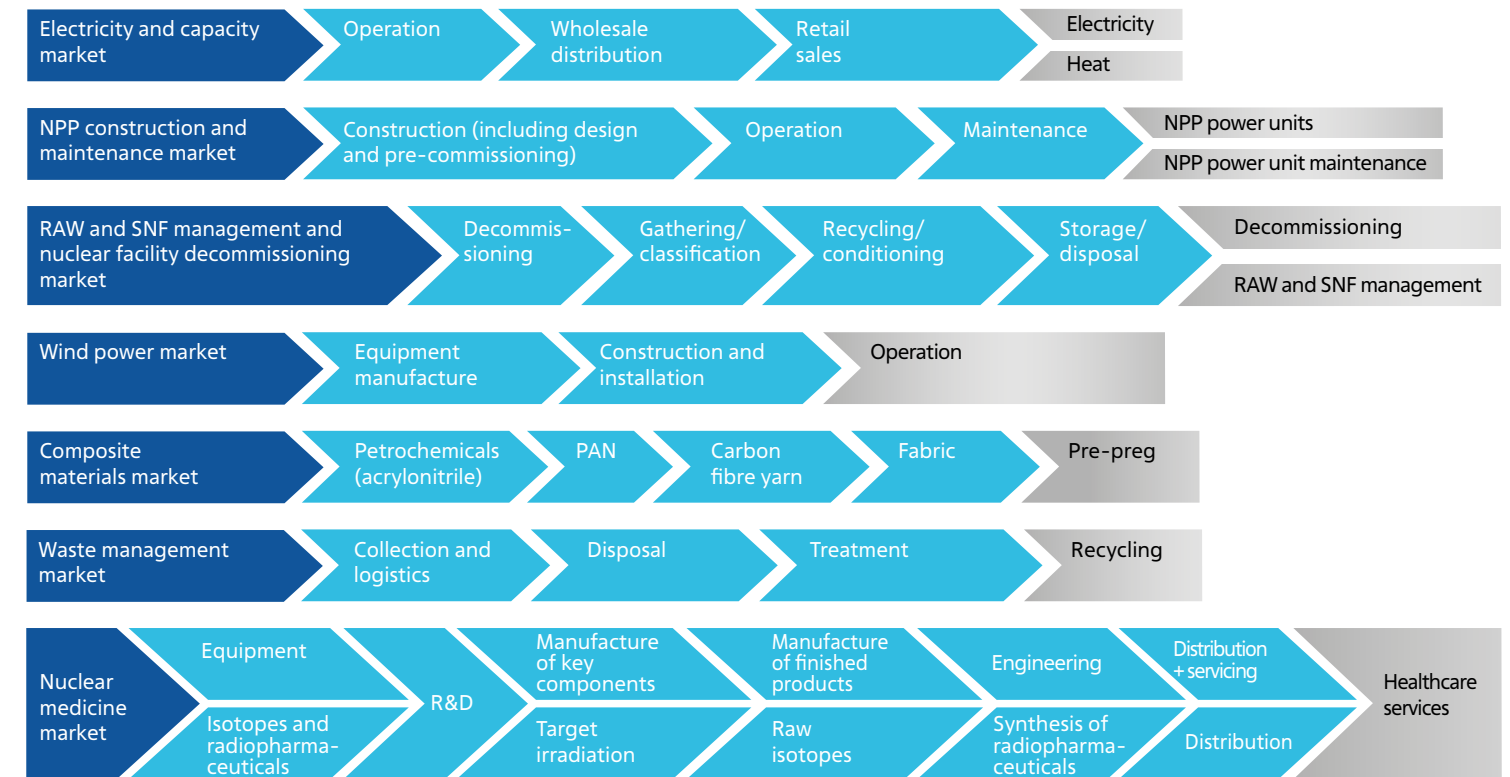
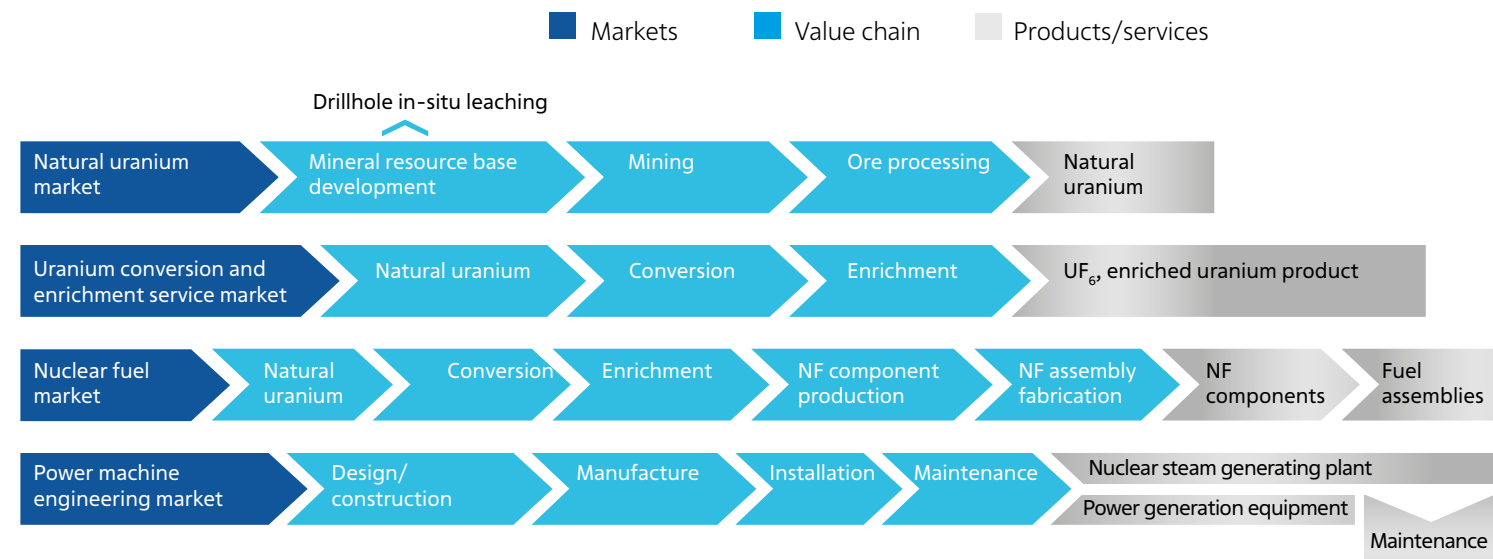
- First in the world in terms of the number of NPP power units in the portfolio of foreign projects*;
- First on the global uranium enrichment market (38%);
- Second in the world in terms of uranium production (14% of the market);
- Third on the global nuclear fuel market (16%).

* Including the project portfolio of ROSATOM.

JSC Atomenergoprom's vision is to become a global technological leader. Accordingly, the Company intends not only to actively 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



3.1.1. TRADITIONAL MARKETS

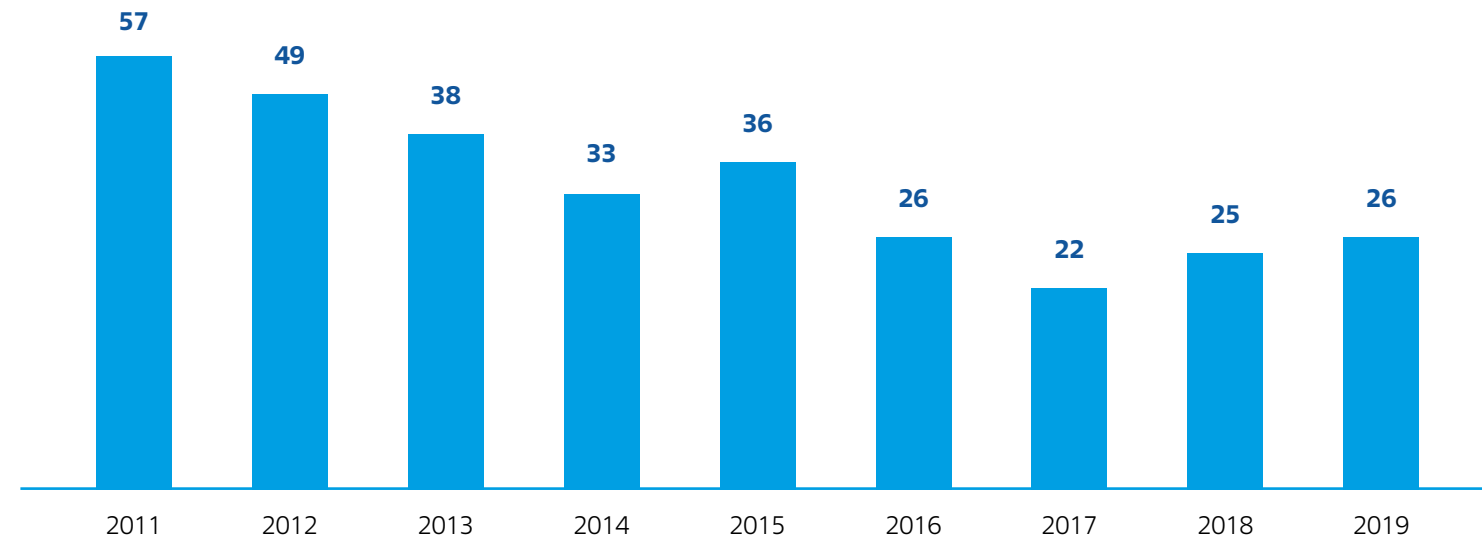
NATURAL URANIUM MARKET

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. Throughout most of 2019, the natural uranium market was characterized by a low level of consumer activity amid

political and trade uncertainty. In the reporting year, spot market quotations averaged USD 25.8/lb of U₃O₈, which is 5% higher than in 2018.

AVERAGE ANNUAL SPOT MARKET QUOTATIONS FOR NATURAL URANIUM, USD/lb of U₃O₈

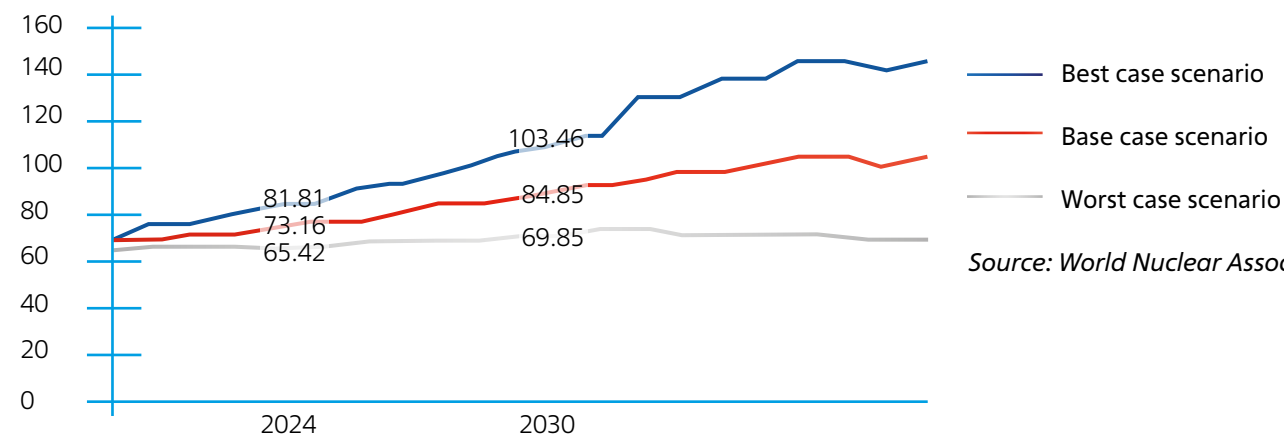


Sources: raw data from UxC¹⁵; average values have been calculated by JSC Atomredmetzoloto

In 2019, global reactor demand for uranium totalled 64,300 tonnes. At the same time, global demand taking into account commercial and strategic stockpiling not intended for current consumption is estimated at 72,000 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 baseline forecast of the World Nuclear Association (WNA), global reactor demand for uranium will increase to 73,000 tonnes by 2024 and to 85,000 tonnes by 2030.

FORECAST FOR CHANGES IN URANIUM DEMAND, kt



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

Natural uranium market overview

In 2019, global uranium production increased by 2% year on year to 53,900 tonnes. Production in Kazakhstan increased in line with targets previously set in some mining contracts. Production growth was also recorded at the Husab mine in Namibia as part of a ramp-up to design capacity.

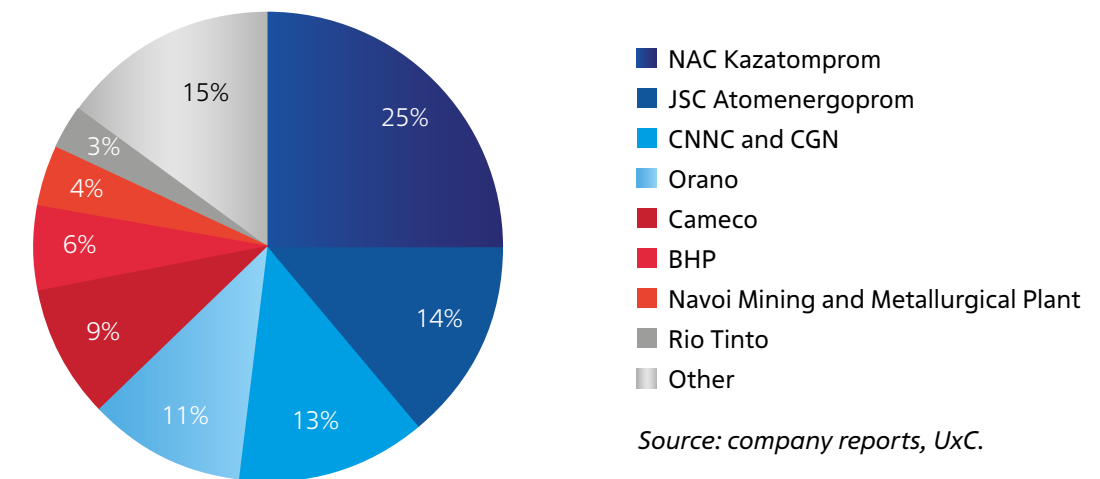
Supplies from secondary sources (inventories of energy companies and some states, reparation of depleted uranium hexafluoride, reprocessed uranium, etc.) are estimated at 20,000 tonnes of natural uranium equivalent¹⁶.

In the reporting year, major producers remained committed to reducing oversupply. The McArthur River mine in Canada (the world's largest enterprise with a capacity of about 7,000 tonnes of uranium per year) and the Langer Heinrich mine in Namibia remained on care and maintenance. Production decreased in the US, Niger and other countries. Progress on most projects developed by junior companies remained slow due to difficulties with raising funds and arranging product sales.

A stable group of leaders has emerged on the natural uranium market. At year-end 2019, along with JSC Atomenergoprom (14% of the global output), the group also included NAC Kazatomprom (Kazakhstan, 25%), an alliance of CNNC and CGN (China, 13%), Orano¹⁷ (France, 11%), Cameco (Canada, 9%), BHP (Australia – United Kingdom, 6%), Navoi Mining and Metallurgical Plant (Uzbekistan, 4%) and Rio Tinto (Australia – United Kingdom, 3%). The eight largest market players account for 85% of the total uranium output.

According to the UxC forecast¹⁸, in 2020, global uranium production will total 54,700 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 2030¹⁹.

LARGEST PLAYERS ON THE NATURAL URANIUM MARKET IN 2019



Source: company reports, UxC.

¹⁶ Provisional data from UxC (UMO 4Q 2019). The data will be revised following the publication of the UxC UMO report for 1Q 2020.

¹⁷ 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.

¹⁸ Report by UxC (UxC UMO 1Q 2020).

¹⁹ Report by UxC (UxC UMO 1Q 2020).

URANIUM CONVERSION AND ENRICHMENT MARKET

Products offered on the market include uranium hexafluoride (UF₆), 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 2019, global reactor demand for uranium conversion totalled about 65,000 tonnes.

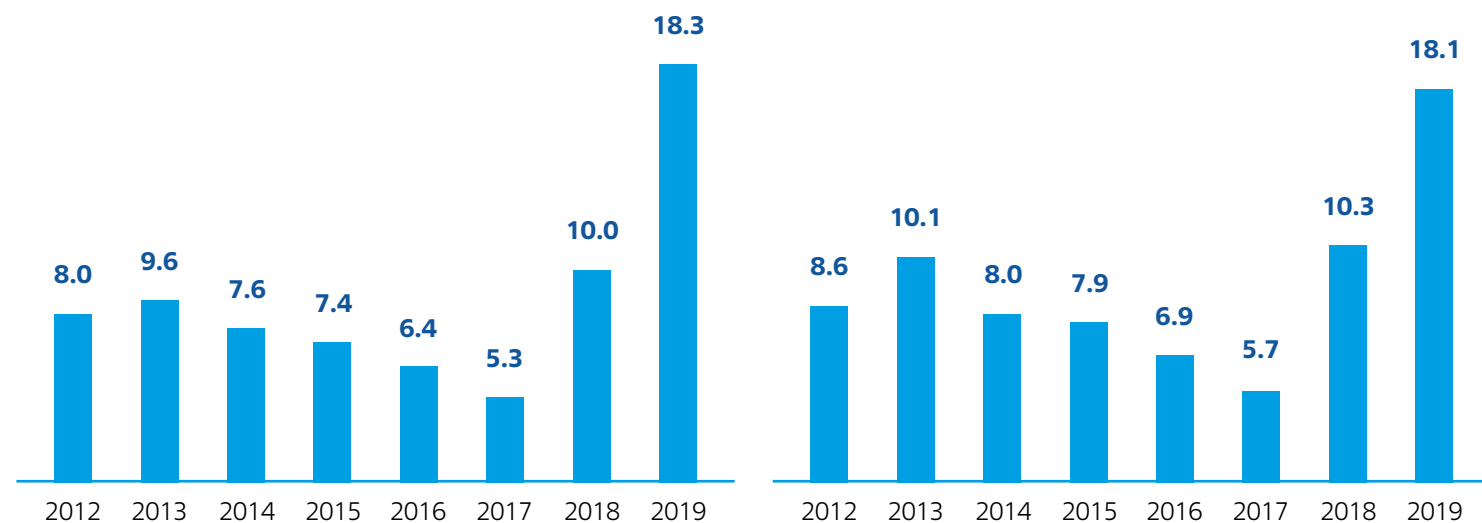
In 2019, average annual spot quotations on the North American and European markets soared by 83% and 76% respectively,

while average annual long-term quotations on these markets increased by 17% and 15% respectively. This was the result of primary supply deficit combined with rapid growth of buying interest.

AVERAGE ANNUAL SPOT MARKET QUOTATIONS FOR CONVERSION SERVICES, USD/kg of uranium

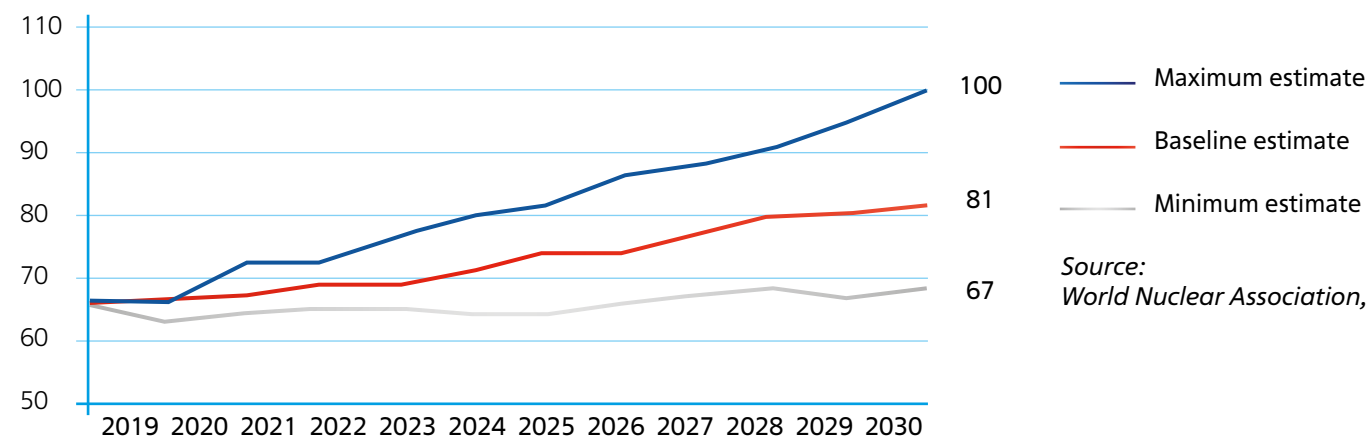
On the North American market

On the European market



The development of the nuclear industry 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, kt



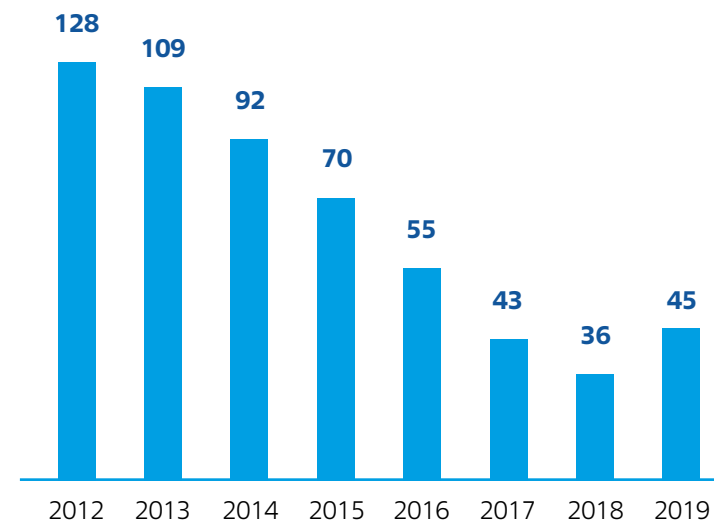
Source: World Nuclear Association, 2019.

Forecast for changes in demand for uranium enrichment services by 2030

According to JSC Atomenergoprom's estimates, global reactor demand for enrichment totalled about 56 million SWU in 2019. Amid gradual rebalancing of supply and demand on the

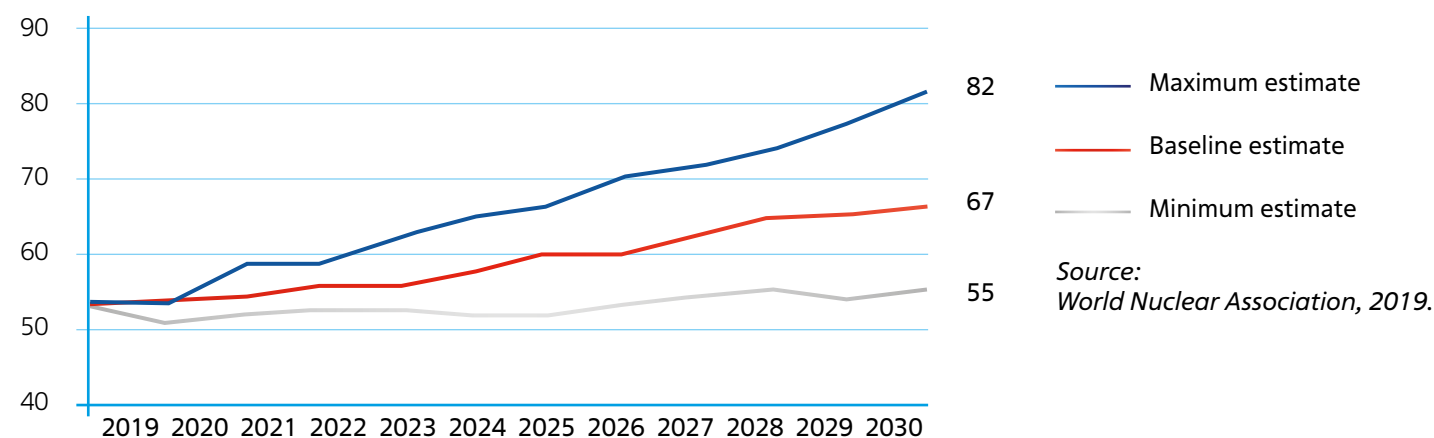
uranium enrichment market, in 2019, average annual spot market quotations rose by 25%, while long-term quotations increased by 11%.

AVERAGE ANNUAL SPOT MARKET QUOTATIONS FOR ENRICHMENT, USD/SWU



The development of the nuclear industry 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.

FORECAST FOR CHANGES IN DEMAND FOR URANIUM ENRICHMENT BY 2030, million SWU



Uranium conversion and enrichment market overview

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

market), URENCO (UK, Germany, Netherlands; 29%), Orano (France; 14%) and Chinese companies (10%). Together, they control about 90% of the market. At present, all players use modern gas centrifuge technology for uranium enrichment.

The main players on the global market for uranium enrichment services include JSC Atomenergoprom (38% of the global

NUCLEAR FUEL FABRICATION MARKET

According to the Company, in 2019, 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 7,400 tHM (including over 1,000 tHM of fuel for water-cooled water-moderated power reactors (VVERs));
- Fuel for heavy-water reactors accounting for 3,500 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 JSC Atomenergoprom.

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.

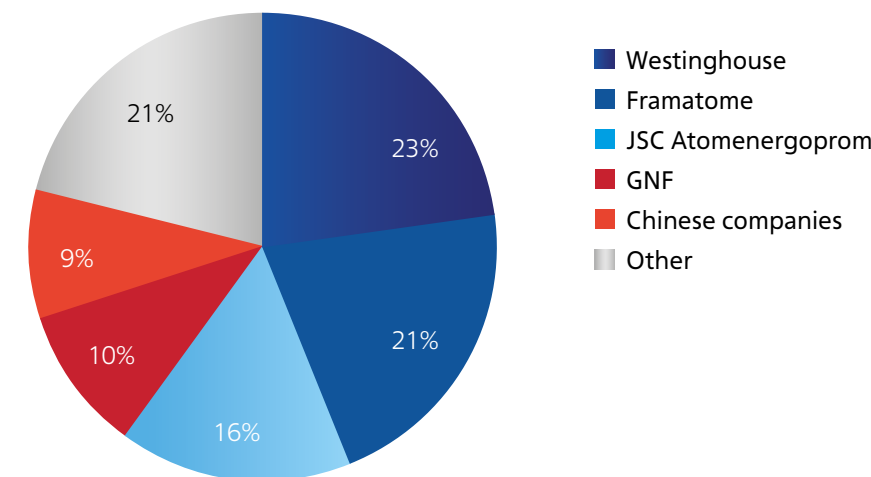
The French Framatome produces fuel for PWR and BWR reactors and holds 21% of the global fabrication market, with Western Europe being its main end market.

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 10% of the market.

In 2019, JSC Atomenergoprom’s share on the global nuclear fuel fabrication market totalled 16%. In the reporting year,

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. JSC Atomenergoprom, in cooperation with Framatome, also supplies fuel and components from reprocessed uranium to Western European NPPs.

SHARES OF PLAYERS ON THE NUCLEAR FUEL FABRICATION MARKET, %



Entering new nuclear fuel markets

In 2019, the Company continued to take steps towards entering the markets for fuel for Western-design power reactors, and fuel and components for Western-design research reactors.

A separate promising area is the manufacture of fuel for fast neutron reactors. In 2019, the first batch of MOX fuel assemblies was loaded into the BN-800 reactor.

The Company continues to implement the Proryv (Break-through) Project. It involves building a fuel fabrication and refabrication module, which will produce mixed nitride uranium-plutonium fuel. 2019 saw the start of construction of a generation IV lead-cooled fast neutron reactor, BREST-OD-300.

See also the section ‘Research and Innovations’.

POWER MACHINE ENGINEERING MARKET

The modern power machine engineering market is characterized by long lead times, high capital intensity and design for manufacturability. The global power machine engineering market is affected by trends in the development of the global electricity industry (improved energy efficiency, environmental programmes, etc.) and the commissioning of new generating capacities.

In 2019, the volume of the global market for commissioned power generation equipment totalled about 221 GW²⁰. The shares of different types of commissioned power generation equipment (in physical terms, GW) were distributed as follows: equipment for increasing the thermal power generation capacity accounted for 74%, while the shares of equipment for the renewable energy sector, hydropower and the nuclear power industry stood at 14%, 9% and 3% respectively.

At the same time, the shares of power generation equipment that is already in operation were distributed as follows: equipment for thermal power generation accounted for 64%, while the shares of hydropower, renewable energy and nuclear power generation equipment stood at 19%, 11% and 6% respectively.

NPP CONSTRUCTION AND OPERATION MARKET

According to forecasts by international agencies and analysts²¹, an accelerating shift towards low-carbon energy is becoming the key trend in the development of global energy markets. Renewable energy is expected to replace carbon-based energy in the energy mix by 2030.

In 2019, the nuclear power industry accounted for about 11% of the global electricity supply. According to the IAEA²², in 12 states, more than a quarter of the electricity demand is met by nuclear power generation. Countries with the largest share of nuclear power generation include France (70.6%), Slovakia (53.9%) and Ukraine (53.9%).

The Russian power machine engineering market is affected by trends in the development of the global power machine engineering market, the economic situation in Russia and the DPM-2 modernization programme. According to the Federal State Statistics Service, in 2019, the production of new power generation equipment on the Russian power machine engineering market decreased by 12% to 20.4 GW. However, not all market segments saw a decline. The production of industrial gas turbines increased by 11% to 704 MW. By contrast, the steam turbine segment declined by 52% to 974 MW; the production of hydraulic turbines and water wheels decreased by 47% to 336 MW, while the production of central heating boilers (including hot-water and low-pressure steam boilers) decreased by 7% to 18.4 GW.

According to the Federal State Statistics Service, in 2019, the shares of key players on the Russian power machine engineering market remained unchanged. JSC Atomenergomash (the Company's Mechanical Engineering Division) accounted for 38% of production of key types of power generation equipment, ranking first on the Russian market.

According to the IAEA, as at December 31, 2019, 443²³ power reactors with a total capacity of 392 GW were in operation (including the suspended Japanese reactors). Another 52 reactors were under construction. In 2019, the number of power units in operation in Russia, including the newly commissioned power unit No. 2 of Novovoronezh NPP-2, reached 36, with their capacity totalling 30.3 GW. In 2019, JSC Atomenergoprom ranked second among nuclear power generation companies globally in terms of installed NPP capacity, surpassed only by the French EDF.

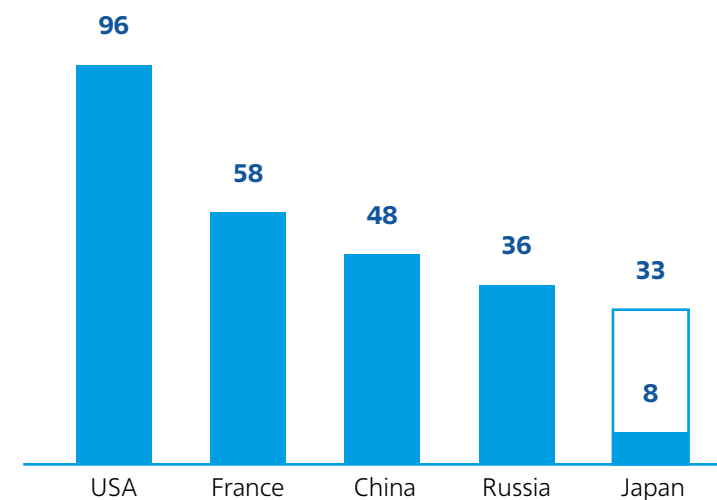
²⁰ According to a survey by the Industrial Marketing Research Group: Power Generation Equipment Market in 2020.

²¹ Sources: WTO, EY, WEO 2019 (Sustainable Development Scenario).

²² Power Reactor Information System (PRIS) developed by the IAEA (<https://pris.iaea.org>).

²³ Including a floating thermal nuclear power plant, which was in pilot operation at the end of 2019.

LEADING COUNTRIES BY THE NUMBER OF OPERATING NPP POWER UNITS



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 2019 totalled 5.2 GW. At present, demand for NPP construction comes primarily from Asian countries, which is due to rapidly growing electricity consumption in this region. JSC Atomenergoprom is taking active steps to expand its footprint on the overseas market as a major global player.

OVERSEAS NPP SERVICING MARKET

The Company provides maintenance services for 49 Russian-design power units abroad that are currently in operation or at the design/construction stage.

The Company's key rivals on this market include JNPC (China), NPCIL (India) and Skoda J.S. (Czech Republic).

JSC Atomenergoprom is a market leader in China, Bulgaria and Armenia, acting as a general contractor for life extension, scheduled preventive maintenance and equipment modernization at NPPs equipped with VVER reactors. To consolidate its position on the NPP servicing market in these countries, the Company is considering localization through partnerships and joint ventures with local players, as well as the acquisition of local service companies.

See also the section 'International Business'.

3.1.2. NEW MARKETS

MARKET FOR RAW AND SNF MANAGEMENT, PROCESSING AND DISPOSAL

In 2019, the volume of SNF accumulated globally totalled 293,000 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 temporary waste storage market.

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

The Company promotes its own RAW and SNF storage 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 JSC Atomenergoprom are the leaders on the SNF processing market. The Company's development plans involve an expansion of its SNF processing capacities. The development of this market is closely linked to the improvement of the relevant technologies and the use of regenerated SNF

MARKET FOR THE DECOMMISSIONING OF FACILITIES POSING NUCLEAR AND RADIATION HAZARDS

By 2019, more than 170 power units had been shut down in the world. According to the Company's estimates, by 2030, the number of shut-down power units will almost double (the NPP construction activity peaked in the 1970s and 1980s, and by 2030 the service life of many units will have reached 60 years). Most countries have opted for 'postponed decommissioning', i.e. maintaining NPPs in a safe condition for a long time in order to reduce radiation levels and improve the decommissioning technology. Only a few countries, including the US and Germany, begin the decommissioning process immediately after a unit has been shut down. Some European Union countries (e.g. Belgium) are also making statements about 'accelerated decommissioning'.

ELECTRICITY MARKET

In 2019, NPPs accounted for 19% of the total electricity output in Russia.

In the reporting year, JSC AtomEnergSbyt (an organization of JSC Atomenergoprom) continued to operate as the power

COMPOSITE MATERIALS MARKET

Until 2030, the global carbon fibre market is expected to grow by 10% per year, while the growth rate of the Russian market is projected to exceed 15% per year (in physical terms). A further

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 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.

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.

The Company is preparing to decommission power units of Novovoronezh, Leningrad and Beloyarsk NPPs and is participating in the decommissioning of Philippsburg NPP in Germany, Oskarshamn NPP in Sweden, Kozloduy NPP in Bulgaria and Ignalina NPP in Lithuania.

See also the section 'International Business'.

supplier of last resort in the Kursk, Tver, Smolensk and Murmansk Regions. JSC AtomEnergSbyt provides services to more than 50,000 legal entities and more than 2 million households in Russia.

increase in the global use of composite materials is expected due to replacement of conventional materials and expansion of the areas of application.

Key characteristics of the market include the following:

- Fabrics and pre-pregs account for 75% of demand from manufacturers of finished products;
- The maximum profitability of composite products is achieved in the final stages of the production chain (finished products).

WIND POWER MARKET

The global wind power market is actively developing; installed capacity of wind power plants (WPPs) is expected to increase significantly, from 0.6 TW in 2019 to about 1.0 TW and 1.3 TW in 2024 and 2030 respectively.

The market is highly competitive, with the top five players accounting for 74% of the total installed capacity of onshore and offshore WPPs in 2019.

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

NUCLEAR MEDICINE MARKET

In 2019, the global nuclear medicine market totalled USD 13.2 billion and is expected to reach USD 33.3 billion by 2030, with the shares of equipment and radiopharmaceuticals production almost equal in monetary terms.

The volume of the Russian market exceeds RUB 94 billion, and the market is expected to actively develop until 2030, with growth totalling up to 6-7% per year, according to the Company'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 world's largest carbon fibre manufacturers include Japanese (Toray, Teijin, Mitsubishi Rayon), American (Hexcel, DowAksa, Cytec), German (SGL) and Chinese (Formosa Plastics) companies.

JSC Atomenergoprom is the key Russian manufacturer of carbon fibre.

See also the section 'Business Diversification'.

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 market volume might reach 3.6 GW, with annual turnover totalling USD 1.6 billion.

The portfolio of wind power plants to be built by JSC Atomenergoprom totals 1 GW, or more than 30% of the Russian wind power market.

See also the sections 'Sustainable Development Management' and 'Business Diversification'.

JSC Atomenergoprom 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 sterilization using radiation processing technologies.

JSC Atomenergoprom also produces and actively upgrades medical equipment for external beam radiotherapy and

brachytherapy. By 2025, the Company intends to become a leading supplier of diagnostic and therapeutic equipment on the Russian market.

See also the sections 'Sustainable Development Management' and 'Business Diversification'.

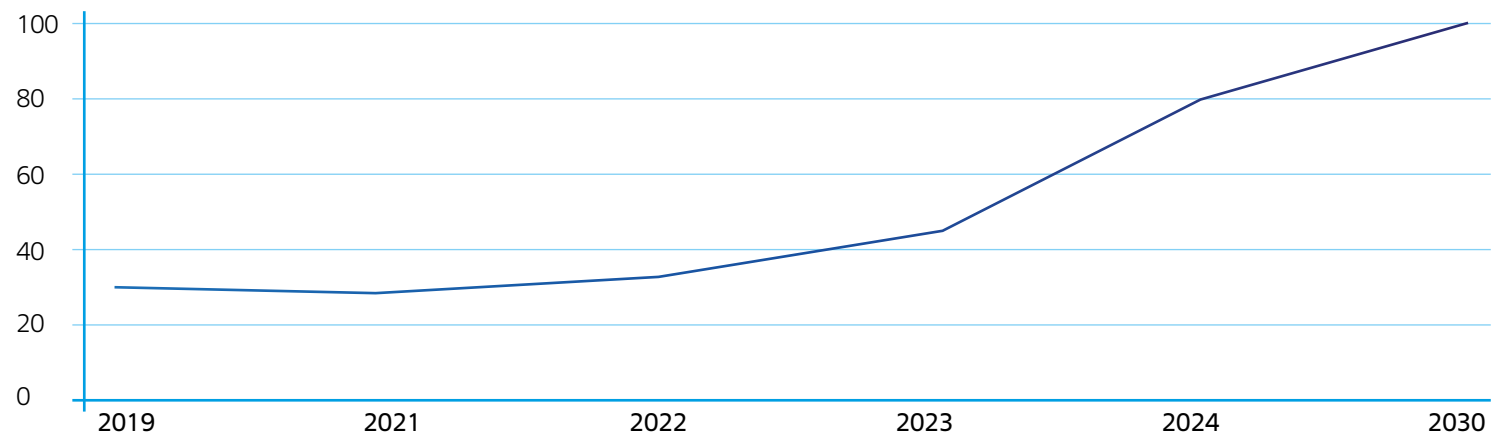
MARKET FOR CARGO TRANSPORTATION ALONG THE NORTHERN SEA ROUTE

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 31.5 million tonnes in 2019 to 100 million tonnes in 2030.

Global cargo traffic can become a growth driver for 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%).

PROJECTED CARGO TRAFFIC ALONG THE NORTHERN SEA ROUTE, million tonnes



Under the Northern Sea Route Federal Project.

WASTE MANAGEMENT MARKET

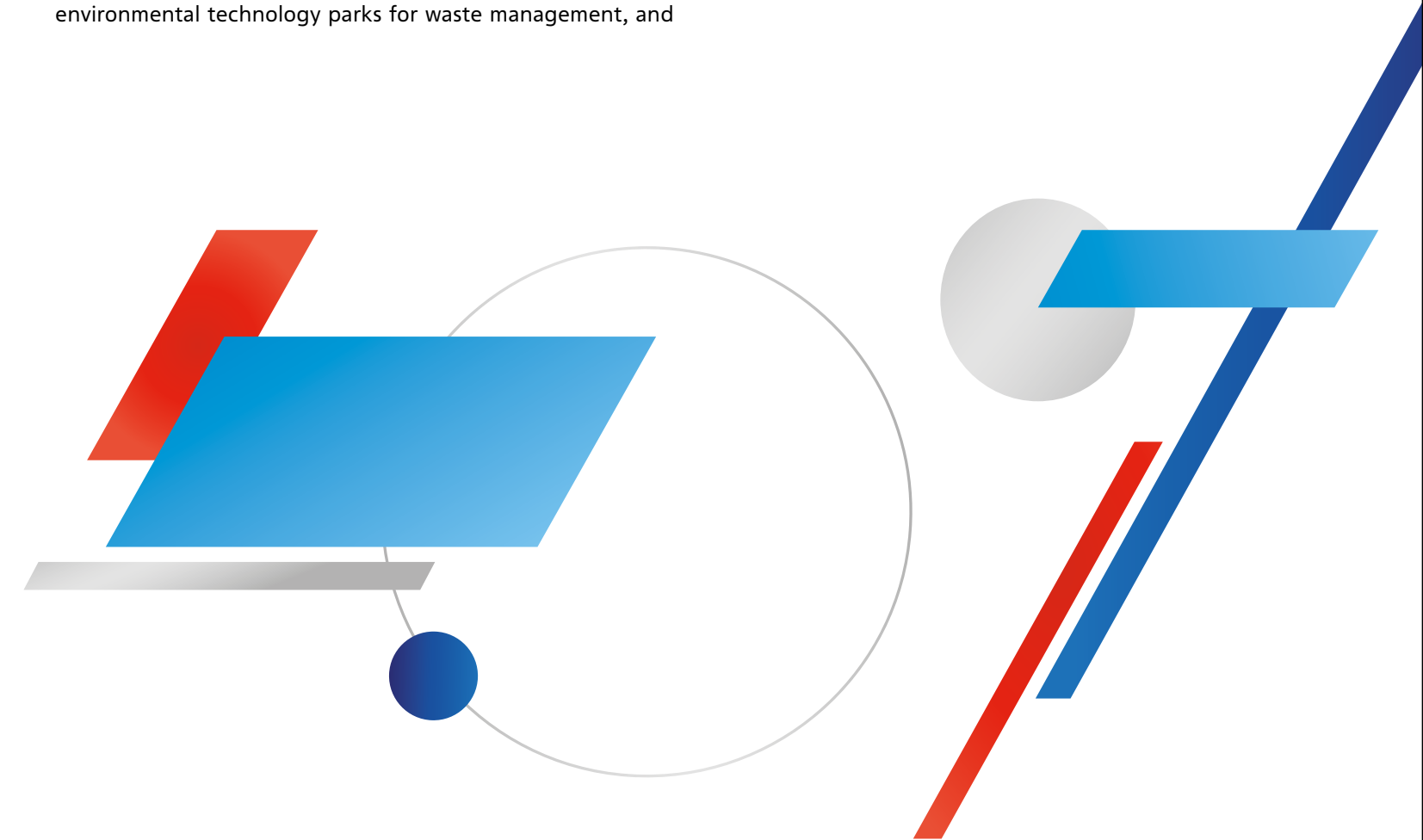
Until recently, the practice of managing highly and extremely hazardous industrial and consumer waste was virtually non-existent in Russia. The country is facing a shortage of capacities for the processing and storage of hazard class 1 and 2 waste. Only a small part of such waste is treated and recycled in an environmentally safe manner by operators that have licences for the relevant operations and the required capacities.

To achieve a fundamental transformation in the sphere of hazardous waste management, 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. ROSATOM and JSC Atomenergoprom are creating environmental technology parks for waste management, and

are developing and implementing a federal scheme and a state information system for managing extremely and highly hazardous waste. The development of a 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.

To develop industry capabilities for the management of waste of all hazard classes, JSC Atomenergoprom is also implementing an investment programme to develop infrastructure for hazard class 3 and 4 waste management. The Company forecasts that the market for hazard class 3 and 4 waste management will reach up to RUB 230 billion by 2024 and up to RUB 320 billion by 2030.

See also the section 'Business Diversification'.



3.2. INTERNATIONAL COOPERATION

JSC Atomenergoprom's international activities are aimed at creating a favourable international legal and political environment to promote Russian nuclear technologies on the global market, strengthen the nuclear safety and non-proliferation regimes and actively cooperate with international organizations and forums.

Key results in 2019:

- An international legal framework was developed to promote cooperation in the peaceful use of nuclear energy in Africa. Intergovernmental and interdepartmental agreements were signed with the Republic of the Congo, the Republic of Rwanda, the Republic of Uganda and the Federal Democratic Republic of Ethiopia. Practical work was initiated with Rwanda on a Nuclear Research and Technology Centre and with the Republic of Cuba on a multipurpose centre for irradiation of agricultural produce.
- Practical implementation of joint projects on the peaceful use of nuclear energy with the Republic of Serbia gained impetus following the signing of a package of documents, including an intergovernmental agreement on the construction of a Russian-design Centre for Nuclear Science, Technology and Innovation in Serbia.
- An agreement was signed with the IAEA on further implementation of a joint initiative to develop nuclear energy infrastructure in countries that are starting to develop the nuclear power industry from 2020 through 2023.

3.2.1. STRENGTHENING THE INTERNATIONAL LEGAL FRAMEWORK FOR COOPERATION

In 2019, the Company continued to work to expand the international legal framework for cooperation in order to promote Russian nuclear energy technologies and enable the Russian nuclear industry to consolidate its position on global markets.

7 intergovernmental agreements (IGAs) and 23 major interdepartmental arrangements were signed (8 and 20 in 2018, 11 and 16 in 2017 respectively)²⁴.

²⁴ Including the agreements signed by ROSATOM.

Cooperation with key partners in strengthening the international legal framework

Congo Rwanda Uganda Ethiopia	<p>As 2019 marked the Year of Africa, the principal focus was on the African region:</p> <ul style="list-style-type: none"> ■ Framework IGAs were signed with Congo, Uganda and Ethiopia, providing a framework for nuclear cooperation with these countries; ■ An IGA on the construction of a Nuclear Research and Technology Centre was signed with Rwanda; in addition, memoranda were signed on personnel training and on shaping a positive public opinion on nuclear power; ■ Road maps were signed with Congo, Rwanda and Ethiopia. <p>These documents stipulate key milestones and areas of further bilateral cooperation on nuclear projects.</p>
Serbia	<p>A comprehensive framework was created for joint practical projects on the peaceful use of nuclear energy:</p> <ul style="list-style-type: none"> ■ A framework IGA was signed, providing a legal framework for nuclear cooperation; ■ A joint statement on strategic partnership was issued, outlining plans for the construction of a Centre for Nuclear Science, Technology and Innovation in Serbia; the relevant IGA was concluded, and a Road Map was signed, which stipulates the key stages of the project preceding the signing of the general contract. <p>The Centre is expected to become the largest facility of this kind in Europe; it will be used for a wide range of fundamental and applied research projects;</p> <ul style="list-style-type: none"> ■ Memoranda were signed on shaping a positive public opinion on nuclear power and on cooperation in personnel training in the peaceful use of nuclear energy based on proven and innovative technologies.
Sweden	<p>An IGA on amendments to the IGA on early notification of nuclear accidents and exchange of information on nuclear facilities dated January 13, 1988 was signed through an exchange of notes. The new IGA details the scope of information to be provided by each party.</p>
Vietnam	<p>An interdepartmental memorandum was signed on the schedule of the project to build a Nuclear Research and Technology Centre; the document stipulates prioritized activities and their timing.</p>
Dominican Republic Cuba Laos Slovakia	<p>The following interdepartmental agreements were signed:</p> <ul style="list-style-type: none"> ■ Framework memoranda of cooperation in the peaceful use of nuclear energy with Slovakia and the Dominican Republic; ■ Memoranda of cooperation in personnel education and training for the nuclear power industry with Cuba and Laos; ■ A memorandum on shaping a positive public opinion on nuclear power with Laos. <p>The signing of these documents will make it possible to initiate the development of nuclear power infrastructure in these countries and to expand the scope of cooperation with Slovakia.</p>
Bolivia	<p>A memorandum of cooperation in the development of the lithium industry was signed. The aim of the document is to examine opportunities for joint exploration and development of lithium deposits, exchange of information and scientific research on lithium mining and the manufacture of lithium products.</p>
China	<p>An agreement was signed on administrative arrangements regarding the procedure for granting Chinese specialists access to the premises of Russian organizations performing work under the IGA on cooperation in the construction and operation of a demonstration fast neutron reactor (CFR-600) in China dated June 8, 2018.</p>

Japan	An Executive Agreement on Cooperation in the Construction of a Regional Centre for Radioactive Waste Conditioning and Long-Term Storage in the Primorsky Territory was signed. Under the Agreement, the Government of Japan will provide financing for the purchase of RAW management equipment necessary for the construction of the Regional Centre. The aim of the Agreement is to enable solid radioactive waste processing in the Far East without additional budget allocations.
US	An Administrative Arrangement was signed with the US Department of Energy under the framework IGA on cooperation in the peaceful use of nuclear energy. The document establishes the procedure for accounting for and tracking nuclear materials with the US obligation codes supplied to Russian nuclear enterprises for processing and subsequent handover under contracts with third-party countries, including to US customers.

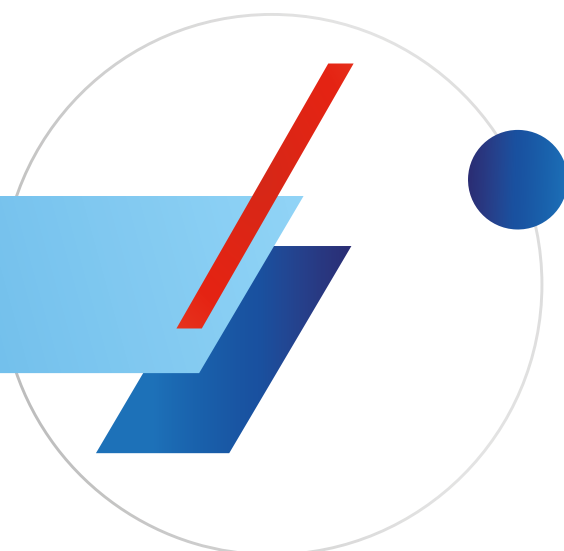
3.2.2. PLANS FOR 2020 AND FOR THE MEDIUM TERM

JSC Atomenergoprom will continue to expand the international legal framework for cooperation for the benefit of nuclear organizations and enterprises, with a focus on non-energy applications of nuclear technologies to promote the achievement of the UN Sustainable Development Goals.

The Company will expand cooperation in personnel training for international organizations, with the Human Resources Department of the ITER Organization to be engaged in the initiative along with the IAEA and the OECD NEA.

The Company plans to intensify cooperation in making nuclear power more acceptable for society and fostering public demand for it.

To achieve its objectives, the Company will continue bilateral cooperation and work with specialized international organizations and institutions, as extensive international cooperation is a necessary prerequisite for the long-term, sustainable and safe development of nuclear power.



3.3. INTERNATIONAL BUSINESS

Key results in 2019:

- The overseas NPP construction project portfolio included 36 power units in 12 countries around the world*.
- Contracts were signed for the supply of nuclear fuel to NPPs in China, Slovakia and Bulgaria.
- Projects were underway in more than 50 countries worldwide.

**Including the project portfolio of ROSATOM.*



3.3.1. PROMOTING JSC ATOMENERGOPROM'S TECHNOLOGIES ON FOREIGN MARKETS

In 2019, the Company worked to increase its share on international markets for nuclear energy technologies amid growing competition in the sphere of NPP construction and supply of nuclear fuel cycle products and services.

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 JSC Atomenergoprom to remain the only company in the world capable of establishing a comprehensive technological partnership in the nuclear power industry.

The Company 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).

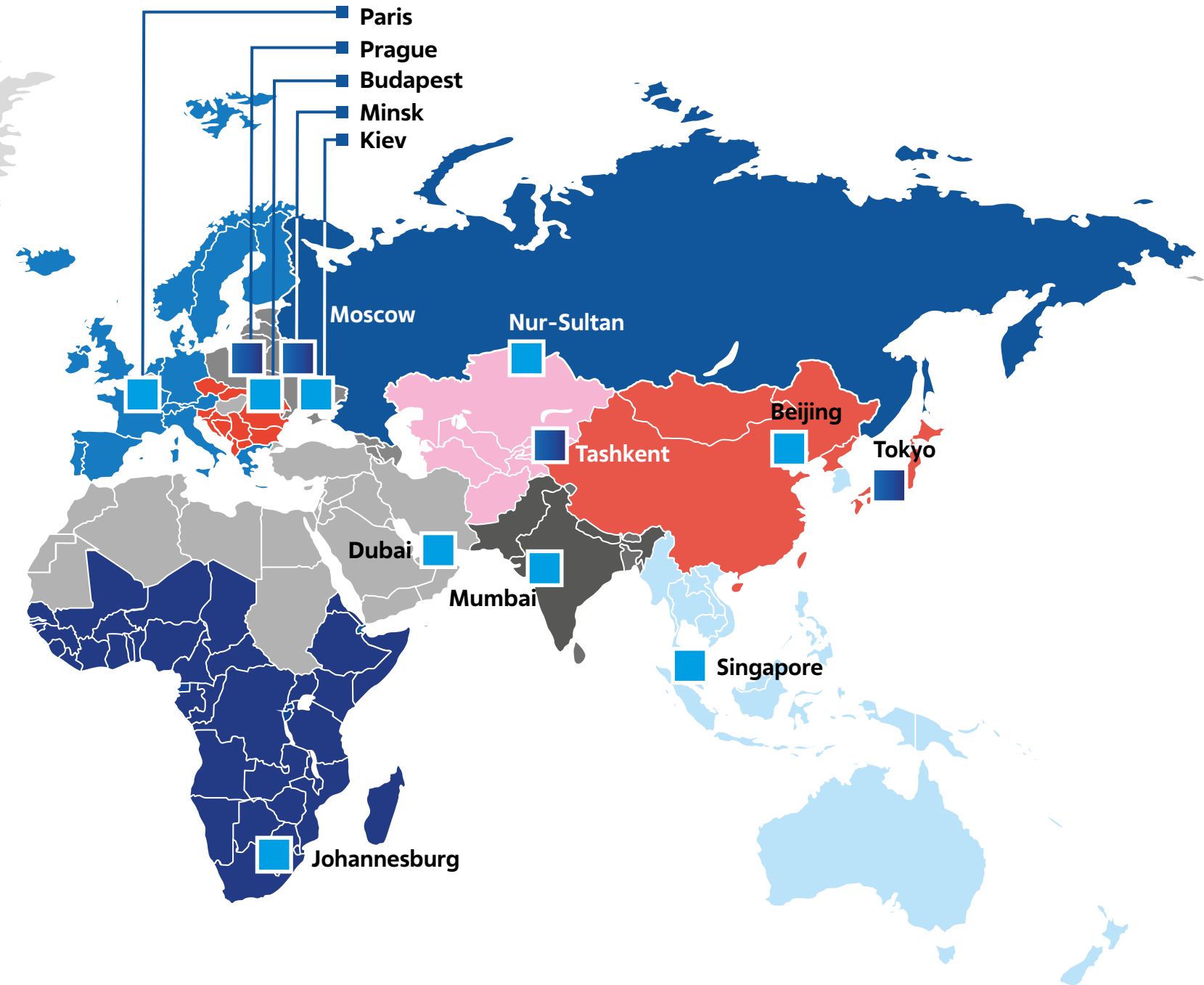
As at December 31, 2019, the foreign regional network²⁵ established in order to increase international sales and promote the Company's products comprised 14 regional centres and country offices in 65 countries around the world (including offices opened in the reporting year in Uzbekistan and Belarus).

²⁵ <http://www.rosatominternational.com/en/>.

COUNTRY AND REGIONAL CENTRES

See also the section 'Stakeholder Engagement'.

- Country offices
- Regional centres
- North America
- Latin America
- Eastern Europe
- Central Europe
- Western Europe
- Russian Federation
- Middle East and North Africa
- Central and South Africa
- Central Asia
- East Asia
- South Asia
- Southeast Asia



Global challenges and risks facing JSC Atomenergoprom as it is entering international markets include the global economic slowdown, a trend towards protectionism, geopolitical factors

3.3.2. NPP CONSTRUCTION ABROAD

As at December 31, 2019, ROSATOM had official commitments to build 36 nuclear power units abroad. 25 power units in 9 countries worldwide are currently at the implementation stage. Russian-design nuclear reactors that are currently under construction fully meet international safety requirements.

In 2019, the Company signed a contract for engineering surveys on the NPP construction site in Uzbekistan to prepare engineering designs of the NPP (a contract for the construction of an NPP with two power units is being negotiated).

The Company continued to participate in tendering for NPP construction in Saudi Arabia.

3.3.3. 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.

Major international projects covering Russian-design NPPs that are currently in operation abroad have a wide geographical scope, ranging from a large-scale project to extend the life of the Armenian NPP and provision of maintenance services in Central and Eastern Europe (Bulgaria, Hungary, Slovakia, Czech Republic) to regular supply of spare parts and equipment and NPP servicing in China and India.

3.3.4 URANIUM MINING ABROAD

In 2019, uranium mining enterprises of Uranium One implemented the annual production programme in full. They produced 4,600 tonnes of uranium, up by 5% year on year.

influencing decision-making by potential customers for the Company's products and services, and a growing market for new materials and new production solutions.

The Company submitted an offer as part of the procedure for selecting a strategic investor for the Belene NPP project. Following its review, JSC Atomenergoprom moved to the next stage of the tendering procedure. The Bulgarian party is expected to make the relevant decision in 2020.

A technical and commercial proposal was submitted as part of a marketing procedure in Kazakhstan.

The Company continued to work towards an agreement on the construction of six new Russian-design power units at a new site in India.

In 2019, as part of the project to extend the life of power unit No. 2 of the Armenian NPP, the Company completed the replacement of main turbine hall equipment at the power unit, which enabled a 15% increase in the NPP capacity.

Under a comprehensive service contract, the Company started to provide support for the commissioning of Akkuyu NPP and personnel training.

Overall, about 1,000 foreign specialists underwent training in 2019 as part of long-term and short-term training programmes for the personnel of foreign NPPs.

URANIUM MINING BY URANIUM ONE ENTERPRISES, tonnes

	2017	2018	2019
Kazakhstan	5,063	4,375	4,617
US	39	10	0
Total	5,102	4,385	4,617

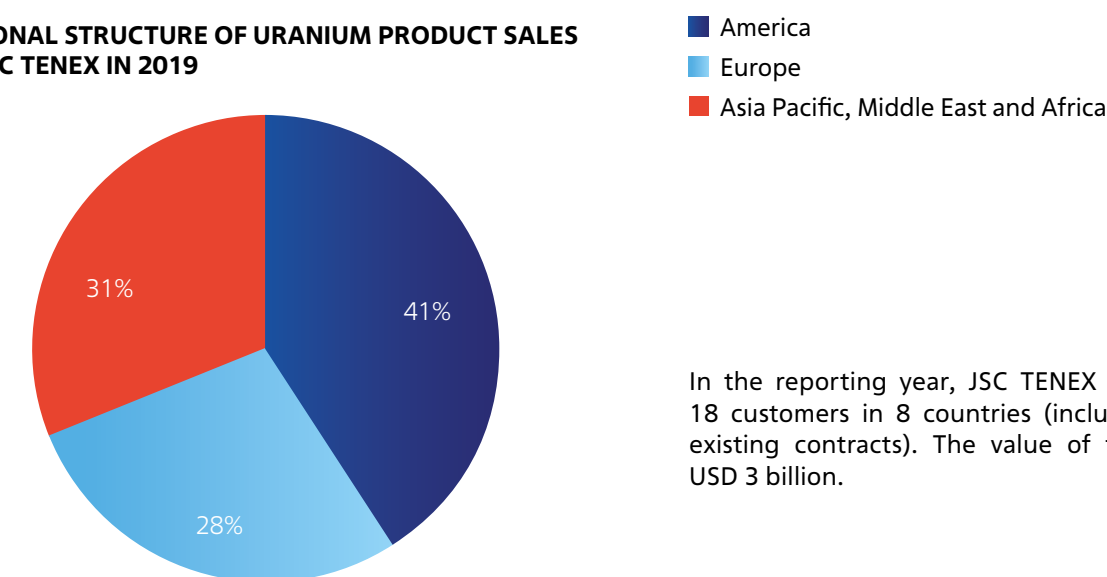
In the reporting year, the mineral resource base of Uranium One enterprises under international reporting standards totalled 192,000 tonnes (197,100 tonnes in 2018).

3.3.5. EXPORT OF URANIUM PRODUCTS AND NATURAL URANIUM ENRICHMENT SERVICES

JSC TENEX is the Company's main organization promoting uranium conversion and enrichment services on the global market and supplying uranium products for power and research reactors. In 2019, JSC TENEX remained one of the leading suppliers of nuclear fuel cycle front-end products as it satisfied a significant share of the demand of Western-design reactors for uranium enrichment services.

All obligations under existing contracts in the reporting year were fulfilled by JSC TENEX on time and in full, with uranium products supplied to 42 customers in 16 countries worldwide. The annual sales volume totalled about USD 2 billion.

REGIONAL STRUCTURE OF URANIUM PRODUCT SALES OF JSC TENEX IN 2019



In the reporting year, JSC TENEX concluded 28 deals with 18 customers in 8 countries (including side agreements to existing contracts). The value of the deals totalled about USD 3 billion.

3.3.6. NUCLEAR FUEL EXPORT

The foreign revenue of JSC TVEL, JSC Atomenergoprom's organization which exports nuclear fuel, totalled USD 0.9 billion in 2019. The 10-year portfolio of overseas orders reached USD 13.9 billion.

In the reporting year:

- A contract was signed for fuel supply for power units No. 7 and 8 of Tianwan NPP (China);
- A contract was signed for fuel supply for power units of Xudabao NPP (China);
- Contract documents were signed for fuel supply for NPPs in Slovakia (until 2030) and Kozloduy NPP in Bulgaria (until 2025).

3.3.7. NEW PRODUCTS FOR INTERNATIONAL MARKETS

CONSTRUCTION OF NUCLEAR RESEARCH AND TECHNOLOGY CENTRES (NRTCS)

As part of the NRTC construction project in Zambia, in 2019, work was completed under contracts for the preparatory period.

Construction of an NRTC was underway in Bolivia. The first and second stages of the Centre were nearing completion, as main equipment for a cyclotron radiopharmacy preclinical complex and a multipurpose irradiation centre was delivered to the construction site.

As part of its efforts to develop integrated sales on international markets, the Company held workshops on its product offers for NRTC and NPP construction in Uganda, Congo, Ethiopia, Brazil, Azerbaijan, Kazakhstan, Rwanda and Argentina.

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 reuse of regenerated nuclear materials in the nuclear fuel cycle 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 2019, a National Strategy for SNF Management based on conceptual solutions forming part of the Balanced Nuclear Fuel Cycle was developed and approved in Belarus with active support from JSC TENEX.

A project to build a container-based dry storage facility for SNF was underway at El Dabaa NPP in Egypt.

In 2019, agreements were signed on projects to build multipurpose irradiation centres in Uzbekistan and Cuba.



A consortium of Russian nuclear organizations headed by JSC TENEX continued to take an active part in the Fukushima disaster clean-up in Japan; it performed molten nuclear fuel (corium) characterization and took measures to ensure safety during its removal. In 2019, after completing research on forecasting changes in corium properties during its ageing, JSC TENEX was appointed as contractor under the second project in this field.

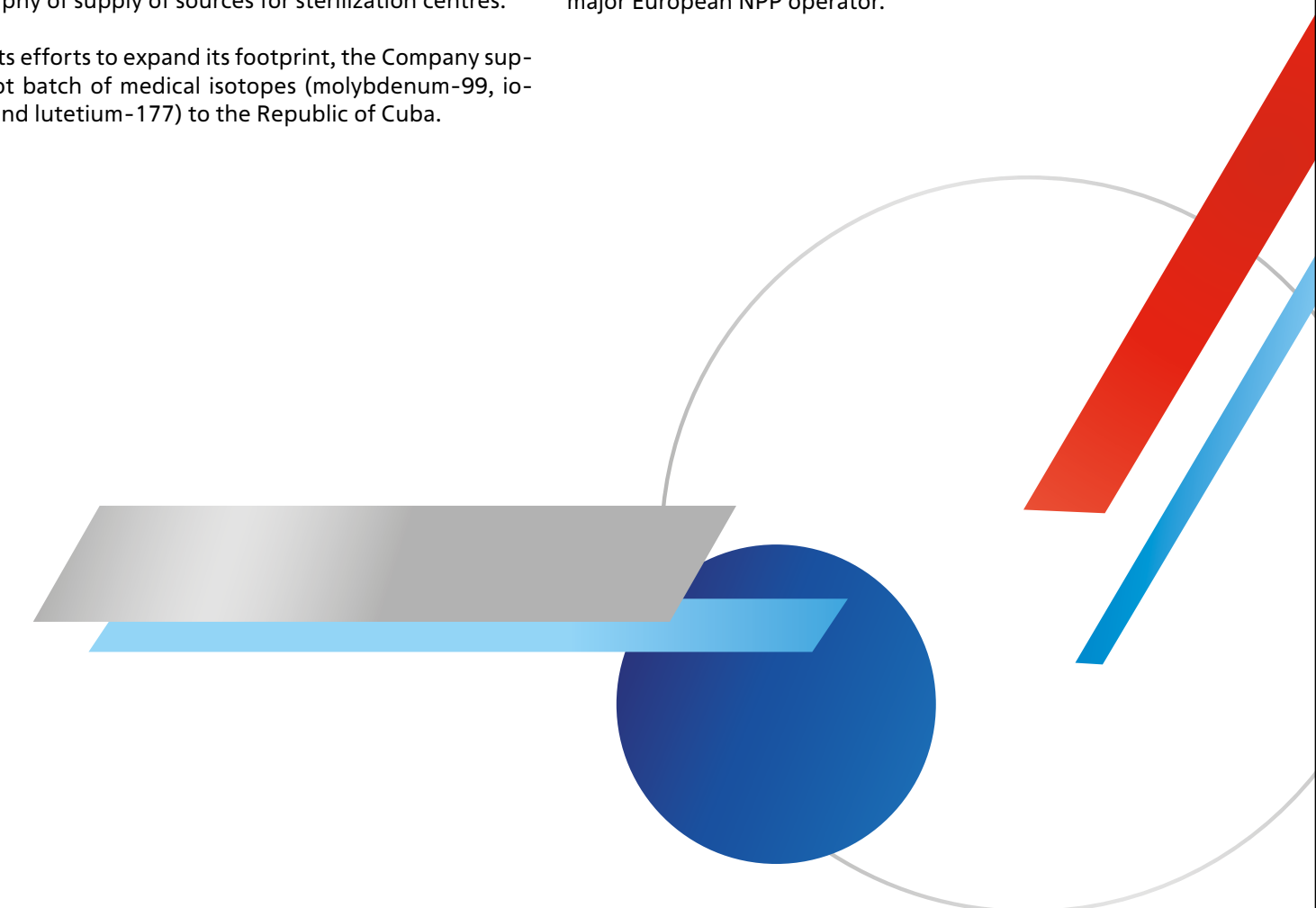
SUPPLY OF ISOTOPE PRODUCTS

In the reporting year, the Company obtained a licence from the French Nuclear Safety Authority for importing Russian-made sources of cobalt-60 into France, which enabled it to expand the geography of supply of sources for sterilization centres.

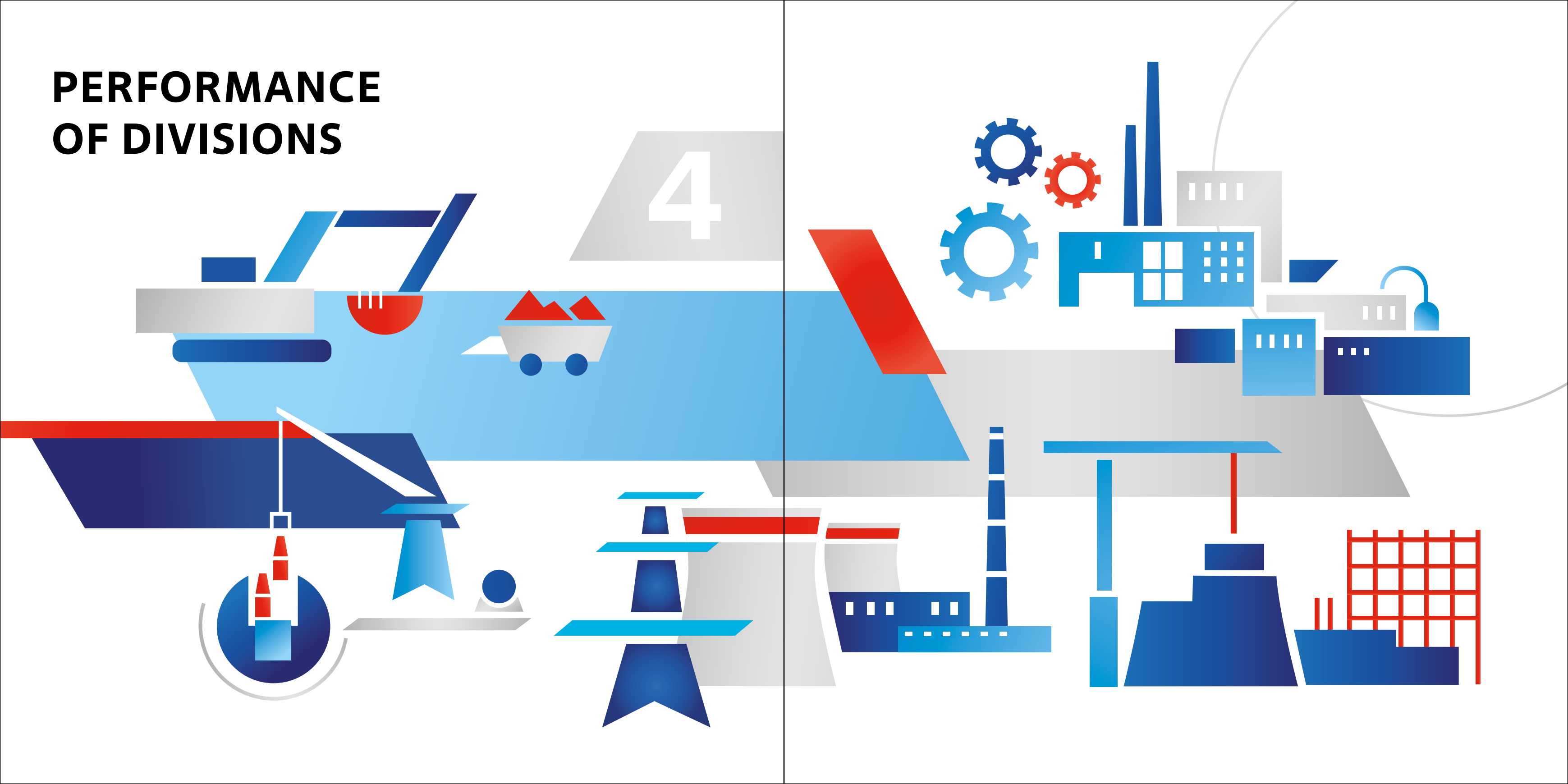
As part of its efforts to expand its footprint, the Company supplied a pilot batch of medical isotopes (molybdenum-99, iodine-131 and lutetium-177) to the Republic of Cuba.

In the reporting year, the Company (as part of a consortium) signed a contract for the dismantling of reactor vessels at Oskarshamn NPP and Barsebäck NPP in Sweden.

Lithium-7 hydroxide monohydrate was successfully registered with the European Chemicals Agency, and the first batches of this chemical were supplied under a long-term contract with a major European NPP operator.



PERFORMANCE OF DIVISIONS



4.1. MINING DIVISION

Key results in 2019:

- Uranium resources totalled 512,700 tonnes.
- 2,911 tonnes of uranium were produced (the production programme was 105% completed).
- Uranium production at JSC Khiagda reached design capacity.

The Mining Division (its holding company is JSC Atomred-metzoloto) consolidates Russian uranium mining assets in the Zabaykalsky Territory (PJSC PIMCU), the Republic of Buryatia (JSC Khiagda), the Kurgan Region (JSC Dalur) and the Sakha Republic (Yakutia) (JSC Elkon MMP)²⁶.

The Division has unique uranium mining capabilities and performs a full range of operations, from geological exploration, design and pilot operation to the decommissioning of production facilities and land rehabilitation. 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.

The Division is implementing a number of non-uranium projects, including the construction of a lead and zinc concentrate plant in the Novaya Zemlya Archipelago, scandium mining (as a by-product), geological exploration and pilot production of gold at the Severnoye deposit, pyrite cinder processing, etc.

4.1.1. OPERATING RESULTS

MINERAL RESOURCE BASE AND URANIUM PRODUCTION

	2017	2018	2019
Mineral resource base, kt	523.9	520.7	512.7
Uranium production, tonnes, including:	2,917	2,904	2,911
PJSC PIMCU	1,631	1,456	1,300
JSC Dalur	592	590	595
JSC Khiagda	694	858	1,016

²⁶ Uranium is mined abroad by Uranium One (see the section 'International Business').

The Division produced 2,911 tonnes of uranium, which totals 105% of the target volume.

Construction of Mine No. 6 continued at PJSC PIMCU. Principal work on infrastructure facilities was completed, and the construction of a headframe was started. In 2020, the Division will start capital development, i.e. the construction of the mine itself.

One of the highlights of 2019 was the fact that production at JSC Khiagda reached the design capacity of 1,000 tonnes, which is almost 19% more than in 2018. JSC Khiagda has become Russia's first digitized uranium mining enterprise. It has created a smart production management system covering the entire production cycle and has started commercial operation of a 'smart mine'. In cooperation with a partner (PJSC Rostelecom), the Division has built fibre optic links with a total length exceeding 200 kilometres and has created

4.1.2. NEW PRODUCTS

In 2019, commercial production was started under the Scandium project, with 230 kilograms of the rare metal produced and shipped to customers.

An industrial partnership agreement was concluded with Aramine (France) on the localization of mining equipment production at PJSC PIMCU under a Russian trademark, Argo. The start of mass production of battery-powered load-haul-dump machines for mining operations is scheduled for 2020.

The Division was developing engineering, drilling and maintenance services: in the reporting year, it concluded contracts with foreign companies in China, Australia and Namibia.

the relevant IT landscape, providing towns and villages in the Bauntovsky District of Buryatia with Internet connectivity.

In the reporting year, JSC Dalur started geological exploration of the Dobrovolnoye deposit. Pilot operation of a modular sulphuric acid regeneration plant with a throughput of 5,000 tonnes per year (which can be increased to 10,000 tonnes per year) started at the Khokhlovskoye deposit.

In 2019, as part of the Vision Zero campaign joined by the Russian nuclear industry (for details, see the section 'Occupational Safety and Health'), the Division became one of the first in Russia to implement the Smart Hard Hats project. This is a personnel positioning system that enables remote monitoring of compliance with safety rules, the movement and health status of employees and thus helps to improve workplace safety.

As part of the Pavlovskoye project in the Novaya Zemlya Archipelago, in the reporting year, the Division finalized design documentation and obtained a positive opinion on engineering surveys at the deposit.

A project to start gold production was launched at the Severnoye deposit in Yakutia. See also the section 'Business Diversification'.

4.1.3. SOCIAL PROJECTS

In 2019, the competition of charity and social projects organized by the Mining Division was ranked in the top three in the Best Corporate Social Investment Programme in the Regions of Operation Aligned with the Business Strategy in the Context of Sustainable Development category in the Corporate Philanthropy Leaders in the Sustainable Development Paradigm rankings compiled by the Donors' Forum, an international consultancy PwC and the Vedomosti newspaper.

In the reporting year, the annual competition of charity and social projects was held for the sixth time in Krasnokamensk (Zabaykalsky Territory). The aim of the competition is to support social entrepreneurship and foster self-employment. Following the competition, 28 important social projects received financial support totalling RUB 2.5 million. In addition, the Division held the Social Entrepreneur's Day, which included:

- A crash programme titled Regional Social Development Accelerator;
- A forum titled From Social Initiatives to Social Entrepreneurship;
- A Path to the Future career guidance project for teenagers.

4.1.4. PLANS AND DEVELOPMENT PROSPECTS

The Mining Division is the centre of responsibility for supplying the nuclear industry and the Russian Federation with uranium and other strategically important metals used in cutting-edge areas of economic development, such as additive manufacturing, robotics, energy storage systems, high-temperature and renewable energy, etc.

One of the Division's priorities is to develop projects in the mining and related industries that are focused on producing strategically important metals. This includes the following initiatives:

- Expanding the range of metals produced by the Division (rare and rare-earth metals and their compounds);
- Improving the processing depth of raw materials produced by the Division (production of metals, alloys and other high-technology products);
- Providing engineering, drilling and maintenance services.

4.2. FUEL DIVISION

Key results in 2019:

- The Division fulfilled all commitments related to the supply of nuclear fuel to Russian and foreign customers.
- Industrial production of MOX fuel for fast neutron reactors was started.
- The Division was assigned the functions of an integrator for a new business area in the sphere of decommissioning of facilities posing nuclear and radiation hazards.

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 Division 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 in the metals, chemical and mechanical engineering sectors, in the sphere of additive manufacturing and energy storage.

The Division comprises enterprises in ten regions of Russia.

4.2.1. OPERATING RESULTS

In 2019, significant progress was made on the project to produce mixed oxide (MOX) fuel consisting of a blend of uranium and plutonium. Industrial production of MOX fuel for fast neutron reactors was launched for the first time in Russia. The first batch of this fuel was loaded into the core of the BN-800 reactor at Beloyarsk NPP. A performance level was reached signalling the possibility of initiating a phased transition of the BN-800 reactor to operating with its core fully loaded with MOX fuel.

The first phase of reactor testing of Russian accident tolerant nuclear fuel resistant to beyond-design-basis accidents was completed. The first experimental fuel assemblies for the VVER-1000 reactor were produced and underwent acceptance inspection.

A unit for separating zirconium chloride and hafnium chloride was put into operation, and a technology for fractional distillation of zirconium tetrachloride was introduced. This project

In 2019, specialists from the Fuel Division received a science and technology award from the Russian Government for developing and starting mass production and commercial operation of radically new generation 9+ gas centrifuges for uranium isotope separation.

will enable the Company to start producing zirconium sponges, which some foreign NPP operators require to be used in nuclear fuel fabrication.

In the reporting year, the relocation of production capacities of JSC Vladimir Tochmash Production Association to the site of PJSC Kovrov Mechanical Plant in Kovrov (Vladimir Region) was completed.

4.2.2. NEW PRODUCTS

In the reporting year, an agreement was signed with Hermith GmbH (a major European titanium supplier) on establishing a joint venture to manufacture titanium alloy products. The joint venture will specialize in high value-added products for knowledge-intensive sectors, such as the aerospace, automotive and medical industry. Plans for the initial stage include starting the production of titanium wire for additive manufacturing (3D printing) and seamless pipes for aircraft hydraulic systems. As the business will be developing, its product range might be expanded to include such products as aircraft fasteners, titanium springs for the automotive industry, workpieces for the production of prosthetic implants, superconductors, etc.

PJSC NCCP, an organization forming part of the Division, successfully completed a qualification procedure as a supplier of battery materials and concluded contracts for the supply of battery-grade lithium metal with leading global producers of primary lithium batteries.

4.2.3. SOCIAL PROJECTS

In 2019, the Division organized a competition of important social projects. More than 90 applications were submitted by non-governmental organizations in the Division's regions of operation in the sphere of sports, culture and arts, support for the disabled and fostering patriotic, ethical and spiritual values. 24 projects worth a total of about RUB 23 million were supported and implemented.

In 2019, a cooperation agreement was signed with the Agency for Strategic Initiatives to implement a programme titled 'Future Talent for the Region' in Glazov and the CATFs of Zelenogorsk, Novouralsk and Seversk. The aim of the project is to form

4.2.4. PLANS AND DEVELOPMENT PROSPECTS

- To participate in competitive tendering for nuclear fuel supply for European NPPs;
- To sign contracts for the supply of nuclear fuel and its components for Western-design research reactors;
- To produce MOX fuel assemblies for the first full reloading of the BN-800 reactor and to start the transition of the BN-800 reactor to fully operating on MOX fuel;

In 2019, the Fuel Division started pilot operation of the first Russian-made multi-powder 3D printer with two laser sources. Mass production of 3D printers was started, with the first two sets supplied to ROSATOM's Additive Manufacturing Centre.

The Division completed a contract for the supply of strands for a prototype superconducting dipole magnet for upgrading the Super Proton Synchrotron (SPS) at the European Organization for Nuclear Research (CERN) in Switzerland.

In 2019, the Division was appointed as integrator for a new business area in the sphere of decommissioning of facilities posing nuclear and radiation hazards. The relevant competence centres were formed in the Division's enterprises. See also the section 'Business Diversification'.

and develop leader teams comprising proactive, ambitious and passionate school students who are able and willing to participate in designing and implementing social and economic projects crucial for their home region. Following the completion of the programme, authors of the best projects were awarded trips to the Artek International Children's Centre (with five people selected from each town).

An IT Cube was opened in Elektrostal with support from JSC TVEL. This is the first digital education centre of this kind for children and teenagers in the Fuel Division's home towns.

- To develop the production of additive manufacturing equipment at LLC RME Centrotech and JSC UEIP (organizations forming part of the Division);
- To conclude new contracts with third-party customers for the supply of energy storage systems for logistical electric vehicles;
- To expand lithium metal production capacities.

4.3. MECHANICAL ENGINEERING DIVISION

Key results in 2019:

- Mechanical engineering products were delivered on time to seven NPPs in Russia and abroad.
- A contract was signed for the package supply of RITM-200 reactor units for the fourth and fifth project 22220 icebreakers.
- Pumps were produced and delivered for the fourth line of the Yamal LNG project.

The Mechanical Engineering Division (its holding company is JSC Atomenergomash) is one of Russia's largest groups of mechanical engineering enterprises offering a full range of solutions for the design, manufacture and supply of equipment for the nuclear and thermal power industry, the gas and petrochemical industry, shipbuilding and the special steel market.

The Division controls the entire production chain of key equipment for the nuclear island and the turbine hall, from R&D and the release of detailed engineering designs to process engineering and manufacture of equipment. The Division comprises major power machine engineering enterprises, including manufacturing, research and engineering organizations in Russia, Europe and the CIS.

4.3.1. OPERATING RESULTS

In the reporting year, mechanical engineering products were delivered on time to seven NPPs, including three NPPs in Russia (Kursk NPP-2, Leningrad NPP-2 and Kola NPP) and four NPPs abroad (Akkuyu NPP, Kudankulam NPP, Rooppur NPP and the Belarusian NPP).

The Division completed the manufacture of a reactor unit and heat exchange equipment for the turbine hall of power unit No. 4 of Kudankulam NPP (India).

In 2019, a contract was signed for the package supply of RITM-200 reactor units for the fourth and fifth project 22220 icebreakers. A cooperation agreement was signed as part of the work on the Lider icebreaker.

4.3.2. NEW PRODUCTS

As part of its gas and petrochemical equipment business, in 2019, the Division continued to work on import substitution projects covering a wide range of critical equipment for the Russian oil and gas industry. Pumps were produced and delivered for the fourth line of the Yamal LNG project. Russian-designed and Russian-made equipment will be used for the first time at an operating medium-scale LNG plant.

As part of the thermal power equipment business, the Division concluded a contract for the package supply of electro-mechanical and process systems and the provision of services for the construction of four waste incineration plants in the Moscow Region. In addition, a contract was signed for the

replacement of steam superheaters for steam boilers at a thermal waste treatment plant in the UK.

As part of the shipbuilding business, agreements were concluded with foreign manufacturers on the localization of production of marine equipment.

An important achievement on the special steel market was the fact that in the reporting year, the Division underwent product certification as a supplier of parts for long-lead rotor blanks for NPP construction projects being implemented by ROSA-TOM and JSC Atomenergoprom abroad. *See also the section 'Business Diversification'.*

4.3.3. SOCIAL PROJECTS

In 2019, six enterprises of the Division in Moscow, Ekaterinburg, Saint Petersburg, Volgodonsk, Petrozavodsk and Podolsk participated in a charity donation of essential items and food for people in need (residents of retirement homes, care homes for elderly and disabled people, and refugees). Employees of the Division in Volgodonsk conducted a volunteer campaign to mark the International Day of Older Persons: they organized celebrations for elderly people and congratulated them.

A campaign was conducted in Volgodonsk to provide humanitarian aid for children at the Aistenok children's social rehabilitation centre, for low-income families with many children and for disabled children at boarding school No. 2.

The Green Office Change Support Team formed in the Division set up a used battery collection point (the batteries are subsequently sent for recycling), conducted an environmental clean-up, organized waste paper collection and installed a health-food vending machine in the Moscow office of the Division.

4.3.4. PLANS AND DEVELOPMENT PROSPECTS

In 2020, the Division plans to:

- Produce equipment for NPP construction projects being implemented by ROSATOM and JSC Atomenergoprom on schedule;
- Produce equipment for the second waste incineration plant in the Moscow Region and conclude contracts for new waste incineration plant construction projects in Russia;
- Conclude contracts for thermal power plant upgrade projects in Russia;

- Conclude contracts and produce a batch of LNG loading pumps for a large-scale LNG plant.

The Division's long-term priority is to become part of a global production chain by participating in partner projects. To achieve this goal, the Division will leverage its reputation as a reliable partner and a leader on the Russian market and develop its own capabilities, technological solutions and products.

4.4. ENGINEERING DIVISION

Key results in 2019:

- Five NPP power units were under construction in Russia during the year. *(For details on NPP construction abroad, see the section 'International Business'.)*
- All key milestones were completed on the construction sites of Kursk NPP-2 and Leningrad NPP-2.

The Engineering Division (its holding company is JSC ASE EC) has well-developed capabilities for managing the construction of complex engineering facilities.

The main business areas of the Division include the following:

- Design and construction of large NPPs in Russia and abroad;

- Developing digital technologies for managing complex engineering facilities based on the Multi-D platform.

The Division actively engages local and international suppliers in the implementation of its projects. The Division comprises major design institutes in Moscow, Saint Petersburg and Nizhny Novgorod.

4.4.1. OPERATING RESULTS

KURSK NPP-2

All 12 key construction milestones for 2019 were completed, including:

- The start of concreting of the second layer of the internal containment vessel at power unit No. 1;
- Moving the thrust truss at power unit No. 1 into position;
- Installation of the core catcher at power unit No. 1;
- The completion of concreting of the foundation slab of the reactor building at power unit No. 2.

LENINGRAD NPP-2

All six key milestones were completed, including:

- The start of trials and testing of power unit equipment;
- Moving diesel generators into final position;
- Completing the assembly of the reactor in order to carry out hot and cold trial runs.

4.4.2. SOCIAL PROJECTS

The Division held the annual competition of charity projects for non-profit organizations in its regions of operation. The competition included the following categories: The Young Generation; Environment; Culture and Sports; Patriotic Initiatives; The Future Lies with Science. In 2019, financial support for projects totalled RUB 16 million. Considerable emphasis was placed on important social, patriotic, cultural and sporting

initiatives undertaken by local communities in Ostrovets and its vicinity, near the construction site of the Belarusian NPP.

In the reporting year, more than 100 employees of the Division volunteered to take part in a blood typing campaign launched in order to compile a nation-wide bone marrow register.

4.4.3. PLANS AND DEVELOPMENT PROSPECTS

The design and construction of large NPPs remains the main business focus of the Engineering Division; its main priority is to strictly comply with the terms and conditions of all contracts (primarily those related to the duration and cost of construction).

The key objective is to make the Division more competitive on the international market (including in terms of the LCOE).

4.5. POWER ENGINEERING DIVISION

Key results in 2019:

- Electricity output at Russian NPPs totalled 208.8 billion kWh, accounting for 19% of the country's total electricity output.
- Power unit No. 2 of Novovoronezh NPP-2 started commercial operation ahead of schedule.
- The floating nuclear power plant in Pevek (Chukotka Autonomous District) was connected to the power system.
- The capacity of 10 Russian NPPs (36 operating power units) totalled 30.3 GW.
- The NPP capacity factor totalled 80.4%.



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.

Its main business areas include power and heat generation at NPPs and acting as the operator of nuclear facilities (nuclear power plants), radiation sources and facilities storing nuclear materials and radioactive substances in accordance with Russian legislation.

4.5.1. OPERATING RESULTS

In 2019, electricity output at 36 power units of 10 operating NPPs totalled 208.8 billion kWh, reaching a new all-time high in the history of Russian nuclear power generation (in 2018, electricity output totalled 204.3 billion kWh). The balance target set by the Federal Antimonopoly Service of Russia was exceeded by 3%. The NPP capacity factor totalled 80.4% (79.9% in 2018).

The increase in electricity output was driven mainly by the following factors:

The Division includes operating NPPs, directorates of NPPs that are under construction, the Capital Projects Implementation Branch Office, the Directorate for Construction and Operation of Floating Thermal Nuclear Power Plants, the Technology Branch Office, the Pilot and Demonstration Engineering Centre for Decommissioning and the Akkuyu Engineering Centre; they all have the status of the Division's branches.

- NPP power units commissioned in 2018 (power unit No. 4 of Rostov NPP and power unit No. 1 of Leningrad NPP-2) operating at rated capacity;
- Power unit No. 2 of Novovoronezh NPP-2 starting commercial operation ahead of schedule (this is the third state-of-the-art generation 3+ power unit in Russia, meeting the highest safety standards);
- Shorter duration of scheduled maintenance and repairs at power units.

In 2019, the floating nuclear power plant in Pevek (Chukotka Autonomous District) was connected to the isolated power system of the Chaun-Bilibino energy hub and will now provide power supply to the region. The mobile thermal nuclear power

4.5.2. NEW PRODUCTS

In 2019, a 48 MW Data Centre near Kalinin NPP started full-scale operation. This is the largest data centre in Russia and one of the largest data centres in Europe. A joint project was launched in cooperation with IBM to create a cloud service based on open source technology; this will enable project teams, institutes, the scientific community, start-ups and other organizations interested in digital innovations to use the capabilities of the Data Centre. An agreement was signed with PJSC FGC UES on building a hyperscale data centre in Moscow.

The Division is implementing a large-scale project to produce cobalt-60 on an industrial scale. This isotope is used for sterilization in agriculture, healthcare and industry, as well as

4.5.3. SOCIAL PROJECTS

In 2019, the Division implemented the Megawatt of Health project, which is aimed at promoting a healthy lifestyle among its employees: for every kilometre of distance that they covered as part of this sporting project, funds were donated to charity. About 2,500 employees of the Division took part in the campaign; they walked a total of 527,000 kilometres, ran more than 111,000 kilometres, swam 9,000 kilometres and cycled more than 215,000 kilometres. A total of RUB 4 million

4.5.4. PLANS AND DEVELOPMENT PROSPECTS

The balance target for nuclear power generation for 2020 has been set by the Federal Antimonopoly Service of Russia at 207.6 billion kWh.

In addition, in 2020, the Division plans to put the floating thermal nuclear power plant in Chukotka into operation and to start up power unit No. 2 of Leningrad NPP-2.

plant using marine technology will facilitate the development of the Chukotka region, including local manufacturing enterprises and infrastructure.

for material modification. It is produced at seven power units equipped with RBMK reactors at Smolensk, Kursk and Leningrad NPPs. In late 2019, the loading of the first batch of cobalt absorbers was completed at Kursk and Smolensk NPPs. In addition, the Division started to produce medical isotopes (molybdenum-99, iodine-131 and iodine-125) in RBMK reactors.

In 2019, JSC AtomEnergoSbyt (an organization forming part of the Division) continued to operate as the power supplier of last resort in the Kursk, Tver, Smolensk and Murmansk Regions through the branches established in these regions. Electricity sales totalled 15.7 billion kWh.

was raised as part of the campaign; the funds were donated for charity projects to support children in the towns and cities where NPPs are located.

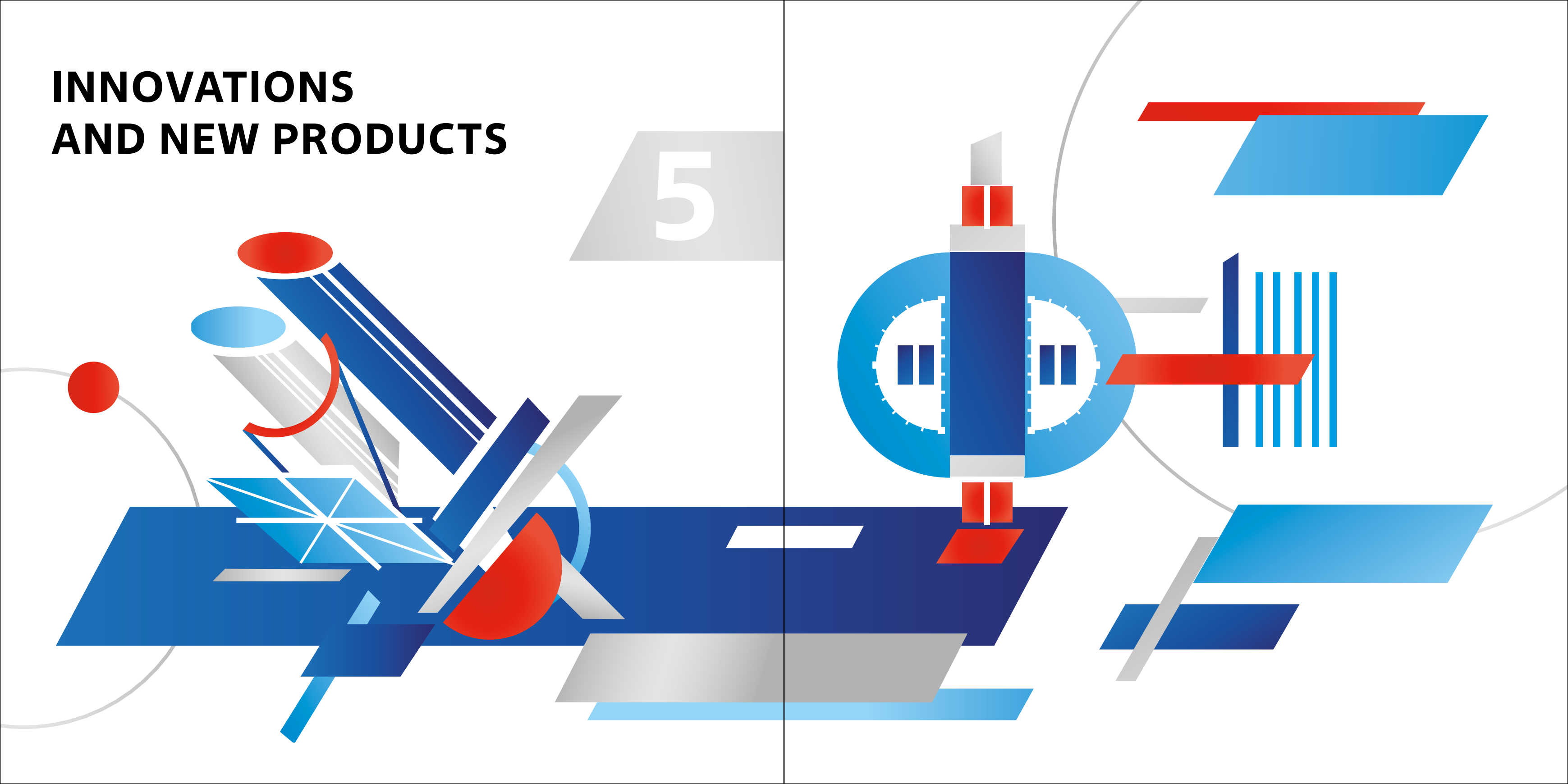
The Division held the annual competition of important social projects for non-profit organizations in its regions of operation. Following the competition, 64 projects worth a total of RUB 60 million were implemented.

The Division's long-term priorities include:

- Ensuring safe and reliable NPP operation and minimizing the negative impact on people's health and the environment;
- Protecting employees' health;
- Increasing nuclear power generation and reducing unit costs;
- Developing the Division's regions of operation;
- Developing promising solutions and competitive products.

INNOVATIONS AND NEW PRODUCTS

5



5.1. RESEARCH AND INNOVATIONS

Key results in 2019:

- Over 50 technological projects were underway.
- The number of international applications filed and patents obtained in the reporting year totalled 439.
- A cooperation agreement was signed with the Russian Academy of Sciences.

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

5.1.1. IMPLEMENTATION OF THE INNOVATIVE DEVELOPMENT AND TECHNOLOGICAL MODERNIZATION PROGRAMME

In 2019, a new version of the Innovative Development and Technological Modernization Programme was prepared. It includes national projects, prioritized projects promoting scientific and technological development in the nuclear industry, and innovative digital transformation projects.

In the reporting year, more than 50 technological projects aimed at creating technologies to transform existing and encourage the emergence of new markets were being implemented as part of the Innovative Development Programme.

Implementation of the Innovative Development and Technological Modernization Programme was focused on the following areas:

- Upgrading existing technologies for energy markets;
- Creating new technologies for energy markets;
- Creating new technologies and upgrading existing technologies for non-energy markets;
- Developing an innovation management system and innovation infrastructure, cooperating with third-party organizations.

In the reporting year, 15 'process' projects were being implemented; they are aimed at streamlining organizational processes in the sphere of research and innovations, including speeding up the development of new products and their introduction in the market.

5.1.2. PRORYV (BREAKTHROUGH) PROJECT AIMED AT CLOSING THE NUCLEAR FUEL CYCLE

A long-term project, Proryv (Breakthrough), aimed at developing fast neutron reactors and closing the nuclear fuel cycle is being implemented in the Russian nuclear industry. 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. The ultimate goal is to create a two-component nuclear power system with a closed fuel cycle, in which power units equipped with thermal-neutron VVER reactors, which are the mainstay of the global nuclear power industry, will be operated alongside power units equipped with fast neutron reactors. As a result, the nuclear industry will shift to a circular economy consistent with sustainable development principles and objectives.

In 2019, out-of-reactor tests of main equipment for the core of the BREST-OD-300 reactor unit were completed. A positive opinion was obtained on innovative solutions for a power unit equipped with the BREST-OD-300 reactor following an expert review by the Russian Academy of Sciences. Preparations were started for the construction of the power unit equipped with the BREST-OD-300 reactor. Tests of innovative mixed nitride uranium-plutonium (MNUP) fuel continued successfully in the BN-600 research reactor and the BOR-60 power reactor.

In 2020, the Company plans to obtain a licence for the construction of the power unit equipped with the BREST-OD-300 reactor and to start the production of long-lead equipment for the BREST-OD-300 reactor.

5.1.3. PLAN OF R&D TOPICS

In 2019, the Company started to implement the Consolidated Plan of R&D Topics. The Plan is aimed at promoting scientific and technological development in the Russian nuclear industry in prioritized 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 2019, 125 projects worth a total of more than RUB 5.5 billion were underway. More than two thirds of the projects progressed to the next technology readiness level (TRL).

5.2. BUSINESS DIVERSIFICATION

Key results in 2019:

- Revenue from new products in the Russian nuclear industry totalled RUB 227.9 billion, making up 19.8% of the total revenue.
- The 10-year portfolio of orders for new products in the Russian nuclear industry reached RUB 1,169.1 billion.

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.

5.2.1. RESULTS IN 2019

In the reporting year, revenue from new products totalled RUB 227.9 billion, which is 1.7% above the target (RUB 224.0 billion) and 15.9% more than in 2018. The 10-year order portfolio reached

The Company has developed an effective system for managing new businesses; it includes integrators and enterprises in the relevant business areas. The responsibility for business development at all levels is reflected in overarching key performance indicators:

- Short-term indicators, such as revenue from new products during the year;
- Long-term indicators, such as the 10-year portfolio of orders for new products.

As at December 31, 2019, the Company's portfolio of new products covered 81 areas, including seven strategic programmes: Wind Power, Composite Materials, Nuclear Medicine, Waste Management, Oil and Gas Services, Digital ROSATOM and the Smart City²⁷.

RUB 1,169.1 billion, which is 8.0% above the target (RUB 1,082.5 billion) and 8.0% more than in 2018.

REVENUE FROM NEW PRODUCTS AND 10-YEAR PORTFOLIO OF ORDERS FOR NEW PRODUCTS, RUB billion

	2017	2018	2019
Revenue from new products	170.9	196.7	227.9
10-year portfolio of orders for new products	814.1	1,082.6	1,169.1

²⁷ See also the section 'Developing the Regions of Operation'.

WIND POWER

JSC Atomenergoprom is actively developing the Russian wind power market. In March 2020, the Adygea Wind Power Plant (WPP) started to supply electricity to the Russian wholesale market. This is the Company's first wind farm, which comprises 60 wind turbines with a total installed capacity of 150 MW.

NUCLEAR MEDICINE

In the reporting year, the Company signed a memorandum of cooperation with the Federal State Budgetary Institution National Medical Research Radiological Centre of the Ministry of Health of Russia. The memorandum sets out plans for expanding cooperation on clinical trials of radioisotope products and medical equipment developed and produced for nuclear medicine and medical radiology.

NEW MATERIALS

In 2019, the Company signed an agreement with the Government of the Russian Federation titled 'Technology for New Materials and Substances'. A draft road map was prepared for developing innovative areas, such as additive manufacturing, polymer composite materials, rare and rear-earth metals, new structural and functional materials, and for stimulating domestic demand.

In 2019, the Russian nuclear industry played an active role in establishing the Composites Without Borders Inter-Regional Industry Cluster, which includes the Republic of Tatarstan and the Saratov and Moscow Regions. It is intended that the Tula and Ulyanovsk Regions will be included in the Cluster in 2020.

MANAGEMENT OF HAZARD CLASS 1 AND 2 WASTE

In 2019, a federal law came into force whereby ROSATOM was authorized to create a comprehensive system for the management of hazard class 1 and 2 waste in Russia. Pursuant to a decree of the Government of the Russian Federation, FSUE Federal Environmental Operator (formerly FSUE RosRAO), an enterprise of ROSATOM, was appointed as federal operator responsible for the management of hazard class 1 and 2 waste.

The Company is implementing a WPP construction programme on four more sites in the Stavropol Territory and the Rostov Region. The next major wind farm will be built in the Kochubeyevsky District of the Stavropol Territory. Its installed capacity will total 210 MW.

In 2019, bench tests of a KLT-6 linear particle accelerator and an upgraded AGAT-VT brachytherapy facility were completed. Upgraded facilities for the production of molybdenum-99, lutetium-177 and iridium-192 for use in nuclear medicine started commercial operation. The first batch of xenon-133 designed for the production of a radiopharmaceutical was manufactured.

The Cluster will facilitate cooperation between the regions in order to launch full-cycle production of composite materials in Russia, including the production of carbon fibre, glass fibre, basalt fibre, fabrics and pre-pregs based on them, and finished composite products for end users, and to create the relevant process chain.

The Company signed an agreement with PJSC RusHydro on cooperation in the field of composite materials. The cooperation includes such areas as composite solutions for main and auxiliary equipment and structural components of small-scale hydropower plants, wind power plants and external reinforcement systems.

In the reporting year, key targets were set for ROSATOM's Strategic Programme titled 'Industrial and Consumer Waste Management'. FSUE Federal Environmental Operator and JSC Rusatom Greenway, an enterprise of JSC Atomenergoprom, became its main participants. FSUE Federal Environmental Operator will focus on the management of hazard class 1 and 2 waste and environmental remediation. JSC Rusatom Greenway is responsible for developing the commercial part of the Strategic Programme.

In 2019, all targets set under the Infrastructure for the Management of Hazard Class 1 and 2 Waste Federal Project were achieved.

The development of a national information system for the management of hazard class 1 and 2 waste was initiated. The system will make it possible to accumulate all information

INDUSTRIAL EQUIPMENT

In 2019, the Company won a tender announced by the Ministry of Industry and Trade of Russia for the construction of a test bench for the testing of equipment for large-scale liquefied natural gas (LNG) plants.

The Company signed an agreement with PJSC ROSSETI on cooperation in energy markets, digitization of the electricity

HYDROGEN ENERGY

In 2019, a memorandum of cooperation was signed with the Ministry of Economy, Trade and Industry of Japan; under the memorandum, a feasibility study will be conducted for developing a supply chain for hydrogen produced by the Company's organizations.

5.2.2. PLANS FOR 2020

In 2020, the Company plans to approve programmes for additive manufacturing and the development of the lithium business. In the future, international logistics and hydrogen energy may also be given the status of strategically important business areas. In addition, in 2020, the Company plans to approve a product strategy in the sphere of nuclear instrumentation engineering.

In 2020, construction and installation work will start at the site of the Nuclear Medicine Centre in Irkutsk.

about the waste management system, monitor waste flows from waste generation sources to waste processing sites, keep records, detect violations, optimize logistics and select the best infrastructure location.

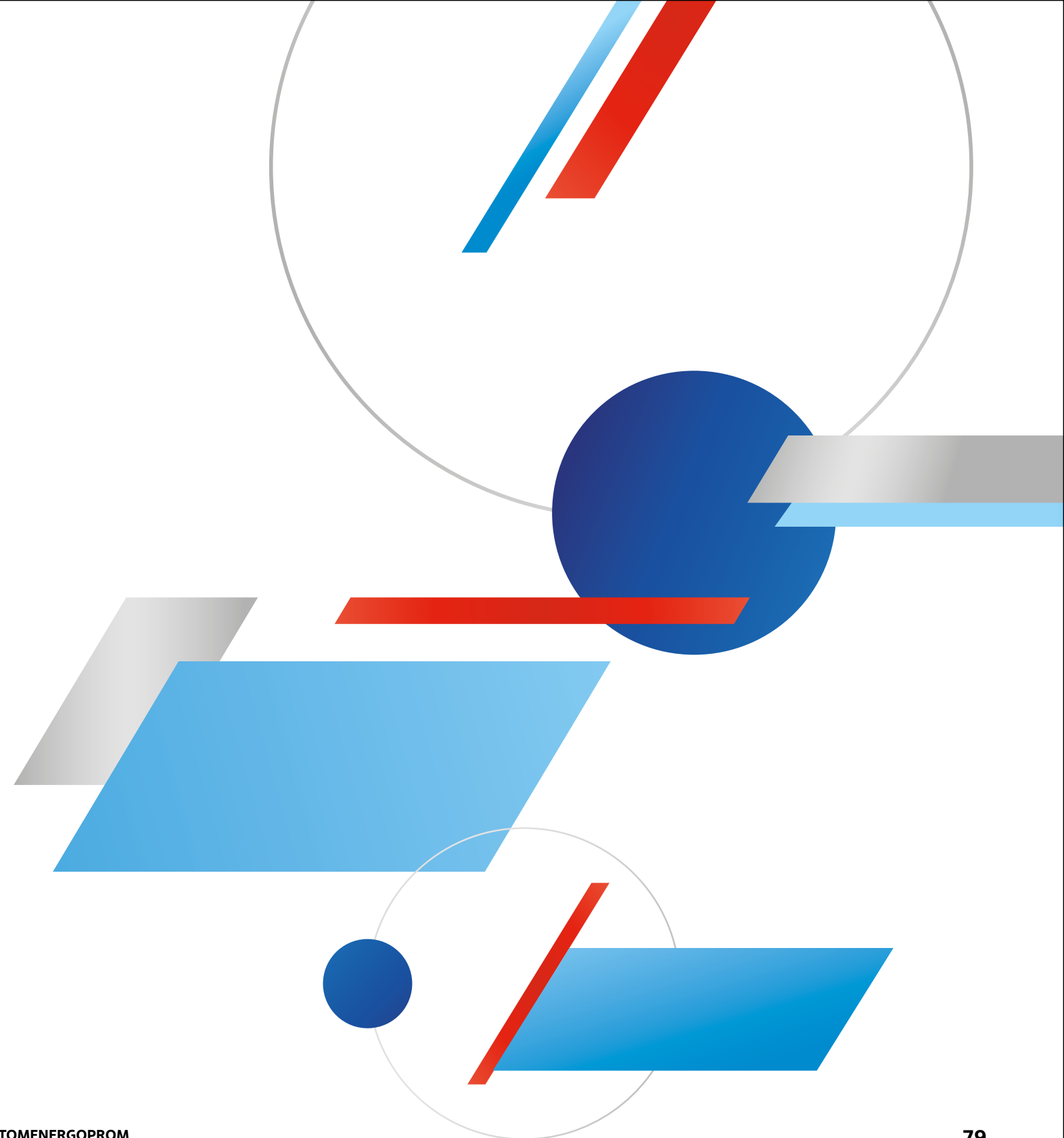
Targets for environmental remediation as part of municipal landfill reclamation in Chelyabinsk were exceeded.

industry and producing substitutes for imported electrical equipment. The cooperation will involve joint design and construction of power grid infrastructure in order to integrate Russian-design power generation facilities into foreign power grids using digital solutions and Russian electrical equipment.

An agreement was concluded with the Government of the Sakhalin Region, JSC Russian Railways and JSC Transmashholding on building and developing a passenger rail system on Sakhalin Island which will use trains powered with hydrogen fuel cells, as well as the relevant support systems.

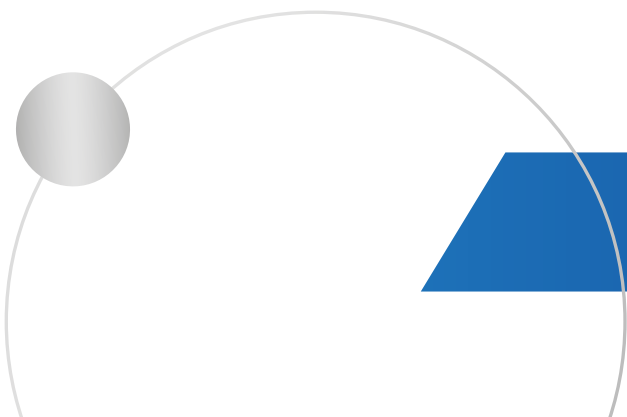
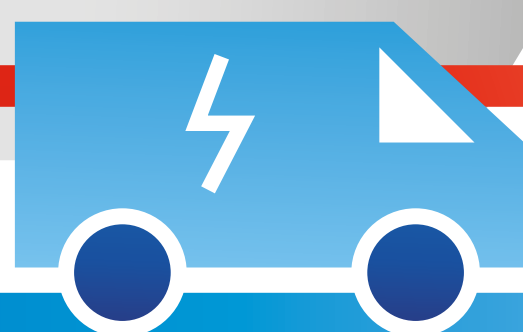
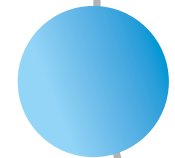
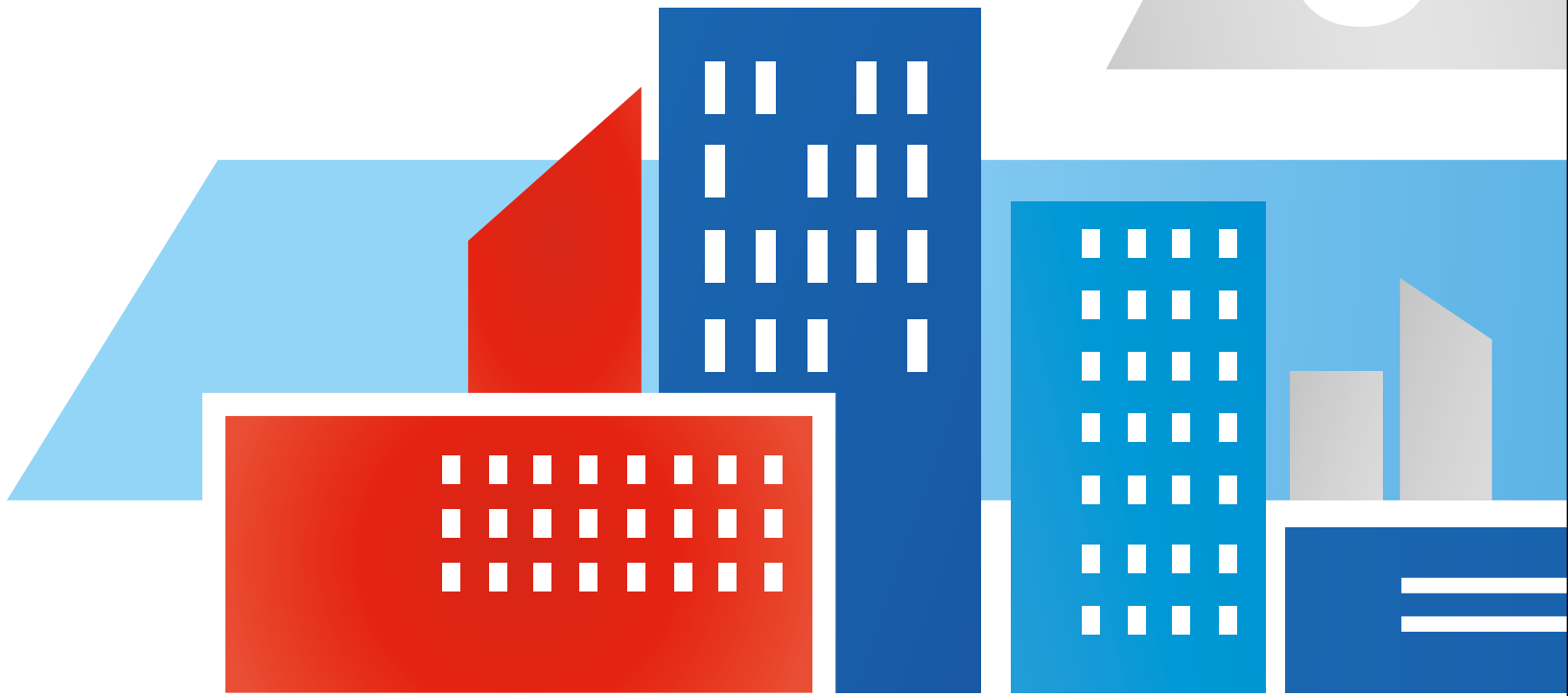
As part of its composite materials business, in 2020, the Company plans to commission a PAN precursor plant. The Company will initiate the establishment of the Polymer Composite Materials Competence Centre as part of implementation of the road map for developing a high-technology area, Technology for New Materials and Substances, in Russia.

As part of its environmental initiatives in the sphere of class 1 and 2 industrial waste management, the Company intends to build an ash and slag processing facility.



DIGITAL TRANSFORMATION

6



Key results in 2019:

- Seven road maps for developing end-to-end digital technologies in Russia were prepared and approved;
- A large-scale project to create a Russian-designed quantum computer was launched;
- Infrastructure was created for digital product development, marketing and support. A number of digital products were launched on the market: Logos Thermo, the Volna programming and computing system, the Technical Documentation E-Shop and the Kalininsky Data Centre.



Digitization of the economy and everyday life is a key modern trend. JSC Atomenergoprom leverages its extensive experience in responding to major technological challenges to

develop efficient innovative solutions that will usher in the digital world of the future.

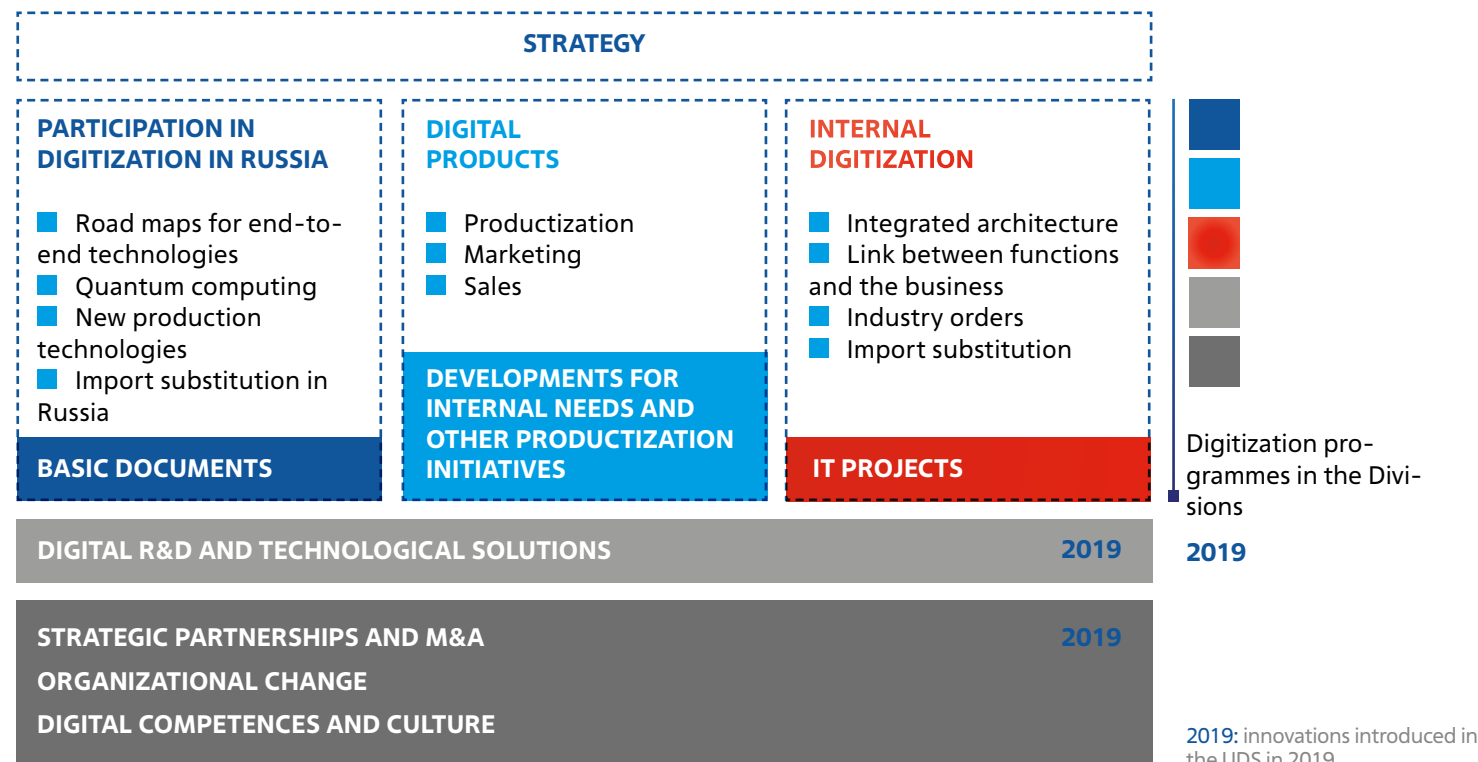
6.1. UNIFORM DIGITAL STRATEGY

ROSATOM and JSC Atomenergoprom are implementing a Uniform Digital Strategy (UDS), which is focused on supporting the digitization of the Russian economy, developing the Company's own digital products and putting them on the market, and improving internal business processes. In 2019, the UDS was updated, taking into account the results achieved during the year and changes in the market.

The UDS covers three key areas:

- 1) Participation in digitization in Russia
- 2) Digital products
- 3) Internal digitization

CONCEPT OF THE UNIFORM DIGITAL STRATEGY



The UDS implementation relies on four main pillars:

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

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

In order to implement the UDS, in 2019, the Company formed the Digitization 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).

6.2. PARTICIPATION IN DIGITIZATION IN RUSSIA

In 2019, ROSATOM became a competence centre under the Digital Technology Federal Project, which forms part of the Digital Economy National Programme. In the reporting year, all targets set under the Federal Project were achieved. 105 projects worth a total of RUB 14 billion were approved; government support totalling RUB 941 million was provided for seven projects involving Russian nuclear organizations.

A project code-named Liman was successfully completed in 2019. The project involved developing technology for creating superconducting two-qubit systems (a prototype quantum computer) and demonstrating single-qubit and two-qubit operations that can create quantum entanglement and, in the future, will make it possible to perform any quantum algorithms.

Seven road maps for developing end-to-end digital technologies in Russia were prepared and approved in 2019. A road map for quantum computing in the Russian nuclear industry successfully underwent stress tests conducted by the expert community and the federal executive government. An agreement on its implementation was signed with the Russian government. Under the agreement, a large-scale project was launched to develop a quantum computer.

JSC Atomenergoprom is building an integrated 'ecosystem' comprising a variety of R&D centres, research institutes, technology start-ups and university laboratories in order to efficiently coordinate joint initiatives on quantum computing. By the end of 2019, the Company had established partnerships with the Functional Micro/Nanosystems (FMN) Laboratory of Bauman Moscow State Technical University, the National University of Science and Technology MISIS and the Russian Quantum Centre, which cooperates with leading scientists worldwide. This will encourage Russian researchers to return from abroad in order to work in Russia.

The project is scheduled to be completed in 2024 and is being implemented jointly by key teams and organizations performing R&D in the sphere of quantum computing, as well as potential users of quantum technologies. ROSATOM and JSC Atomenergoprom are developing quantum computing for the benefit of the nuclear industry, ROSATOM's new businesses and the Russian economy as a whole. The use of quantum computers will enable a major breakthrough in solving a wide range of problems, such as modelling the behaviour of molecules to develop new drugs and tailored materials, complex logistical problems, big data management, etc.

One of the strategic objectives of digitization in Russia is to create a Russian-designed quantum computer, as this will help to close the gap separating the country from global technological leaders. Quantum computers are new-generation computers that are thousands of times more powerful than existing ones. Potentially, they will be able to perform those tasks that are currently impossible, including in the sphere of cybersecurity, artificial intelligence and the modelling of new materials.

In 2019, ROSATOM signed a memorandum of cooperation in the sphere of digital healthcare with PJSC Sberbank of Russia and the Federal Biomedical Agency. The cooperation involves developing a digital ecosystem in the healthcare sector. The ecosystem incorporating global best practice will enable effective operation of secure, government-controlled digital services for patients, healthcare regulators and healthcare institutions. Its key areas include decision-making support services (managerial, clinical, expert and those based on big data analytics and machine learning), including centralized diagnostic services; remote consultation, rehabilitation and health monitoring services; the Smart Clinic, which is a set of information systems and services using a combination of medical devices, information technologies and technical capabilities of the Internet of Things.

6.3. DIGITAL PRODUCTS

In 2019, the development of JSC Atomenergoprom's digital product portfolio was focused on six prioritized areas:

- Science-based modelling and R&D;
- Enterprise and production management;
- Digital infrastructure;
- Design and construction/digital twins;
- Information security and digital physical security;
- Digitization of municipal services and processes.

There are 'flagships' in each of these six areas. They were created by various Divisions and organizations of the Company, and the first customers for these products include major industrial,

SCIENCE-BASED MODELLING AND R&D

Logos

Logos is a package of digital products based on hardware and software developed by the Company over the years. Logos has been successfully introduced in more than 70 enterprises in different industries, such as aircraft engineering, engine manufacturing, transport engineering and nuclear power.

energy, and oil and gas companies, which are leaders in strategically important sectors of the Russian economy. At year-end 2019, the Company's 'digital' register included 149 products, 39 of which were developed by third-party organizations.

In 2018 and 2019, the Company officially launched its digital products on new commercial markets across all segments of its portfolio. Going forward, the key priority for the Company is to pool the industry expertise and to progress from local IT systems to developing digital products not only for the nuclear industry but also for other segments of the Russian economy.

The Logos suite comprises three digital products:

- Logos Aero-Hydro, which came onto the market in 2018; it is designed for the modelling of aero- and hydrodynamic processes;
- Logos Thermo, which was launched in 2019; it is designed for assessing thermal performance and behaviour of components and assemblies;

■ Logos Strength, which is scheduled to be launched on the market in 2020, can be used to solve static and dynamic strength problems.

Volna

Volna ('Wave') is a programming and computing system for engineering analysis; by the end of 2019, it had been adopted by a number of Russian gas pipeline operators.

ENTERPRISE AND PRODUCTION MANAGEMENT

Digital Enterprise FLCS

The Digital Enterprise full life cycle system (FLCS) is a management system designed for enterprises combining different types of production operations. The FLCS has a modular structure (the key modules are Enterprise Management, Production Management and Personnel Management). This approach

Prizma 2.0

Prizma ('Prism') 2.0 is a Russian-designed automated system for discrete production management. It has been designed specifically for instrumentation engineering enterprises in the Russian nuclear industry and other industries. The key

Technical Documentation E-Shop

The Technical Documentation E-Shop created by JSC Rosenergoatom is a state-of-the-art online service that can be used to search for, order and receive regulatory, research and design documents governing all stages of the life cycle of NPPs equipped with VVER reactors. At year-end 2019, the Shop

DIGITAL INFRASTRUCTURE

Data centres

The construction of data centres is one of the Company's priorities in the development of digital products. Core data centres forming part of a global network of data centres connected to NPPs are a major area. Data centres located at NPP sites have important competitive advantages, such as stable

A well-functioning user training and support system is an important prerequisite for promoting digital products on the market. In 2019, the Company opened a training centre where numerical simulation specialists from the nuclear and other industries will receive training in the use of all modules of the Logos software suite. In the future, the range of training programmes run by the centre and covering various digital products and competences will be expanded.

makes it possible to implement the system on a piecemeal basis and enables customers to further develop the product independently, as the source code of the system is made available to them.

advantages of this system include compliance with information security requirements, independence from vendors, and a high level of availability for fast deployment.

contained more than 1,100 technical documents (more than 75,000 pages) with abstracts. Foreign users can buy materials in English.

power supply and compliance with strict safety and security requirements (as safety and security measures at the sites are based on a multi-barrier principle). In 2019, the Kalininsky Data Centre in Udomlya (Tver Region) run in cooperation with PJSC Rostelecom started commercial operation; this is the first

project of this kind. This is one of Russia's largest data centres, with a rated capacity of 48 MW. The Company's data centres are ready to provide services to third-party customers on a commercial basis: for instance, the administration of the Tver Region has become the first customer of the Kalininsky Data Centre. *See also the section 'Power Engineering Division'.*

Automated Tool Storage System (ATSS)

The ATSS is a convenient and easy-to-use service in the 'smart cabinet' category, which illustrates how enterprises can apply new production technology in practice. The ATSS consists of a tool release module, a tool collection module and a control module. The system tracks and controls the release of tools to an enterprise's

Telecommunications equipment (access switches)

In 2019, the Company's Fuel Division launched a project to produce access switches (telecommunications hardware and software modules) for the Russian digital communications market. This project will enable the Division to become a key

DESIGN AND CONSTRUCTION/DIGITAL TWINS

Multi-D digital platform

Multi-D is a unique system that enables effective management of all stages of the life cycle of NPPs and other complex capital construction projects. The Multi-D platform has been designed to function regardless of any restrictions on software import and export. In addition, customers can connect components provided by other vendors or national software solutions.

INFORMATION SECURITY AND DIGITAL PHYSICAL SECURITY

Pilot Access Control System

The Pilot Access Control System is designed to check passes in real time using bar codes or RFID technology as visitors are entering secure facilities or public event venues. The Pilot Access Control System is a distributed information system covering buildings and structures (such as stadiums) in different cities. Its integration into the Smart City project makes it possible to

The Company has also commissioned a number of facilities whose capacity ranges from 5 kW to 150 kW: a modular data centre, a high-load data centre, a mobile data centre, a containerized data centre and even a micro data centre.

employees and their return in real time. Open protocol interfaces enable rapid ATSS integration into the IT environment of any enterprise, which helps to improve labour productivity and optimize warehouse storage.

supplier of high-technology solutions for building industrial telecommunications networks in Russia that will not rely on imported technology.

By the end of 2019, different configurations of the Multi-D platform had been implemented and were operated successfully as part of NPP construction projects in Russia (Kursk NPP-2), Egypt (El Dabaa NPP), Hungary (Paks II NPP) and Bangladesh (Rooppur NPP).

obtain all information on the attendance of public events in real time for managerial decision-making.

Prototypes of this system were successfully tested during the 2014 Winter Olympics in Sochi and the 2017 FIFA Confederations Cup. The Pilot Access Control System was in full use

during the 2018 FIFA World Cup and the 2019 Winter World University Games in Krasnoyarsk; by the end of the reporting year, it had been installed at stadiums across Russia.

In December 2019, the Pilot Access Control System won an award in the Contribution to Technological Development category at the Global Technology Leadership Forum.

6.4. INTERNAL DIGITIZATION

In 2019, a concept of integrated IT architecture was developed in the Russian nuclear industry. Measures were taken to ensure that IT resources are used more efficiently. The digital transformation process was fully provided with computing resources.

An industry centre was established to research, test and evaluate solutions that do not rely on imported technology. Key import substitution targets for 2022 were approved for Russian nuclear organizations. All projects forming part of the UDS potentially involve prioritizing the use of Russian-designed solutions. Projects were initiated to replace imported equipment for core systems in a number of areas, including ERP, standardized workstations for the industry, the integrated industry-wide document management system (IIDMS) and IT architecture for the industry.

To support the NPP construction process, automated handover of equipment specifications from the design and procurement functions was introduced. A digital dashboard for the site manager was piloted at Rooppur NPP (Bangladesh). The configuration of design systems was approved for the NPP in Uzbekistan.

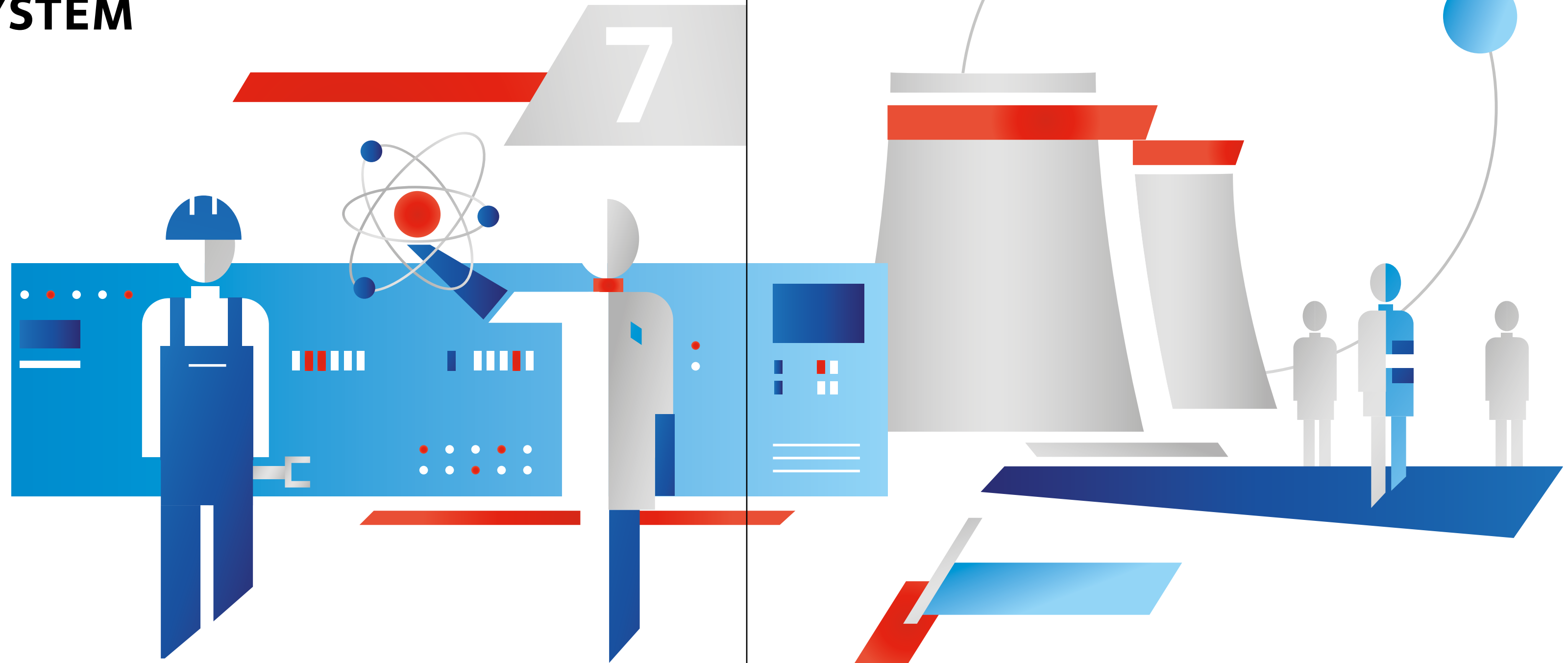
In the Company's overseas branches, an open-access document management system was introduced, and a two-way connection to the IIDMS was provided.

More than 9,000 cyberattacks were prevented in 2019. A system for raising users' awareness of information security matters started pilot operation.

In order to develop new production technologies, surveys were conducted in 27 Russian nuclear organizations to collect information on demand for solutions based on end-to-end digital technologies and prioritize the relevant needs. More than 40 projects based on end-to-end Industry 4.0 technologies were at the pilot operation stage in various organizations of the Corporation.

In the reporting year, the Company approved an approach to calculating economic benefits from digitization; at year-end 2019, they exceeded RUB 10 billion.

GOVERNANCE SYSTEM



7.1. CORPORATE GOVERNANCE

7.1.1. OBJECTIVES, PRINCIPLES AND MECHANISMS OF CORPORATE GOVERNANCE

JSC Atomenergoprom exercises its shareholder powers with regard to organizations in the nuclear industry in accordance with the applicable Russian corporate legislation. Since it holds 100% of JSC Atomenergoprom's voting shares, ROSATOM influences all of the shareholder's decisions. Thus, JSC Atomenergoprom's main goal with regard to organizations in the nuclear industry is to improve their performance in order to help to achieve the strategic objectives of ROSATOM.

Principles and mechanisms of corporate governance:

■ Standardization of governance in the organizations in the Russian nuclear power sector, organizations of various legal forms specializing in nuclear and radiation safety, nuclear science and technology and personnel training, with due regard to the special characteristics of each enterprise and organization;

■ Removal of non-operating and inactive companies from the nuclear industry and elimination of redundant corporate ownership levels;

■ Transfer of a number of optional issues to the level of cooperation between corporate governance bodies of organizations in the industry based on regulatory documents adopted in the industry with regard to various groups of business processes;

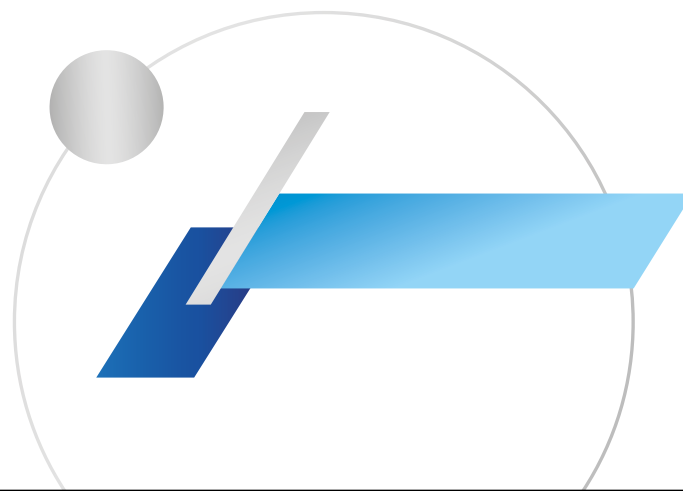
■ A division-based management model within the civilian part of the nuclear industry, which involves having core business divisions (Mining, Fuel, Mechanical Engineering, Power Engineering, Engineering, etc.) and a number of business incubators and industrial complexes.

7.1.2. GOVERNING BODIES

Board of Directors of JSC Atomenergoprom

Members of JSC Atomenergoprom's Board of Directors during the period from January 1, 2019 through December 31, 2019 (elected on June 29, 2018, with the same members re-elected on June 28, 2019):

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

Year of birth: 1973.
Place of birth: Leningrad.
Education: university degree.

Information on positions held by the member of the Board of Directors.

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

Year of birth: 1975.
Place of birth: Sverdlovsk.
Education: university degree.

Information on positions held by the member of the Board of Directors.

2011 – present – Deputy Director of JSC Atomenergoprom, Director for Investment Management and Operational Efficiency; Director for Economics and Investments, ROSATOM.
She does not own the Company's shares.

Ilya Rebrov

Year of birth: 1976.
Place of birth: Leningrad.
Education: university degree.

Information on positions held by the member of the Board of Directors.

2010 – present – Director of the Economics and Financial Controlling Department; Economics and Finance Director; Finance Director, ROSATOM.
He does not own the Company's shares.

Vladislav Korogodin

Year of birth: 1969.
Place of birth: Moscow.
Education: university degree.

Information on positions held by the member of the Board of Directors.

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.

Anna Miroshnichenko

Year of birth: 1978.
Place of birth: Murmansk.
Education: university degree.

Information on positions held by the member of the Board of Directors.

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.

Director of JSC Atomenergoprom

Kirill Komarov was appointed as Director of JSC Atomenergoprom as from April 14, 2015 (minutes of the meeting of JSC Atomenergoprom's Board of Directors No. 272 dated March 26, 2015).

7.1.3. REPORT OF THE BOARD OF DIRECTORS

In 2019, the Board of Directors held 41 meetings by absentee voting, including the following:

■ A meeting of the Board of Directors was held prior to the Annual General Meeting of Shareholders of JSC Atomenergoprom;

■ Additional issues of book-entry registered ordinary shares and book-entry registered preferred shares of JSC Atomenergoprom were registered;

■ 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 2019'*).

7.1.4. RESOLUTIONS OF THE SOLE SHAREHOLDER

Three resolutions of the sole shareholder were passed in 2019:

- Profit distribution for 2018;
- Election of the Board of Directors;

■ Dividend payment for 2018, for the six months of 2019 and for the nine months of 2019.

7.1.5. 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 2019, dividends for the nine months of 2018 were paid on book-entry registered ordinary shares held by ROSATOM and book-entry registered preferred shares held by the Russian Ministry of Finance representing the Russian Federation; the dividends totalled RUB 6,500 million and RUB 382 million respectively.

Under the resolution of ROSATOM as the holder of 100% of voting shares in JSC Atomenergoprom, in June 2019, dividends for 2018 were declared and paid within the prescribed time frame; the dividends totalled RUB 8,311 million, including RUB 7,850 million on ordinary shares and RUB 461 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 2019, interim dividends for the first half of 2019 were declared and paid within the prescribed time frame; the dividends totalled RUB 2,647 million, including RUB 2,500 million on ordinary shares and RUB 147 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 2019, interim dividends for the nine months of 2019 were declared and paid within the prescribed time frame; the dividends totalled RUB 4,997 million, including RUB 4,720 million on ordinary shares and RUB 277 million on preferred shares.

7.1.6. MAJOR TRANSACTIONS AND NON-ARM'S LENGTH TRANSACTIONS

Major transactions

In 2019, JSC Atomenergoprom did not conclude any transactions recognized as major transactions under the Russian legislation and subject to approval by the Company's authorized governing body.

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.

7.1.7. KEY CHANGES IN THE CORPORATE STRUCTURE IN 2019

To promote its digital product portfolio on the market and to manage internal digitization programmes and projects, JSC Atomenergoprom established LLC Rusatom Digital Solutions and Private Institution for Digitization of the Nuclear Industry Cifrum.

To improve digital development processes in the electric power industry, JSC Rosenergoatom together with JSC Inter RAO – Electric Power Plants, JSC SO UPS and JSC UPS EC Real Estate established the Association of Digital Industry Development Organizations Digital Energy.

To create an industry integrator of logistical services and develop a new international business, JSC Atomenergoprom established a wholly owned subsidiary, LLC Rusatom Cargo.

To develop the logistics business in the industry, JSC Atomenergoprom acquired a 30% shareholding in Delo Group, a major Russian intermodal container terminal operator.

To ensure effective implementation of the Akkuyu NPP construction project in Turkey, JSC CONCERN TITAN-2 and a Turkish company IC İçtaş İnşaat Sanayi ve Ticaret A.Ş. established a joint venture operating on the site of Akkuyu NPP as a contractor.

To launch the production of sports goods made of composite materials at an existing enterprise, JSC RPC Khimpromengineering acquired a shareholding in LLC ZARYAD.

To promote services provided by the data centre in Udomlya, JSC Rosenergoatom and LLC LinKey, an international data centre operator, established a joint venture, JSC ATOMDATA, on a parity basis.

To implement the project to build the Multipurpose Fast Neutron Research Reactor (MBIR) in cooperation with its foreign partners, JSC Atomenergoprom established a wholly owned subsidiary, LLC IRC MBIR Consortium Leader.

The Bank of Russia registered additional issues of ordinary and preferred shares of JSC Atomenergoprom and the accompanying prospectus; the share issuance is aimed at raising funds for NPP construction projects abroad.

7.1.8. 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 organizations

(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).

7.1.9. KEY PROVISIONS OF JSC ATOMENERGOPROM'S POLICY ON REMUNERATION AND/OR REIMBURSEMENT OF EXPENSES; INFORMATION ON REMUNERATION AND/OR REIMBURSEMENT OF EXPENSES

No decisions were taken in 2019 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.

the Standardized Industry-Wide Remuneration System instituted by ROSATOM. Remuneration, including salary, is paid to Board members who are full-time employees in accordance with employment contracts and applicable local regulations of the Company/ROSATOM on remuneration²⁸.

Board members who are full-time employees of the Company/ROSATOM are remunerated for their work in accordance with

7.2. RISK MANAGEMENT

7.2.1. RISK MANAGEMENT SYSTEM

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.

²⁸ 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-korrupsii/svedeniya-o-doxodax-robotnicov>.

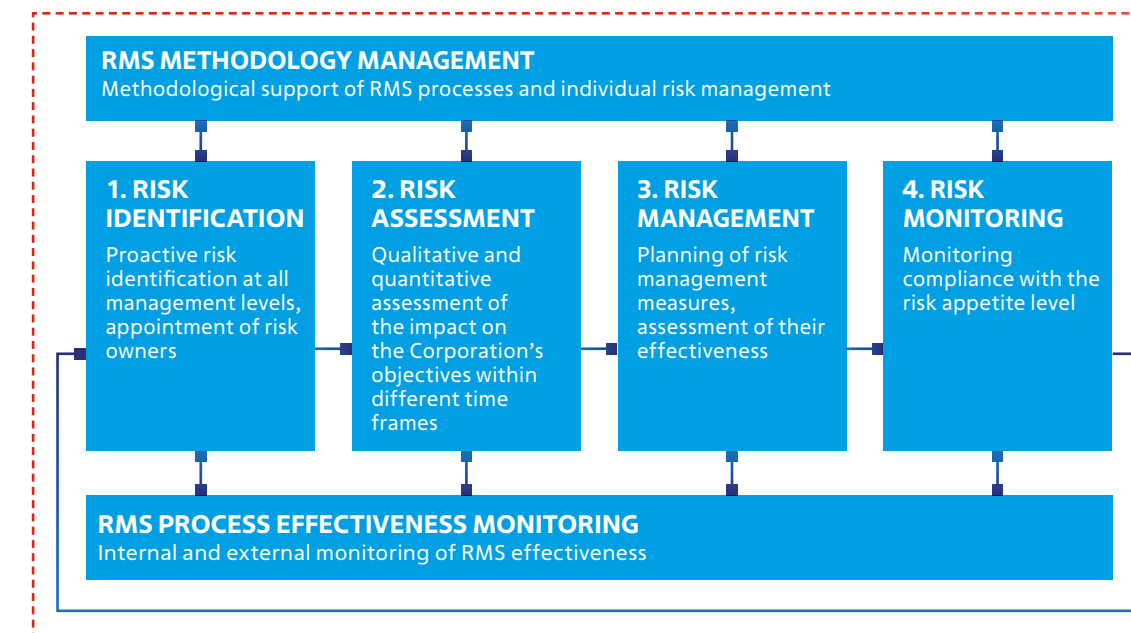
In 2019:

- 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 quantitative risk assessment was carried out for NPP construction projects²⁹;
- A list of key risks of JSC Atomenergoprom and its organizations and a matrix of responsibility for the management of key risks were approved;

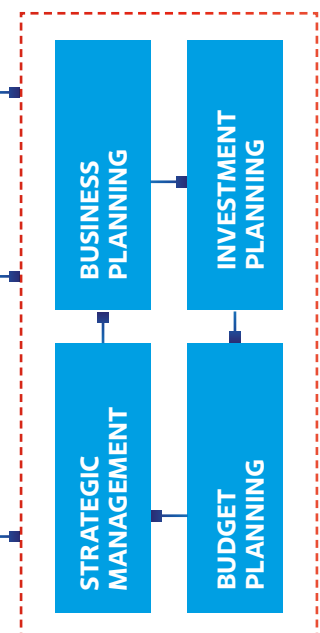
- An approach to early response to risks was developed and approved: a list of key risk indicators was compiled, including a description, sources of information, the calculation algorithm and frequency, thresholds (warning and response thresholds); an expert assessment of key risk indicators was carried out, and data on changes in their levels was collected;
- Risk management practices forming part of maintenance processes in NPP construction projects in Russia and abroad were gathered;
- Risk management measures were implemented in accordance with recommendations based on the findings of a comprehensive thematic audit of efficiency of cross-divisional cooperation on the Akkuyu and Hanhikivi NPP construction projects.

RISK MANAGEMENT PROCESS AT JSC ATOMENERGOPROM

RMS PROCESSES



REPORTING ON RISKS IN THE PLANNING PROCESS



²⁹ An assessment using the Monte Carlo method was carried out for Hanhikivi NPP (Finland), Akkuyu NPP (Turkey) and Rooppur NPP (Bangladesh). A parametric assessment was carried out for Kudankulam NPP (India, power units No. 3-6), El Dabaa NPP (Egypt), Akkuyu NPP (Turkey), Rooppur NPP (Bangladesh), Paks NPP (Hungary), Kursk NPP-2 and the Uzbek NPP (Uzbekistan).

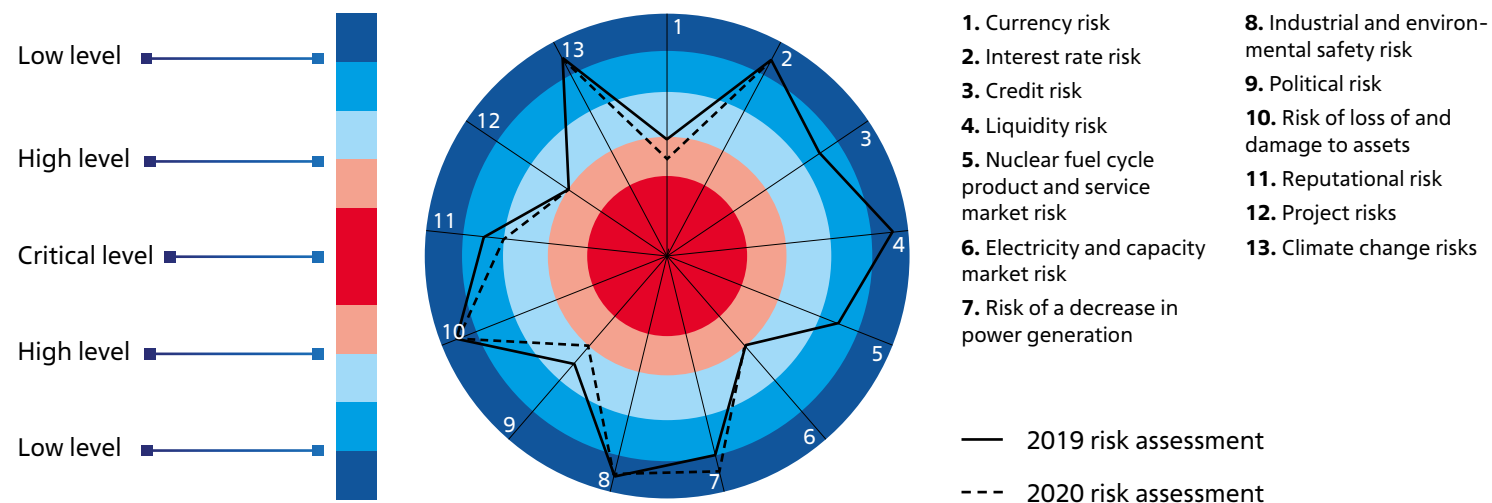
ORGANIZATIONAL MODEL OF THE RISK MANAGEMENT SYSTEM



7.2.2. KEY BUSINESS RISKS³⁰

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

RISK RADAR



³⁰ 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.

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

critical risks and the Company's strategic goals is shown in section 7.2.3.

7.2.3. RISK MANAGEMENT OUTCOMES IN 2019



Change in estimated risk levels for 2020:


↑ increase ↓ decrease ○ no significant changes

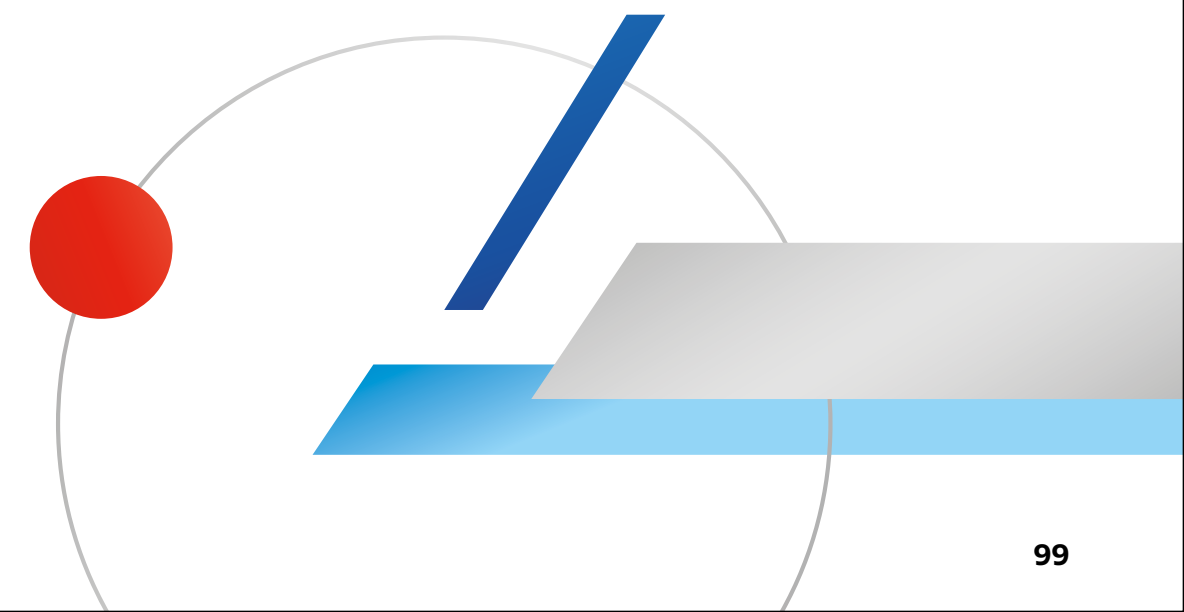
The Company's strategic goals:



- 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: <ul style="list-style-type: none"> ■ 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.	1 2 3
		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: Due to high exchange rate volatility as at the beginning of 2020, the risk tends to increase.	

Risks and changes in risk levels (risk owners)	Risk description	Risk management practices	Connection with strategic goals
Financial risks			
2. Interest rate risk  (ROSATOM's Treasury Department)	Adverse changes in interest rates, different timing of interest income and interest expenses	Management approaches: <ul style="list-style-type: none"> 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. It has not raised any loans with interest rates linked to the refinancing rate/key rate of the Bank of Russia; 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 average interest rate on the total debt portfolio was reduced to below 5% per annum, partly due to the refinancing of both the rouble-denominated and foreign-currency-denominated portions of the credit portfolio. The reduction in the risk level in 2019 was due to the effective use of the risk management approaches described above, 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. <i>For details, see the section 'Financial Management'.</i>	1 2 3
3. Credit risk  (ROSATOM's Treasury Department for banks; executives of the Company's organizations for other counterparties)	Failure by counterparties to fulfil their obligations in full and on time	Management approaches: <ul style="list-style-type: none"> 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 minimized. Bank guarantees were not called upon under revenue contracts.	1 2

Risks and changes in risk levels (risk owners)	Risk description	Risk management practices	Connection with strategic goals
Financial risks			
4. Liquidity risk  (ROSATOM's Treasury Department / Heads of Divisions)	Lack of funds for the fulfilment of obligations by the Company and its organizations	Management approaches: <ul style="list-style-type: none"> Centralized 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 organizations; Maintaining credit ratings assigned to JSC Atomenergoprom by the 'Big Three' international rating agencies (S&P, Moody's and Fitch), by JSC Expert RA and other rating agencies at the level of Russia's sovereign credit rating. Results: The Company maintained sufficient liquidity to repay liabilities on time, preventing unacceptable losses and reputational risk. <i>For details, see the section 'Financial Management'.</i>	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: <ul style="list-style-type: none"> 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: Despite continuing price and demand stagnation on nuclear fuel cycle product and service markets, in 2019, the revenue target was exceeded.	<div style="text-align: center;">1</div> <div style="text-align: center;">2</div> <div style="text-align: center;">4</div>
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.	<div style="text-align: center;">1</div>
Results: In 2019 (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. There were no significant changes in the impact of these factors on electricity and capacity prices in 2019 compared to 2018.			
The risk level remains unchanged, as the fact that natural uranium prices and separative work unit prices are currently low limits their further reduction and at the same time creates growth opportunities if the market environment is favourable. <i>For details, see the section 'International Business'.</i>			


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: <ul style="list-style-type: none"> 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). 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.	<div style="text-align: center;">1</div>
8. Industrial and environmental safety risk  (Executives of the Company's Divisions)	Major accidents/incidents in nuclear enterprises	Management approaches: <ul style="list-style-type: none"> Comprehensive risk surveys in key manufacturing enterprises, followed by the development and implementation of risk mitigation plans; Developing and implementing business insurance programmes based on the findings of risk surveys; Implementing measures to improve occupational safety and health performance in enterprises, including measures to improve the safety of employees and local communities in the Company's regions of operation and to maintain the balance of local ecosystems; Upgrading process equipment in enterprises; Ensuring compliance of production processes with applicable standards; Arranging civil liability insurance for enterprises; Providing an up-to-date legal framework; Engineering measures to ensure the safety of nuclear facilities; Maintaining a high level of professionalism and safety culture among employees. Results: Safe operation of nuclear facilities and hazardous industrial facilities. <i>For details, see the section 'Nuclear and Radiation Safety; Occupational Safety and Health'.</i>	<div style="text-align: center;">1</div> <div style="text-align: center;">3</div>

Risks and changes in risk levels (risk owners)	Risk description	Risk management practices	Connection with strategic goals
Operational risks			
9. Political risk ↑ (International Cooperation Department of ROSATOM)	Changes in the regulatory and political climate in foreign countries imposing restrictions on the operations of the Company and its organizations	Management approaches: <ul style="list-style-type: none"> ■ Coordination with the Russian Ministry of Foreign Affairs and other authorities; using the relevant intergovernmental mechanisms; ■ Providing political support for global operations of nuclear organizations; ■ Using the platform of specialized international organizations for communication and awareness campaigns; ■ Establishing partnerships with local and foreign regional companies and searching for alternative partners; ■ Examining alternative options for the supply of equipment that has been produced by the Company or is in production; ■ Developing and implementing action plans in the event of sanctions, as well as responding to the tightening of existing and the imposition of new trade restrictions on target end markets; ■ Obtaining general export licences; ■ Taking into account political interests of governments in the Company's end markets. Results: 7 intergovernmental agreements and 23 major interdepartmental agreements were concluded, which is a positive trend.	1 2 3
		Changes: The risk tends to increase, as persisting sanctions pressure on Russian individuals and legal entities generally increases uncertainty over the possibility of implementation of specific economic projects. <i>For details, see the sections 'International Cooperation' and 'International Business'.</i>	

Risks and changes in risk levels (risk owners)	Risk description	Risk management practices	Connection with strategic goals
Operational risks			
10. 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	1 2
		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 June 29, 2018.	
		The Company continued to develop the legal and organizational anti-corruption framework and to ensure compliance with anti-corruption laws and managerial decisions.	
		Systematic measures were taken to prevent and resolve conflicts of interest.	
		Executives of new businesses established in the nuclear industry were informed about prioritized anti-corruption measures, including the industry-wide anti-corruption regulations to be implemented in the organizations.	
11. Reputational risk ↑ (Communications Department of ROSATOM and Heads of Divisions)	Changes in stakeholder perception of the trustworthiness and appeal of the Company and its organizations	Management approaches: <ul style="list-style-type: none"> ■ 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 the nuclear industry 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; ■ If it is reasonable to make changes to the schedule of NPP construction projects in Russia and abroad, the relevant decisions are agreed with all parties involved in the projects and are reflected transparently in communications with partners and other stakeholders (including the general public and local communities); 	1 3

Risks and changes in risk levels (risk owners)	Risk description	Risk management practices	Connection with strategic goals
Operational risks			
11. Reputational risk  (Communications Department of ROSATOM and Heads of Divisions)	Changes in stakeholder perception of the trustworthiness and appeal of the Company and its organizations	<ul style="list-style-type: none"> ■ 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 (including ATOMEXPO) as speakers/delegates; ■ The Company publishes printed materials (brochures, leaflets) to raise public awareness about the nuclear power industry. <p>Results: Overseas projects are supported by government bodies. The main Russian nuclear industry exhibition, ATOMEXPO 2019, titled ‘Nuclear for Better Life’ was attended by over 4,000 specialists and experts from 74 countries worldwide.</p> <p>The findings of an opinion poll conducted in local communities near the construction site of Hanhikivi 1 NPP in Finland show that the level of public acceptance of the project increased from 73% to 75% in 2019 (the opinion poll was commissioned by Fennovoima and conducted by a Finnish company Norstat in November and December 2019).</p> <p>Between September and December, more than 10 scheduled public events were held in Turkey and received widespread positive coverage in the Turkish media (in Turkey, the Company is building Akkuyu NPP).</p> <p>According to an opinion poll by Levada-Centre, in 2019, 73.7% of the Russian population supported the use of nuclear power. Over the past few years, this figure remains persistently high.</p> <p>According to data in the Medialogia automated media monitoring and analysis system, in 2019, 95.4% of publications about the Russian nuclear industry were positive or neutral.</p> <p>The Company received a number of prizes and awards in the sphere of personnel management. In March 2019, ROSATOM topped the Ranking of the Best Russian Employers compiled by HeadHunter.</p> <p>A high level of transparency in ROSATOM is confirmed by the fact that it was included in the top groups in the 2019 Sustainable Development, Corporate Responsibility and Transparency Indices compiled by the Russian Union of Industrialists and Entrepreneurs (RSPP) and that the quality of ROSATOM’s public annual report was assessed as high (the report for 2018 was awarded 5 stars (the highest rating) in the annual competition held by the RAEX-Analytics agency).</p>	<div style="display: flex; flex-direction: column; align-items: center;"> <div style="background-color: #0070C0; color: white; padding: 2px 5px; margin-bottom: 5px;">1</div> <div style="background-color: #0070C0; color: white; padding: 2px 5px; margin-bottom: 5px;">3</div> </div>

Risks and changes in risk levels (risk owners)	Risk description	Risk management practices	Connection with strategic goals
Operational risks			
		Systematic work initiated by ROSATOM and JSC Atomenergoprom to incorporate international sustainability principles and approaches into their operations and establish the relevant communication with stakeholders (via the corporate website, public reports, messages from senior executives, participation in specialized conferences, etc.) made an important contribution to strengthening the reputation of ROSATOM and the Company.	
		<p>Changes: An increase in the risk level was due to its strong correlation with political risk. <i>For details, see the sections ‘Stakeholder Engagement’ and ‘Personnel Management’.</i></p>	
12. 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	<p>Management approaches:</p> <ul style="list-style-type: none"> ■ Improving project management practices; ■ Developing action plans for the interaction with foreign customers; ■ Concluding long-term contracts stipulating fixed electricity prices; ■ Developing standardized 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; integrating the capabilities of the Company’s organizations in the sphere of development and operation of digital production facilities (including based on the Virtual Printer digital platform), supply of 3D printers and the relevant materials, and construction and operation of additive manufacturing centres in Russia and abroad. <p>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).</p> <p>A pilot facility assembling 3D printers and producing components was put into operation.</p>	<div style="display: flex; flex-direction: column; align-items: center;"> <div style="background-color: #0070C0; color: white; padding: 2px 5px; margin-bottom: 5px;">1</div> <div style="background-color: #0070C0; color: white; padding: 2px 5px; margin-bottom: 5px;">3</div> <div style="background-color: #0070C0; color: white; padding: 2px 5px;">4</div> </div>

Risks and changes in risk levels (risk owners)	Risk description	Risk management practices	Connection with strategic goals
Operational risks			
13. Climate risk  (Executives of the Company's Divisions)	Adverse climate change/impacts of natural disasters on the operations of the Company and its organizations	Management approaches: <ul style="list-style-type: none"> 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. 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. JSC Atomenergoprom 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 disasters.	<div style="text-align: center;">1</div> <div style="text-align: center;">4</div>

OTHER RISKS

SOCIAL AND REGIONAL RISKS (INCLUDING THE RISK OF EPIDEMIC OUTBREAKS, ETC.)

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 organizations are characterized by a high level of financial stability sufficient to withstand the negative economic consequences of social and regional risks.

LICENSING RISKS

JSC Atomenergoprom 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 organizations are situated have well-developed infrastructure and transport links. JSC Atomenergoprom's organizations implement preventive measures to ensure reliable supplies: they maintain emergency stocks of materials and

equipment, organize exercises for emergency response and recovery teams and implement other measures to ensure the continuity of production and logistical processes.

7.2.4. RISK INSURANCE

Risk insurance is one of the main risk management approaches used by JSC Atomenergoprom. To improve the reliability of insurance coverage, in 2019, 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. This proves that the international nuclear insurance

community acknowledges the safety and reliability of Russian NPPs to be adequate. In-house insurance audits were conducted with assistance from experts of the Russian Nuclear Insurance Pool.

Key enterprises in the industry will continue to be audited for insurance purposes in 2020.

7.2.5. OBJECTIVES FOR 2020 AND FOR THE MEDIUM TERM

The Company has developed an action plan for 2020 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.

7.3. FINANCIAL MANAGEMENT

Key results in 2019:

- A total of RUB 37.1 billion was saved through intra-group financing between 2010 and 2019.
- Russian and international rating agencies rated JSC Atomenergoprom at the level of Russia's sovereign credit ratings.

7.3.1. FINANCIAL MANAGEMENT

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 sustainability of nuclear organizations in a changing environment. The financial strategy is an integral part of JSC Atomenergoprom's overall business strategy. Its main goal is to ensure the financial sustainability of the Company and its organizations and to maximize the efficiency of financing and financial risk management.

Key financial transactions of JSC Atomenergoprom have been centralized. Cash flow management is centralized 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 the Treasury Department. The established treasury structure enables 100% control of funds in the industry;

- Concentration of principal treasury functions of nuclear organizations in the Treasury Department, which communicates with nuclear organizations 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 Corporation on a daily basis.

Targets for 2019 in the sphere of cooperation with banks, development of the cash pool and debt management set out in the financial strategy have been achieved.

In order to improve the performance of the treasury functions, in 2019, the Company continued to work towards:

- Accumulating spare cash in the accounts of pool leaders³¹;
- Improving the accuracy of payment scheduling (a rolling liquidity forecast);

³¹ A pool leader is an organization on whose accounts spare cash is accumulated and subsequently redistributed between organizations in the industry through loan agreements. A pool leader is appointed under the resolution of ROSATOM's executive bodies.

- Maintaining a competitive cost of servicing of the consolidated debt portfolio;
- Centralizing treasury transactions (complying with the financial policy);
- Introducing project financing instruments as part of project implementation by the Company and its organizations.

7.3.2. 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 December 31, 2019, JSC Atomenergoprom was rated at the level of Russia's sovereign credit ratings:

In 2019, the Company continued to work towards further centralization of the treasury function, including the development of a Payment Factory at JSC Atomenergoprom. This project is aimed at improving the performance of the treasury function in the industry.

- 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.

7.3.3. RAISING FINANCING FOR DAY-TO-DAY OPERATIONS AND FOR PROJECTS

In 2019, the average interest rate on the total debt portfolio denominated in Russian roubles was maintained below 8.4%. Throughout 2019, the Company maintained sufficient liquidity or sources of liquidity (credit facilities, etc.) to repay liabilities on time, preventing unacceptable losses and reputational risk.

The Company continued to use suretyship to secure obligations of organizations 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).

JSC AtomCapital (a wholly owned subsidiary of ROSATOM acting as a pool leader in intra-group financing of FSUEs) enabled an optimal debt burden distribution between JSC Atomenergoprom and organizations and enterprises outside its scope.

In the reporting year, the Company continued to search for sources of financing for projects in traditional and new business areas:

Wind power

The limit under a credit facility agreement with JSC Gazprombank was increased by RUB 5.5 billion to RUB 69.7 billion as part of a project finance arrangement for the construction of a wind farm with installed capacity totalling 660 MW.

BOO projects

Independent advisors were engaged to conduct comprehensive due diligence for the Hanhikivi 1 NPP construction project.

Loan and collateral documents worth a total of USD 400 million were signed with PJSC Sberbank as part of the Akkuyu NPP construction project. The Company continued to take steps to obtain guarantee support for the project: agreement with Bpifrance on export credit support was formalized in the outcome document of the 25th session of the Franco-Russian Economic, Financial, Industrial and Trade Council (CEFIC) held in December 2019.

Concession projects in the utilities sector

A project finance arrangement was implemented as part of a project to renovate water supply and sewerage systems in the town of Lesnoy (Sverdlovsk Region). The acquisition of a shareholding in LLC RIR-Lesnoy by PJSC Sovcombank was closed; the bank also acts as the lender under the deal.

Multipurpose fast neutron reactor

A target scenario for sources of financing was prepared using the tools of the VEB.RF Project Finance Factory. A syndicate comprising VEB.RF and JSC Gazprombank was selected as the financial partner of the project; their participation was approved by the VEB.RF Supervisory Board.

Industrial waste

A target financing structure was developed for the Infrastructure for the Management of Hazard Class 1 and 2 Waste

Federal Project and commercial projects forming part of RO-SATOM's strategic programme for industrial and consumer waste management.

Nuclear medicine

A provisional financing structure was developed jointly with VEB.RF for the construction of a nuclear medicine centre on Russky Island (Primorsky Territory) and a radiology department building including a positron emission tomography centre in Irkutsk.

In 2019, the Ministry of Industry and Trade of Russia approved corporate competitiveness improvement programmes (CCIPs) for a number of JSC Atomenergoprom's organizations (JSC AECP, PJSC ZiO-Podolsk, JSC NovaWind). Organizations implementing CCIPs are granted access to preferential government loans.

7.3.4. MAKING THE RUSSIAN NUCLEAR INDUSTRY MORE ATTRACTIVE TO INVESTORS

In 2019, the Company continued to take steps towards making the Russian nuclear industry more attractive to investors, engaging strategic investors in NPP construction projects in Russia and abroad, maintaining relationships with existing investors and lenders, and establishing relationships with and setting limits on credit facilities in new banks.

Cooperation agreements were signed with financial institutions on the sidelines of business forums (the 2019 Saint Petersburg International Economic Forum, the Sochi Investment Forum, etc.); the agreements covered projects and digitization initiatives being implemented by the Company and its organizations.

During the year, the Company organized visits to Leningrad NPP-2, which is currently under construction, and the construction site of the Adygea Wind Power Plant for representatives of Russian and foreign banks.

A round-table session titled 'Investment in Sustainable Development: Opportunities and Challenges' was held as part of the ATOMEXPO 2019 International Forum.

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 the Company's organizations).

7.3.5. PLANS FOR 2020 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 organizations;

- To continue to centralize 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 lenders and rating agencies.

7.4. INVESTMENT MANAGEMENT

Key results in 2019:

- The investment programme was 75% completed.
- Return on the investment portfolio stood at 11.3%.



7.4.1. KEY APPROACHES TO INVESTMENT MANAGEMENT

To take into account the interests of all value chain participants, a large number of decision-makers and experts grouped into collective or advisory bodies are engaged in investment decision-making. The decision-making level (top management or Division level) depends on the strategic importance of a project. Decisions on key milestones of projects vital for the Company are made and the projects are monitored at the top level.

An independent verification procedure (in relation to the project initiator) has been established to improve the efficiency of investment decisions.

A project portfolio made up of projects of organizations in the industry is built for a year and for the medium term based on available investment resources, which are calculated based on

the financial stability requirements for the group of companies and the required rate of return on investment.

Progress on projects in the organizations in the industry is monitored on a quarterly basis.

A phase-gate approach is applied to project implementation.

A comprehensive audit is conducted, which helps to formulate recommendations on how to improve investment project planning and implementation.

Measures to raise external financing, including project financing, are being developed.

7.4.2. RESULTS IN 2019

The investment programme of the Russian nuclear industry was 75% completed³². The investment programme was not implemented in full (including in the Company's Divisions) due to the deferral of financing for certain projects to subsequent reporting periods.

Return on the investment portfolio as a whole stood at 11.3%, while return on the portfolio excluding unprofitable projects (projects that do not produce economic benefits) reached 29.0%.

³² Including the investment programme of JSC Rosenergoatom.

OPERATIONS OF THE INDUSTRY VENTURE FUND

A venture fund, Digital Evolution Ventures, founded by JSC Atomenergoprom and LLC Orbita Capital Partners, operates in the Russian nuclear industry. The fund focuses on developing new businesses in promising sectors of the Russian and global economy.

Since the establishment of the fund, ROSATOM's Investment Committee has reviewed 18 high-technology projects, 5 of which (in such areas as Energy Storage Systems, the Smart City, Digital Medicine and Artificial Intelligence) have been provided with funding. A list of about 150 promising projects worth a total of more than RUB 4 billion has been compiled.

Measures to improve investment efficiency

In the reporting year, the Company updated the Comprehensive Programme of Measures to Improve the Maturity of Project Management in the Russian Nuclear Industry.

Employees in the industry continued to develop their competences at the Project Management School. 577 people underwent assessment and subsequent training in 2019.

7.4.3. CHALLENGES IN THE REPORTING PERIOD AND MITIGATION MEASURES

Challenges	Mitigation measures
Slow processes in the sphere of new business development	<ul style="list-style-type: none"> Decentralization of the decision-making system through an expansion of the scope of the Divisions' powers Reducing the number of approvals and decision-making bodies, which will make it possible to speed up the launch of new businesses and reduce the load on the management
Organizational environment that is not conducive to the implementation of digitization projects	<ul style="list-style-type: none"> Simplifying project formats; gathering best practices for the preparation of materials for investment decision-making bodies and communicating these practices to project teams Adapting the decision-making system for digitization projects; establishing the Quick Start Committee for investing in ideas with a budget totalling less than RUB 10 million
Lack of R&D integration with business initiatives	<ul style="list-style-type: none"> Adopting a 'one-stop-shop' approach to all investment decisions concerning the Company's scientific research efforts (a Council for Investing in Scientific Projects has been formed; its powers were delineated from those of other collective bodies responsible for innovation management) Increasing the level of maturity of investment and project management in the industry Preparing methodological guidelines for expert assessment of technological maturity of projects <p><i>See also the section 'Research and Innovations'.</i></p>

7.4.4. PLANS FOR 2020 AND FOR THE MEDIUM TERM

- To develop project methodology on a systematic basis;
- To implement the Comprehensive Long-Term Programme of Measures to Improve the Maturity of Project Management in the Company and Its Organizations;
- To form business partnerships in order to develop technologies, research and technological capabilities in the Company and its organizations;
- To digitize projects and investment activities.

7.5. INTERNAL CONTROL SYSTEM

Key results in 2019:

- ROSATOM topped the ranking of chief federal budget administrators compiled by the Federal Treasury of Russia.
- Inspections conducted in Russian nuclear organizations by Russian government bodies did not reveal any major violations that had not been detected by the industry-wide Internal Control and Audit Function.

The internal control system is based on:

- Russian laws and regulations;
- The IAEA requirements;
- The COSO model (The Committee of Sponsoring Organizations of the Treadway Commission);
- Guidelines for Internal Control Standards for the Public Sector by the Internal Control Standards Committee of the International Organization 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 organizations for advisory services provided by the Internal Control and Audit Function (ICAF).

7.5.1. RESULTS IN 2019

INSPECTIONS CONDUCTED IN ORGANIZATIONS

In the reporting year, ROSATOM's specialized internal control bodies (SICBs) conducted 704 inspections in Russian nuclear organizations.

External supervisory bodies conducted 15 inspections, including assessment of compliance with the budget legislation;

these included 6 inspections and 4 expert reviews 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 622 corrective measures and approved them for implementation, with more than 97% of these measures implemented in the reporting year.

PROFESSIONAL DEVELOPMENT OF AUDITORS

To support professional development of auditors, in 2019:

- A 'mentoring' practice was adopted: auditors from nuclear organizations participate in inspections conducted by the Company's ICAF in order to share experience; for each thematic audit, a training session is held, which is attended by SICB employees;
- Training was organized for SICB employees in the following areas: business process audit, project activities, performance evaluation of the internal control function and the risk management system, and IT audit;

- Large-scale certification in accordance with the Internal Control Specialist (Internal Control) professional standard was conducted for the first time in Russia;
- Standard internal audit programmes were included in the best practice library forming part of the 1C IT system supporting the ICAF activities.

In the reporting year, an internal audit was conducted to assess the efficiency of cooperation between Russian nuclear organizations in the sphere of NPP design abroad. Recommendations were produced for improving the efficiency of design work and adopting a more customer-centric approach.

HR POLICY AND SOCIAL RESPONSIBILITY

8



8.1. PERSONNEL MANAGEMENT

Key results in 2019:

- The average monthly salary totalled RUB 88,150 per month.
- 32.7% of employees were aged under 35.
- 828 graduates of core universities were hired by the Company.

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

In 2019, JSC Atomenergoprom and its organizations employed 140,660 people. 84,200 employees have a university degree. 1,484 employees are Candidates or Doctors of Sciences.

The age of employees averaged 42.5 years. 32.7% of employees were aged under 35.

8.1.1. PERSONNEL COSTS

In 2019, personnel costs totalled RUB 199.6 billion, up by 19.2% year on year. The costs per employee increased from RUB 1,373,000 in 2018 to RUB 1,419,000 in 2019 (up by 3.3% year on year).

STRUCTURE OF PERSONNEL COSTS, %

	2017	2018	2019
Payroll fund	75.0	74.6	74.6
Insurance contributions	20.4	20.9	21.0
Social and other expenses (including personnel training)	4.6	4.5	4.4

REMUNERATION SYSTEM

The current remuneration system in the Company:

- Provides competitive remuneration matching the compensation in the best Russian companies;
- Is result-based: the size of employees' salaries is linked to their efficiency, professionalism and achievement of key performance indicators (KPIs).

The Company has in place a flexible remuneration system which includes a variety of tools ensuring that employees achieve business targets and are closely focused on results.

Managerial KPIs are based on strategic goals, priorities and KPIs; strategic objectives set for the organizations are converted into KPI maps of their executives and cascaded down to business units and employees.

In 2019, the monthly average salary per employee in JSC Atomenergoprom increased by 3.3% against 2018 and totalled RUB 88,150 per month.

8.1.2. 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 executive 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 by their target position:

- ROSATOM's Assets and ROSATOM's Assets: Basic Level (top 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 4,300 people. ESP members account for 84% of appointments to the position of Chief Executive Officer in nuclear organizations and enterprises.

NUMBER OF ESP MEMBERS, WITH A BREAKDOWN BY GENDER

Gender	2017		2018		2019	
	Number	Share	Number	Share	Number	Share
men	2,148	80%	2,884	79%	3,407	79%
women	540	20%	765	21%	923	21%

APPOINTMENT OF ESP MEMBERS TO NEW POSITIONS, %³³

	2017	2018	2019
Share of ESP members appointed to vacant top and senior executive positions (top 30 and top 1,000 executives in the industry)	57.7	63.6	67.5
Share of ESP members among senior, middle-level and junior executives appointed to a new (managerial) position	45	72	74

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 2019, ESP

members completed a module-based training programme aimed at developing managerial knowledge and skills.

³³ In 2018, promotion of succession pool members was assessed based on the number of ESP members appointed to new positions during the last three reporting years. In 2019, the assessment focused on the share of promoted succession pool members included in the ESP in 2017.

TRAINING AS PART OF ESP DEVELOPMENT PROGRAMMES

ESP level	Development programme	Key training areas	Number of participants ³⁴		
			2017	2018	2019
Senior executives	ROSATOM's Assets	Strategy, strategic leadership, horizontal cooperation, change management, finance, marketing for high-technology companies	295	304	324
	ROSATOM's Assets. Basic Level		114	180	250
Middle-level executives	ROSATOM's Capital	Leadership and project management, advanced managerial skills, data management	1,102	1,490	1,800
Junior executives	ROSATOM's Talents		1,177	1,675	1,956
Total			2,688	3,649	4,330

8.1.3. SUCCESSOR ASSESSMENT

To facilitate rapid development of competences, which is one of the priorities of the Company's HR policy, an innovative approach to assessing high-potential employees has been adopted 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. This

approach is based on best practices adopted in major international companies; it was piloted in 2018. In 2019, the approach was rolled out in five divisions in the industry; the assessment covered 1,700 executives in 51 organizations. About 30% of successors covered by the assessment have been appointed to new managerial positions.

8.1.4. PERSONNEL TRAINING

The Company's HR policy prioritizes the development of competences and employee training. In 2019, over 94,000 employees

of JSC Atomenergoprom underwent training and retraining and completed professional development programmes.

ANNUAL AVERAGE TRAINING HOURS PER EMPLOYEE BY EMPLOYEE CATEGORY

Employee category	2017	2018	2019
Executives	53.9	45	55.8
Specialists and white-collar workers	35.3	21.7	30.7
Blue-collar workers	47.8	34.9	33.1

³⁴ The number of members included in the ESP is shown as a cumulative total for the period from 2017 through 2019.

DIGITAL COMPETENCES AND CULTURE

2019 saw the launch of a new focus area of the Digital ROSATOM strategic programme: Digital Competences and Culture.

Key outcomes:

- Primary demand for IT specialists until 2024 was assessed, and key IT positions were identified; a diagnostic assessment of maturity of the digital culture was carried out; a single industry-wide onboarding programme was developed;
- About 45,000 employees in the industry were covered by face-to-face and online programmes aimed at promoting digital literacy and developing IT competences. An application for online training, RECORD Mobile, was developed, and the RECORD Mobile web portal was created;
- The Company launched a new training format for digitization leaders: the Digital Seasons Production Technology Club; it was joined by 70 IT managers and 80 representatives of manufacturing enterprises and the business.

Work of Change Support Teams (CSTs)

The Russian nuclear industry has a tradition of supporting 'bottom-up' initiatives and thus enabling talented employees to fulfil themselves.

The CSTs comprise proactive employees who implement projects in order to drive changes. Participation in the CSTs not only enables them to put their ideas into practice, but also provides an informal channel for communicating directly with industry executives. In turn, this provides employees with new career opportunities and serves as an efficient tool for training new leaders at the local level. By the end of 2019, more than 100 teams had been formed; they comprise about 2,500 employees from different organizations.

8.1.5. EMPLOYEES' PARTICIPATION IN EXTERNAL AND INDUSTRY-WIDE PROFESSIONAL COMPETITIONS

LEADERS OF RUSSIA

Employees of Russian nuclear organizations actively participate in the Leaders of Russia national management competition. More than 1,500 employees took part in the second competition (in

2018/2019). 84 people reached the semi-finals, with 4 people progressing to the final. Winners included one of the Company's employees.

WORLDSKILLS

In the 45th WorldSkills International Competition, WorldSkills Kazan 2019, the team of the Russian nuclear industry won two gold medals and two Medallions for Excellence, while the participants of the Future Skills competition, which is focused on professions of the future, won another 11 medals.

133 contestants and 145 experts represented 27 skills across all sections of the competition (the national competition, WorldSkills Juniors and Skills of the Wise) and won 58 medals: 42 golds, 10 silvers and 6 bronzes.

In the WorldSkills Hi-Tech 2019 Competition (Ekaterinburg), which became the fifth national competition of cross-industry skilled professions for workers in high-technology industries held in accordance with the WorldSkills methodology, the industry team once again achieved impressive results.

More than 600 participants and over 600 experts representing more than 80 organizations and core universities took part in the AtomSkills industry-wide competition in 2019. A career guidance programme for school and university students titled 'Conquering the Arctic' was held as part of the competition; it was attended by more than 1,200 people.

8.1.6. ROSATOM'S PERSON OF THE YEAR

ROSATOM's Person of the Year is an industry-wide recognition programme whereby executives express their appreciation for the achievements of the best employees. Key selection criteria include major work achievements, the ability to think out of the box, commitment to corporate values, and professional competences of the candidates. 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 of ROSATOM. To support the launch of an industry-wide volunteer movement and contribution to the achievement of the UN Sustainable Development Goals, a new special category, Sustainable Development, was introduced in 2019.

Overall, a record-breaking 2,353 applications were submitted for the competition in 2019, and 300 finalists were selected.

8.1.7. CORPORATE VOLUNTEERING

Russian nuclear organizations continue to develop a large number of volunteering initiatives.

Key objectives of corporate volunteering include:

- Forming a pool of social leaders from among employees;
- Developing horizontal cooperation;
- Enhancing the image of JSC Atomenergoprom as a socially responsible company.

Code of Ethics

ROSATOM and JSC Atomenergoprom have adopted a Code of Ethics and Professional Conduct for Employees. The Code of Ethics promotes corporate values and establishes the relevant ethical principles of conduct in the course of interaction with a wide range of external and internal stakeholders. The rules of conduct set out in the Code concern combating corruption, ensuring the security of resources, property and information, occupational safety and health, industrial and environmental safety, preventing conflicts, resolving conflicts of interest and keeping up the corporate image.

The Code of Ethics is available on ROSATOM's official website (<https://rosatom.ru/sustainability/code-of-ethics/>).

The first volunteers' forum was held in 2019. It was attended by more than 70 representatives of nuclear organizations and more than 30 representatives of administrations of 'nuclear' towns and cities.

About 400 employees took part in a tree-planting campaign conducted in Nizhny Novgorod as part of an industry-wide Youth Congress.

The Company launched a campaign titled 'School Bag for a Friend' for children affected by a flood in the Irkutsk Region. As part of this initiative, more than 1,600 school bags filled with school supplies were donated to school students.

In the reporting year, representatives of the nuclear industry participated for the first time in the International Volunteer Forum in Sochi, which was attended by the Russian President. The industry delegation comprised more than 50 leaders of volunteer groups from 20 organizations.



8.1.8. EMPLOYEE ENGAGEMENT³⁵

According to the findings of a survey among 50,402 employees in 70 Russian nuclear organizations, in 2019, the employee engagement rate in the industry stood at 82%, on a par with the best employers in Russia.

The target for the next three to five years is to maintain the average employee engagement rate on a par with global leaders in high-technology industries (at least 77%) and to achieve this rate in most organizations that participate in the survey.

8.1.9. SOCIAL POLICY

JSC Atomenergoprom's social policy is designed to:

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

Employment benefits provided to employees and retirees comply with the Uniform Industry-Wide Social Policy, which is based on standardized corporate social programmes.

KEY CORPORATE SOCIAL PROGRAMMES OF JSC ATOMENERGOPROM, RUB million

	2017	2018	2019
Voluntary health insurance	1,123.1	1,180.8	1,454.2
Accident and illness insurance	49.2	51.1	52.5
Health resort treatment and recreation for employees and their children, including:	686.6	702.2	739.8
<i>health resort and rehabilitation treatment for employees</i>	524.8	523.4	600.1
<i>health resort treatment and recreation for children</i>	161.8	178.8	139.7
Provision of housing for employees	830.6	714.6	491.2
Private pension plans	354.1	359.4	269.2
Support for retirees	926.5	917.6	967.0
Catering arrangements	24.9	32.2	54.2
Sporting and cultural events	884.2	955.1	1,031.4
Assistance to employees	1,312.2	1,392.4	841.9
Other	536.5	558.8	—
Total:	6,727.9	6,864.2	5,901.5

³⁵ Engagement is an emotional and intellectual state encouraging employees to do their job to the best of their abilities. Employee engagement surveys have been conducted in the Russian nuclear industry since 2011 under the international methodology with assistance from an independent expert organization. The engagement rate is defined as the share of engaged employees as a percentage of the total number of respondents.

JSC Atomenergoprom adheres to the 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 Standardized Remuneration System, the Uniform Industry-Wide Social Policy and the Occupational Safety Management System.

The Agreement gives priority to the protection of employees' lives and health (see also the section 'Occupational Safety and Health'). Jointly with the Russian Trade Union of Nuclear Power and Industry Workers (RTUNPIW), employers maintain records of and analyse morbidity among employees, including based on records of periodic medical examinations and sick leave, and build an integrated health care programme titled Health. The Agreement incorporates the opportunities provided by legislation on the special inspection of working conditions (SIWC) and stipulates an additional mechanism for cooperating with the trade union in conducting an SIWC and analysing

Collective agreements in all of JSC Atomenergoprom's organizations provide for a minimum notice period of two months for significant operational changes, and of three months for situations that may lead to dismissals.

Collective agreements cover 85% of employees working in the Russian nuclear industry.

inspection findings. 55.7% of JSC Atomenergoprom's employees are RTUNPIW members.

2019 was declared the Year of Occupational Health and Safety and a Healthy Lifestyle in the Russian nuclear industry. The Company has introduced the practice of organizing health days, health screenings and detailed medical examinations for employees.

8.1.10. RECRUITMENT OF YOUNG PROFESSIONALS

JSC Atomenergoprom gives special focus 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 2019 had graduated from university with honours.

In 2019, a total of 731 students attended universities under arrangements with JSC Atomenergoprom.

The Company continued to organize work placements for students from specialized universities: in 2019, 2,624 students undertook internships in the organizations of JSC Atomenergoprom.

According to an industry forecast of demand for specialists who have received university education or secondary vocational education until 2030, JSC Atomenergoprom is expected to hire around 1,000 graduates of core universities per year on average, including around 410 graduates of NRNU MEPhI and its branches.

In 2019, JSC Atomenergoprom's organizations hired 828 graduates of core universities.

8.1.11. INTERNATIONAL COOPERATION IN EDUCATION

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

In 2019, more than 1,600 foreign students from Vietnam, Rwanda, Bolivia, Uzbekistan, Turkey, Bangladesh, Jordan, Egypt, Algeria, Nigeria, South Africa, Ghana and other countries studied at Russian universities. Another 275 students from 58 countries are due to enrol on courses in nuclear and related disciplines in 2020.

In order to promote the development of national nuclear education systems in partner countries, joint educational programmes are being implemented in cooperation with foreign universities in Egypt, Bolivia, Ghana, Turkey, Armenia, Kazakhstan and Rwanda. 131 students were enrolled for these joint programmes in 2019.

To train personnel for the nuclear industry of the Republic of Uzbekistan, in 2019, NRNU MEPhI opened its first overseas branch in Tashkent. Following a competitive examination, 100 candidates were enrolled on first-year courses.

8.1.12. PLANS FOR 2020 AND FOR THE MEDIUM TERM

- To enable rapid development of key business competences;
- To create a digital environment and promote employees' digital literacy;
- To train leaders at all levels;
- To develop a safety culture aligned with the Vision Zero paradigm (for details, see the section 'Occupational Safety and Health');

- To improve the quality of employees' lives and promote a healthy lifestyle;
- To continue to top the rankings of the best employers;
- To develop an online training system and increase the number of employees covered by training programmes.

8.2. DEVELOPING THE REGIONS OF OPERATION

JSC Atomenergoprom contributes to the social and economic development of its regions of operation in many ways. The Company contributes significantly to the energy security of a number of regions. JSC Atomenergoprom is a large taxpayer paying taxes to the budgets of all levels. The Company makes a substantial economic impact on the

regions of its operation by providing considerable employment opportunities to skilled professionals in the nuclear industry and related industries, thus improving overall employment in the regions and providing decent working conditions and remuneration.

8.2.1. ENSURING THE ENERGY SECURITY OF RUSSIAN REGIONS

Nuclear power generation contributes significantly to power systems across Russia. NPPs accounted for 19% of the total

electricity output (18.7% in 2018), while in European Russia the share of nuclear power generation exceeded 25%.

	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	PS of the East*
Nuclear power generation at JSC Rosenergoatom, billion kWh	208.78	208.6	96.31	30.00	38.60	33.89	9.78	0.21
Share of nuclear power generation, %**	19.0	25.2	40.8	27.2	34.2	32.9	3.7	0.41

* Including isolated systems.

** Data on power generation in Russia for 2019 according to a press release of the System Operator of the Unified Power System dated January 13, 2020 (available on the SO UPS website at www.so-ups.ru).

8.2.2. GENERATING EMPLOYMENT THROUGH NPP CONSTRUCTION

The construction and commissioning of nuclear facilities, including NPP power units, creates new jobs, as enterprises often recruit employees from local communities within a 100-kilometre radius of the construction site. For instance, as construction work progressed at the site of Rooppur NPP in Bangladesh in 2019, thousands of local residents gained employment. Importantly, these projects also create jobs in related sectors of the economy (the metals industry, mechanical engineering, etc.).

The construction of the Belarusian NPP has become a major infrastructure project providing employment to thousands of people, both at the NPP itself and in organizations that are servicing it. In 2019, more than 30 local contractors were involved in NPP construction.

EMPLOYMENT IN KEY NPP CONSTRUCTION PROJECTS (AT YEAR-END 2019)

NPP	Actual headcount, including contractors	Including employees recruited from local communities ³⁶
Leningrad NPP-2 (Russia)	3,416	3,249
Kursk NPP-2 (Russia)	4,566	4,566
Belarusian NPP	7,873	1,849
Rooppur NPP (Bangladesh)	8,850	7,454
Akkuyu NPP (Turkey)	5,643	4,435

8.2.3. URBAN INFRASTRUCTURE DEVELOPMENT

JSC Atomenergoprom is implementing the Smart City project in its regions of operation. This project forms part of the Housing and Urban Environment National Project and the Digital Economy National Programme; its aim is to make Russian towns and cities more competitive, develop an efficient system for the management of municipal services and create a safe and comfortable environment for local residents. The project has been implemented in Sarov (Nizhny Novgorod Region). Over the year and a half since the launch of the Smart City system, the amount of time required to process enquiries and complaints received from residents has been reduced four-fold; the amount of time required for public transport dispatch operations has been reduced from two and a half days to an hour and a half, while the time of response to accidents or utility service failures has been reduced from 30 to 3 minutes.

The Smart City is underpinned by the sustainable use of resources and the use of state-of-the-art digital technologies. Information obtained as a result of a thorough process analysis at the local level is digitized and provides a basis for a continuous improvement system.

The Smart City includes the Digital Water Supply and Sewerage System as one of its elements. This is a system for the automation and digitization of production and distribution processes which enables effective management of water supply and sewerage systems.

JSC Rusatom Infrastructure Solutions acts as the integrator of solutions in the following areas: Centralization of Municipal Utility Systems, Clean Water and the Smart City.

³⁶ Employees who are nationals of the country in which the NPP is being built.

In 2019, a number of cooperation agreements were signed with Russian regions. The agreements cover the following areas:

- Digitization of municipal services in order to improve transport and social infrastructure;
- Making the regions more attractive to investors; upgrading utility infrastructure using modern approaches based on digital technology.

8.3. STAKEHOLDER ENGAGEMENT

Key results in 2019:

- 73.7% of the population in Russia supports the use of nuclear energy.
- 335,000 people visited Nuclear Energy Information Centres.
- Viewership of channels broadcasting the *Strana ROSATOM* TV programme in various regions of Russia totals 7.3 million people.

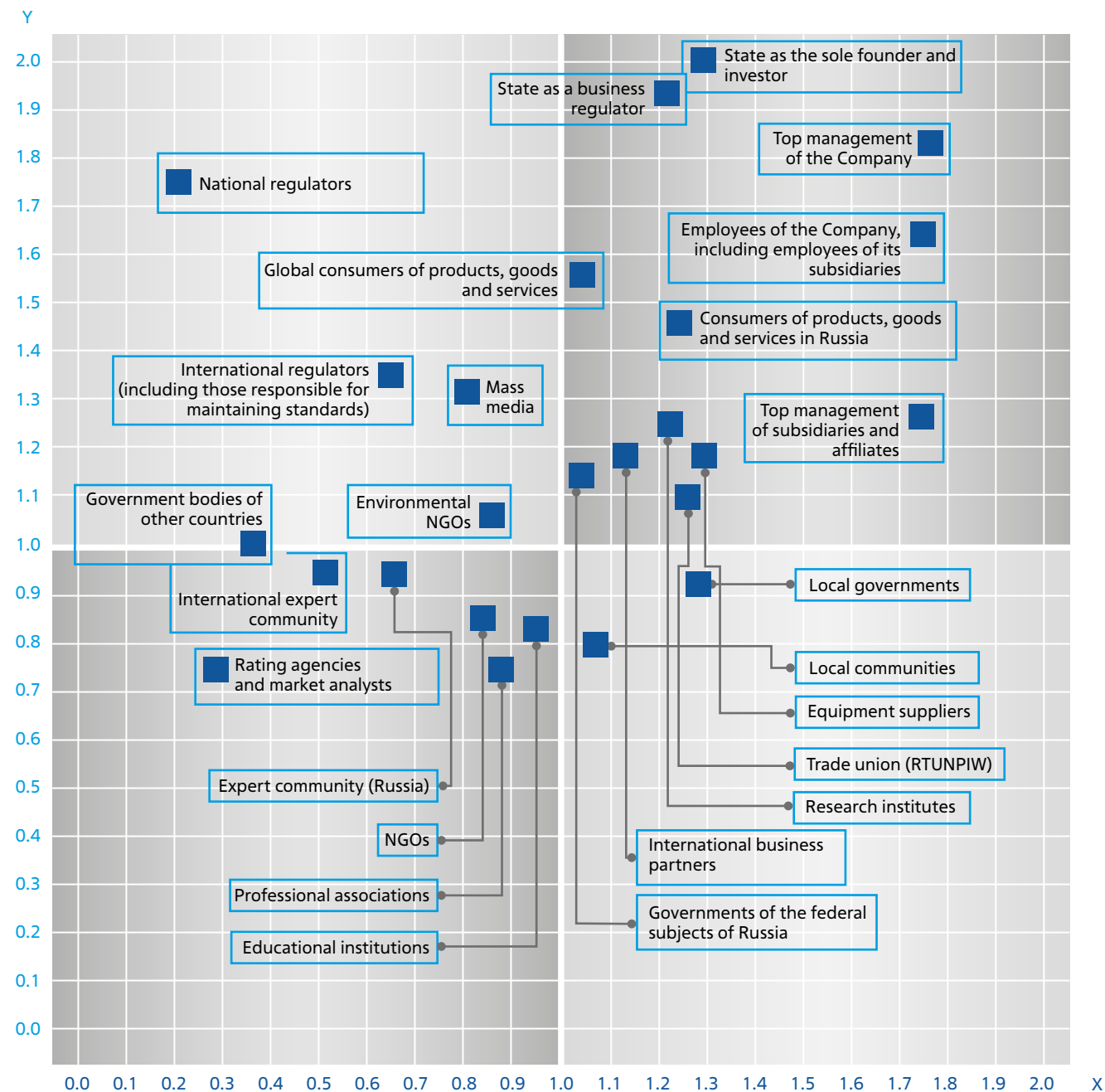
8.3.1. APPROACHES TO STAKEHOLDER ENGAGEMENT

Due to the scale and special characteristics of its business (simultaneous performance of state and business tasks, operation across a large number of markets), JSC Atomenergoprom has a wide range of stakeholders both in Russia and worldwide. Targeted stakeholder engagement is aimed at achieving strategic goals and getting the public on board for developing nuclear energy. The Company fosters systematic and constructive stakeholder engagement in each area of its business and communicates with society as a whole.

Fundamental principles of stakeholder engagement are as follows:

- Respect and accommodation of the interests of all participants;
- Open efficient cooperation;
- Timely and exhaustive information on the Company's activities;
- Striving to provide specific benefits to all participants;
- Fulfilment of obligations.

STAKEHOLDER MAP



X – impact of the Company on the stakeholder
Y – stakeholder's impact on the Company

8.3.2. NUCLEAR ENERGY INFORMATION CENTRES (NEICS)³⁷

Nuclear Kids (NucKids) (<http://www.nuckids.ru/en>) is an annual international art project for the children of employees of Russian nuclear organizations and the Company's foreign partners. The project is being implemented in 15 countries. Many NucKids alumni study at well-known universities, such as the Russian Institute of Theatre Arts (GITIS), the Moscow Art Theatre School, the Russian State University of Cinematography (VGIK) and the Oleg Tabakov Studio. They perform in films and work in show business.

In 2019, 57 children took part in the project. Under the supervision of professional choreographers, directors, voice coaches and singing teachers, they staged a play titled *In the Beginning Was the Word*, based on *Chuchelo* ('The Scarecrow'), a novella by Vladimir Zheleznikov. This frank and profound piece focused on the problem of teenage bullying and 'living online'. It was premiered in Debrecen (Hungary), followed by performances in Russian 'nuclear' towns of Sosnovy Bor (Leningrad Region) and Udomlya (Tver Region), as well as in Saint Petersburg and Moscow.

The objective of NEICs is to raise awareness among local communities in the regions about the nuclear industry and the development prospects 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.

As at December 31, 2019, the NEIC network comprised 17 centres in Russia, as well as centres in Minsk (Belarus) and Nur-Sultan (Kazakhstan). In 2019, 335,000 people visited the centres.

In 2019, almost every NEIC held a city-wide event. Vladimir and Zheleznogorsk (Krasnoyarsk Territory) hosted a mini science festival,

Scientific Encounters; an adventure game titled *Stark Is Alive!* was designed in Ulyanovsk and successfully replicated in Voronezh, Novovoronezh and Rostov-on-Don; residents of Minsk and Smolensk took part in a science and sporting event, *AtomDvizh* ('Atom-Move'). Centres in Ekaterinburg, Kaliningrad and Novosibirsk held the KSTATI ('By the Way') Festival of Science, which has become an annual event in these cities. Employees of the NEIC in Nizhny Novgorod organized a Science Tour in six districts in the northern part of the Nizhny Novgorod Region, while the NEIC in Saratov held a *Science Lawn* festival, which consisted of a 30-day non-stop series of workshops for children, popular science talk shows, musical performances and outdoor games. The NEIC in Belarus launched a special project, *Construction DNA*, as part of a town festival in Ostrovets and a programme titled *Sounds of a Construction Site* in Minsk.

8.3.3. ATOMEXPO INTERNATIONAL FORUM

ATOMEXPO is an event initiated by ROSATOM that serves as a global industry-wide discussion platform. Held annually since 2009, it is the largest exhibition and business platform for discussing the current state of the nuclear industry and setting future trends.

The 2019 Forum was titled 'Nuclear for Better Life'; its business agenda was focused on the contribution of state-of-the-art nuclear technology to the achievement of the UN Sustainable Development Goals.

The Forum was attended by more than 4,000 people from 74 countries and 40 official delegations, including 8 ministers and high-ranking officials holding equivalent positions. More than 40 cooperation agreements, memoranda and contracts, including 6 official interdepartmental agreements, were signed on the sidelines of the Forum.

The Russia – IAEA Nuclear Energy Management School was run at the ATOMEXPO venue. This event was attended by delegates representing 19 countries; they studied practices used in addressing matters related to various aspects of implementation of national nuclear power programmes.

³⁷ <http://www.myatom.ru>.

The ATOMEXPO AWARDS ceremony was held; this is an international professional award for outstanding achievements, which is presented to global industrial companies that have

made an important contribution to the development of the nuclear industry and the use of nuclear power for the benefit of humankind.

8.3.4. PROJECTS IN THE SPHERE OF COMMUNICATION AND THE HUMANITIES IMPLEMENTED IN COOPERATION WITH FOREIGN PARTNERS

In 2019, the Company organized 25 events in the field of the humanities in Russia and seven partner countries. As part of these events, foreigners learnt about Russia, the Russian culture and way of life. The events were attended by more than 2,000 people from 43 countries.

The Company provided support for community relations projects in the countries in which it operates (the Benois de la Danse World Ballet Festival, the Geographical Dictation, the FIDE World Chess Championship, etc.).

Four international shifts were organized as part of the International Smart Holidays project, with 94 children from the Company's partner countries participating in the project.

About 25 technical tours of nuclear facilities in Russia and construction sites of Russian-design NPPs abroad were organized for Russian and foreign journalists and experts (more than 200 people).

8.3.5. INDUSTRY MEDIA

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

- A newspaper (published weekly in all enterprises in the Russian nuclear industry, with a circulation of 59,000 copies and a readership of over 250,000 people);
- A radio programme (it is broadcast two or three times a week in 30 organizations and has an audience of 50,000 people);
- A television programme (it is aired weekly in 20 towns and cities where nuclear organizations operate; the viewership of the channels that broadcast the programme totals 7.3 million people).

8.3.6. OPINION POLLS

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

According to an independent opinion survey by Levada-Centre³⁸, 73.7% of the Russian population supported the use of nuclear power (74.5% in 2018). Over the past few years, this figure remains persistently high.

³⁸ The survey was conducted from February 14 through February 28, 2020 across a representative sample of Russian citizens consisting of 3,951 people aged 18 and above.

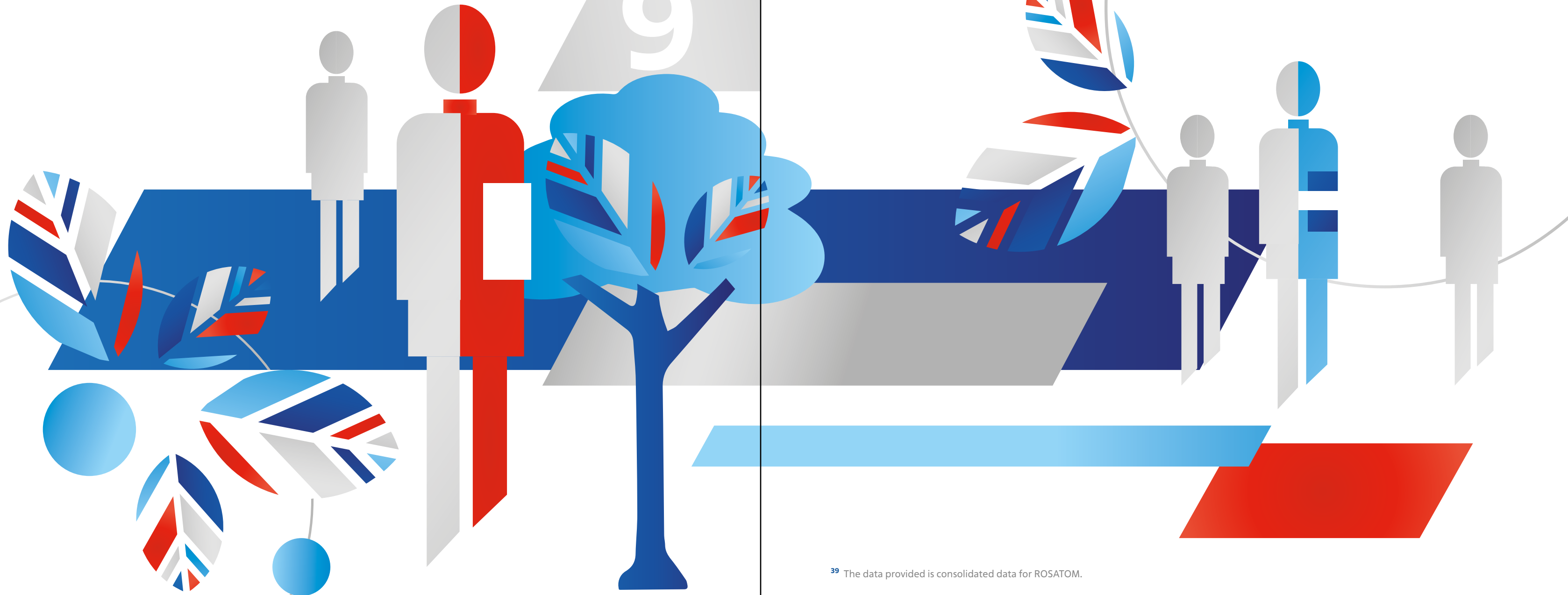
– DO YOU THINK THAT THE NUCLEAR POWER INDUSTRY SHOULD BE ACTIVELY DEVELOPED, MAINTAINED AT ITS CURRENT LEVEL, CURTAILED OR TOTALLY ABANDONED?

Actively developed	46.9%
Maintained at the current level	26.8%
Curtailed	7.7%
Totally abandoned	9.4%
I do not know	9.2%

– DO YOU AGREE WITH THE FOLLOWING STATEMENT: 'NUCLEAR ENERGY IS A "GREEN", ENVIRONMENTALLY FRIENDLY TYPE OF POWER GENERATION'?

I completely agree	17.7%
I partly agree	36.5%
I partly disagree	22.7%
I completely disagree	14%
I do not know	9.1%

SAFE OPERATION³⁹



³⁹ The data provided is consolidated data for ROSATOM.

9.1. NUCLEAR AND RADIATION SAFETY; OCCUPATIONAL SAFETY AND HEALTH

Key results in 2019:

- No events rated at level 1 or higher on the INES scale were detected.
- The injury frequency rate and the lost time injury frequency rate (LTIFR) stood at 0.22 and 0.1 respectively.

9.1.1. NUCLEAR AND RADIATION SAFETY AT NUCLEAR FACILITIES

In 2019, JSC Atomenergoprom ensured safe and steady operation of enterprises in the nuclear industry. There were no incidents involving radiation leaks. Limits on employee radiation exposure were not exceeded. No licences were revoked in the nuclear industry.

As in many recent years, in 2019, no events rated at level 2 or higher on the international INES scale were detected at Russian nuclear power plants. Moreover, in 2019, there were no events rated at level 1. Deviations detected at NPPs (rated at level 0) do not pose a risk to employees operating the facilities, local residents or the environment.

9.1.2. PHYSICAL PROTECTION OF NUCLEAR FACILITIES

The security and physical protection of Russian nuclear facilities posing nuclear and radiation hazards and of nuclear and radioactive materials used and stored there (including during their transportation) complies with Russian legislation

and the provisions of the Convention on the Physical Protection of Nuclear Material and is consistent with the IAEA recommendations.

9.1.3. INDUSTRY-WIDE RADIATION MONITORING SYSTEM

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

In 2019, the IRMS included:

- 435 fixed on-site ARMS stations;
- 2,695 on-site subsoil condition monitoring (OSCM) wells;
- 206 air quality monitoring stations;

- 176 atmospheric precipitation monitoring stations;
- 455 stations monitoring surface water bodies;
- 213 stations monitoring bottom sediments;
- 561 soil monitoring stations;
- 404 ground vegetation monitoring stations;
- 92 stations monitoring algae and aquatic organisms;
- 397 stations monitoring the snow cover;
- 290 stations monitoring food products;
- 432 absorbed dose monitoring stations.

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

9.1.4. OCCUPATIONAL SAFETY AND HEALTH

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 organizations (first and foremost, the Single Industry-Wide Policy on Occupational Safety and Health) are designed to prevent workplace accidents and occupational diseases, facilitate systematic monitoring of working conditions and occupational safety and health performance and support occupational safety and health not only in the Company, but also in contractor and subcontractor organizations engaged in the operation of nuclear facilities.

In 2019, the Russian nuclear industry joined the Vision Zero⁴⁰ international campaign in order to achieve a zero injury rate in its organizations.

In 2019, the injury frequency rate across the Russian nuclear industry remained relatively low compared to major Russian companies. The injury frequency rate (FR) stood at 0.22, which is more than five times lower than the national average (FR = 1.2).

In addition to the FR injury frequency rate, the Company also uses the lost time injury frequency rate (LTIFR), which enables it to benchmark the injury rate against that of other companies and countries. In 2019, the LTIFR across the Russian nuclear industry stood at 0.1.

9.1.5. RADIATION EXPOSURE OF EMPLOYEES

The criteria of employee radiation safety are laid down in the Radiation Safety Standards (NRB-99/2009), the Basic Sanitary Rules of Radiation Safety (OSPORB-99/2010) and other regulations. Russian nuclear organizations provide workplace conditions that fully comply with the requirements set out in these documents.

In 2019, the average annual effective radiation dose of the Company's personnel totalled 1.59 mSv. In 2019, employee radiation exposure did not exceed regulatory limits. The total effective dose for any employee did not exceed 100 mSv over five consecutive years. The annual dose limit of 50 mSv was not exceeded. Over the past nine years, average effective employee radiation exposure and the number of people exposed to radiation have been varying insignificantly and remain low.

In 2019, the Company continued to monitor radiation risks for group A personnel using the IRAW occupational radiation risk assessment system. Individual risk was calculated for 64,932 people, or 99.8% of the total number of group A employees. The absolute majority of group A employees work in the conditions of acceptable occupational risk. Over the last three years, the average individual radiation risk across the Russian nuclear industry did not exceed 7% of the regulatory limit, while the maximum individual risk has been decreasing steadily.

⁴⁰ Vision Zero is based on the belief that all accidents, diseases and harm at work are preventable and on the commitment of Vision Zero Companies and Partners to promote the three core values of this campaign: Safety, Health and Well-Being (<http://visionzero.global/ru>).

9.2. ENVIRONMENTAL SAFETY

9.2.1. ENVIRONMENTAL SAFETY AND ENVIRONMENTAL PROTECTION MANAGEMENT

The environmental footprint of the nuclear power industry is substantially smaller than that of carbon-based power generation using fossil fuel. Emissions of hazardous chemicals, including those that destroy the ozone layer or contribute to the greenhouse effect, from nuclear power plants are close to zero.

JSC Atomenergoprom and its enterprises 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;
- Transparency and making information on environmental aspects of the enterprises' operations publicly available.

The goals and initiatives of ROSATOM and JSC Atomenergoprom in the sphere of environmental safety and environmental

protection are stipulated in the Uniform Sectoral Environmental Policy⁴¹.

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 2019–2021, which stipulates organizational, operational and technical measures to be implemented by organizations in the Russian nuclear industry.

To improve environmental safety and the efficiency of environmental protection measures, organizations that make a considerable impact on the environment are implementing environmental management, quality management, occupational health and safety management and energy management systems.

9.2.2. GREENHOUSE GAS EMISSIONS

Climate change is recognized as one of the biggest problems facing the international community, businesses and citizens. The Russian Government has ratified the Paris Agreement, whereby the participating countries take on a commitment to reduce greenhouse gas emissions.

A greenhouse gas emissions accounting system is being created in the Russian nuclear industry in order to fulfil international legal commitments of the Russian Federation on climate and mitigate risks associated with the operations of ROSATOM

and its enterprises. In 2019, a framework high-level document in this area was developed and approved: the Regulation on a System for Accounting for Greenhouse Gas Emissions Generated by Russian Nuclear Organizations. Plans for 2020 include developing uniform industry-wide methodological guidelines on greenhouse gas emissions accounting for nuclear enterprises.

In 2019, gross greenhouse gas emissions totalled 5,770.36 tonnes, which is 6.4% lower than in 2018.

⁴¹ <https://www.rosatom.ru/upload/iblock/74e/74eb9c650aa73e74d0b9b9aadea0c1f8.pdf>.

9.2.3. IMPROVED ENERGY EFFICIENCY

Energy conservation is an important prerequisite for the efficient use of JSC Atomenergoprom's energy resources, making it more competitive and reducing its negative environmental impact. An energy conservation and energy efficiency improvement programme for the period from 2018 through 2022 is being implemented in the Russian nuclear industry.

The Company's enterprises have implemented most elements of an energy management system compliant with the international ISO 50001 standard.

In 2019, the cumulative total reduction in energy consumption in the Russian nuclear industry against 2015 as the base year under comparable conditions amounted to 9.7%.

ENERGY COST REDUCTION IN 2019

Division	Cumulative total compared to 2015, %
Power Engineering Division	4.78
Fuel Division	13.45
Mining Division	10.95
Mechanical Engineering Division	20.55
Engineering Division	20.57



GLOSSARY

BOO (Build – Own – Operate) contract	a contract imposing obligations related to the construction, ownership and operation of a facility
Capacity factor	the ratio of actual electricity output of a reactor unit during its operation to electricity output that would have been produced during its operation at full nameplate capacity without shutdowns
Closed nuclear fuel cycle	a nuclear fuel cycle in which spent nuclear fuel is processed in order to extract uranium and plutonium for nuclear fuel refabrication
Corporate business model	a model comprising key business processes and resources (types of capital) used by the organization to create and maintain its value in the long term
Corporate social responsibility	a concept whereby an organization takes into account stakeholder requests. It is a set of obligations voluntarily assumed by the organization's executives to take into account the interests of employees, shareholders, local communities in the organization's operating regions, government bodies and municipal governments and other stakeholders. These obligations are funded mainly from the organization's own funds and are aimed at implementing significant internal and external social (in a broad sense) programmes whose outcomes help develop the organization, improve its reputation and image, and enable constructive stakeholder engagement
Depleted uranium	uranium with a lower content of the U-235 isotope than natural uranium (e.g. uranium in spent fuel from reactors fuelled with natural uranium)
Dialogue with stakeholders (as part of preparation of the annual report)	an event held in accordance with the international AA1000 standards to facilitate communication between the organization and representatives of key stakeholders when preparing its annual report in order to improve the organization's transparency and accountability
Digitization	a systematic approach to the use of digital resources in order to improve labour productivity, gain a competitive advantage and promote overall economic development
Enrichment (isotopic)	a) the amount of atoms of a specific isotope in a mixture of isotopes of the same element if it exceeds the share of this isotope in a naturally occurring mixture (expressed as a percentage); b) a process resulting in an increase in the content of a specific isotope in a mixture of isotopes
EPC (Engineering – Procurement – Construction) contract	a contract imposing obligations related to the turnkey construction of a facility, i.e. obligations related to the engineering, procurement and construction of a facility. Unlike a BOO contract, it does not provide for ownership of the facility to be built

EPCM (Engineering – Procurement – Construction – Management) contract	a contract imposing obligations related to the turnkey construction (engineering, procurement and construction) and management of a facility. Unlike a BOO contract, it does not provide for ownership of the facility to be built
Fast neutrons	neutrons whose kinetic energy exceeds a certain limit. This limit varies within a broad range and depends on the application (reactor physics, protection or radiation monitoring). In reactor physics, this limit is usually set at 0.1 MeV
First criticality	a stage in the commissioning of an NPP which involves loading nuclear fuel into the reactor, achieving first criticality and performing required physical experiments at a power level at which heat is removed from the reactor through natural heat losses
Fuel assembly	a set of fuel elements (rods, bars, plates, etc.) held together with spacer grids and other structural elements that are transported and irradiated in the reactor in one piece. Fuel assemblies are loaded into the reactor core
Global Reporting Initiative (GRI)	an international system for reporting on economic, environmental and social performance based on the Sustainability Reporting Standards, Technical Protocols and Sector Supplements
Global Reporting Initiative (GRI) Sustainability Reporting Standards	Standards establishing principles that determine report content and the quality of reporting information, outline standard disclosures (performance indicators related to an organization's economic, environmental and social impacts, approaches to managing these impacts and other characteristics), and recommendations regarding specific technical aspects of reporting
Integrated report	a report consolidating all material data on the organization's strategy, corporate governance, performance indicators and prospects to provide a comprehensive picture of its economic, social and environmental status. The report gives a clear and precise idea of stewardship and value creation in the organization at present and in the future
International Integrated Reporting Council (IIRC)	an international organization responsible for the development of global integrated reporting standards that make it possible to present managerial, financial, social, environmental and other information in a clear, concise, consistent and comparable report. The objective of the IIRC is to develop universal approaches to providing corporate reports in order to promote sustainable development of the global economy
Key performance indicators (KPIs)	key performance indicators consistent with the goals of JSC Atomenergoprom and reflecting the efficiency and performance of organizations (and operations of divisions) and the individual performance of employees
Non-financial reporting	reports provided by an organization on its performance beyond its core operational and financial activities (and the management of this performance). Examples of non-financial reports include sustainability reports, corporate social responsibility reports, environmental reports, reports on philanthropy, etc.
NPP safety	the ability of an NPP to ensure radiation safety for personnel, the general public and the environment within required limits during normal operation and in the event of an accident
Nuclear fuel	material containing fissionable nuclides which, after being placed in a nuclear reactor, enables a nuclear chain reaction

Nuclear fuel cycle	a sequence of manufacturing processes aimed at ensuring the operation of nuclear reactors, ranging from uranium production to radioactive waste disposal
Nuclear power	a branch of power engineering that uses nuclear energy for electricity and heat generation
Nuclear safety	the ability of nuclear facilities (including NPPs) to prevent nuclear accidents and radioactive leaks
Operator	an organization that has obtained a permit from a regulator for the operation of an NPP or another nuclear facility
Phase Gate approach	an approach to planning and carrying out investment activities which involves breaking down investment projects into phases, each of which is preceded by a Gate Review of achieved results, as well as plans and risks related to further project implementation, and the decision is made on whether to proceed to the next phase of project implementation
Power start-up	a stage in the commissioning of an NPP at which the NPP starts to generate energy, and the operation of the NPP is tested at various power levels, up to the level specified for commercial operation
Radiation burden	the sum of individual doses of radiation received or planned in the course of operation, maintenance, repairs, replacement or dismantling of equipment at a nuclear facility (e.g. an NPP)
Radiation safety	protection of the current and future generations and the environment against the harmful impact of ionizing radiation
Radioactive discharge	controlled release of radionuclides into industrial reservoirs as a result of the operation of a nuclear facility (e.g. an NPP)
Radioactive release	controlled atmospheric emission of radionuclides by a nuclear facility (e.g. an NPP)
Radioactive waste	materials and substances unsuitable for further use, as well as equipment and products with a radionuclide content above prescribed levels
Radioactive waste processing and conditioning	process operations aimed at ensuring that the physical form and condition of radioactive waste are appropriate for its disposal

Recommendations of the Russian Union of Industrialists and Entrepreneurs (RSPP) for Use in Governance Practice and Corporate Non-Financial Reporting (basic performance indicators)	a system of economic, social and environmental performance indicators for non-financial reports developed by the RSPP in order to facilitate the adoption of responsible business principles. It is based on a number of framework documents developed by UN organizations (including the UN Global Compact) and the Global Reporting Initiative, as well as methodological and procedural guidelines of the Federal State Statistics Service of the Russian Federation and guidelines developed by the RSPP (the Social Charter of Russian Business, Recommendations on the Preparation of Non-Financial Reports 'Five Steps Towards Social Sustainability of Companies', etc.)
Research reactor	a nuclear reactor designed for use as an object of research to obtain data on reactor physics and technology required in order to design and develop similar reactors or components thereof
Separative work unit (SWU)	a measure of efforts expended on the separation of a given amount of material with a specific isotopic composition into two fractions with different isotopic compositions; it does not depend on the separation process being used. Separative work is measured in kilograms, and enrichment and energy costs are calculated per kilogram of separative work performed
Stakeholders	individuals and/or legal entities and groups of individuals or entities that make an impact on the organization's operations through their actions and/or are affected by the organization. An organization may have different stakeholders (national and international regulatory (supervisory) authorities, shareholders, consumers of goods and services, business partners, suppliers and contractors, civil society organizations, local communities, trade unions, etc.) with differing and conflicting interests
Sustainable development	development meeting the needs of the present without compromising the ability of future generations to meet their own needs. Accordingly, an organization's transparency and accountability with regard to its economic, environmental and social impacts are fundamental requirements for every business entity
Sustainable Development Goals	17 interdependent goals set in the 2030 Agenda for Sustainable Development adopted by 193 countries at the session of the UN General Assembly in 2015. The goals include eradicating poverty in all its forms, reducing inequality and addressing climate change
Uranium conversion	a chemical engineering process involving the transformation of uranium-containing materials into uranium hexafluoride
Uranium hexafluoride	a chemical compound of uranium and fluorine (UF_6), which is the only highly volatile uranium compound (when heated to 53°C, uranium hexafluoride changes directly from the solid state into the gaseous state); it is used as feedstock for the separation of uranium-238 and uranium-235 isotopes using gaseous diffusion or the gas centrifuge method and for production of enriched uranium
Uranium ore enrichment	a combination of processes for primary treatment of uranium-containing mineral resources in order to separate uranium from other minerals contained in the ore. The composition of minerals does not change in the process; they are only separated mechanically, with ore concentrate being produced
Water-cooled water-moderated power reactor (VVER)	a water-cooled water-moderated power reactor in which water is used as both a coolant and moderator. Russian NPPs typically use two versions of VVER reactors: VVER-440 and VVER-1000

LIST OF ABBREVIATIONS

APCS	automated process control system
ARMS	automated radiation monitoring system
CATF	closed administrative and territorial formation
CIS	Commonwealth of Independent States
CNFC	closed nuclear fuel cycle
CRMS	corporate risk management system
EUP	enriched uranium product
EurAsEC	Eurasian Economic Community
FTP	federal target programme
HEU	highly enriched uranium
HLW	high-level waste
IAEA	International Atomic Energy Agency
IEPRS	a functional subsystem for emergency prevention and response in organizations within the jurisdiction of JSC Atomenergoprom
IGA	intergovernmental agreement
IIDMS	integrated industry-wide document management system
INES	International Nuclear Event Scale
IP	intellectual property
IRAW	individual risk assessment workstation
IRG	inert radioactive gases
ISRS	Integrated Standardized Remuneration System
ISS	inspection and search system
ITER	International Thermonuclear Experimental Reactor
IUEC	International Uranium Enrichment Centre
JSC	joint-stock company

JV	joint venture
KPI	key performance indicator
LC	life cycle
LEU	low-enriched uranium
LLC	limited liability company
LRW	liquid radioactive waste
MSSC	multipurpose shared services centre
NF	nuclear facility
NFA	nuclear fuel assembly
NFC	nuclear fuel cycle
NFE	nuclear fuel element
NPP	nuclear power plant
NRS	nuclear and radiation safety
OECD NEA	Nuclear Energy Agency of the Organization for Economic Cooperation and Development
R&D	research and development
RAW	radioactive waste
RBMK	high-power channel-type reactor
ROSATOM, Corporation	State Atomic Energy Corporation Rosatom
Rostekhnadzor	Federal Service for Environmental, Technological and Nuclear Supervision
RR	research reactor
RSPP	Russian Union of Industrialists and Entrepreneurs
Russia	Russian Federation
SNF	spent nuclear fuel
SWU	separative work unit
UN	United Nations

APPENDICES

APPENDIX 1. USE OF THE GRI SUSTAINABILITY REPORTING STANDARDS

GRI Standard used by the Company ⁴²	Section of the Report in which the Standard is used / comment
Disclosures from Standard GRI 102: General Disclosures	
102-1 Name of the organization	Company Profile
102-2 Activities, brands, products, and services	JSC Atomenergoprom Today
102-3 Location of headquarters	Company Profile
102-4 Location of operations	3.2. International Cooperation 3.3. International Business
102-5 Ownership and legal form	Company Profile
102-6 Markets served	3.1. Markets Served by Atomenergoprom 3.3. International Business
102-7 Scale of the organization	JSC Atomenergoprom Today Financial and Economic Results
102-8 Information on employees and other workers	8.1. Personnel Management
102-10 Significant changes to the organization and its supply chain	7.1. Corporate Governance
102-11 Precautionary Principle or approach	9.1. Nuclear and Radiation Safety; Occupational Safety and Health
102-14 Statement from senior decision-maker	Message from the Management
102-15 Key impacts, risks, and opportunities	2.1. Business Strategy until 2030 7.2. Risk Management 3.1. Markets Served by Atomenergoprom
102-16 Values, principles, standards, and norms of behaviour	8.1. Personnel Management
102-19 Delegating authority	7.1. Corporate Governance
102-22 Composition of the highest governance body and its committees	7.1. Corporate Governance
102-23 Chair of the highest governance body	7.1. Corporate Governance
102-35 Remuneration policies	7.1. Corporate Governance 8.1. Personnel Management
102-40 List of stakeholder groups	8.3. Stakeholder Engagement

⁴² The Company uses the 2016 version of the GRI Standards.

GRI Standard used by the Company	Section of the Report in which the Standard is used / comment
Disclosures from Standard GRI 102: General Disclosures	
102-42 Identifying and selecting stakeholders	8.3. Stakeholder Engagement
102-43 Approach to stakeholder engagement	8.3. Stakeholder Engagement
102-45 Entities included in the consolidated financial statements	History of JSC Atomenergoprom
102-48 Restatements of information	There were no restatements in the 2019 Report
102-49 Changes in reporting	In the reporting year, no significant changes were introduced compared to the previous reporting periods
102-50 Reporting period	Report Profile
102-51 Date of most recent report	Report Profile
102-52 Reporting cycle	Report Profile
102-53 Contact point for questions regarding the report	Contact Details
102-55 GRI content index	Appendix 1. Use of the GRI Sustainability Reporting Standards
Disclosures from Standard GRI 103: Management Approach	
103-1 Explanation of the material topic and its Boundary	Report Profile
103-2 The management approach and its components	See the sections of the Report corresponding to disclosures from topic-specific Standards
103-3 Evaluation of the management approach	
Disclosures from topic-specific GRI Standards	
Disclosure 203-2 from Standard 203: Indirect Economic Impacts	8.2. Developing the Regions of Operation
Disclosure 401-2 from Standard 401: Employment	8.1. Personnel Management ⁴³
Disclosure 402-1 from Standard 402: Labour/Management Relations	8.1. Personnel Management
Disclosure 403-2 from Standard 403: Occupational Health and Safety	9.1. Nuclear and Radiation Safety; Occupational Safety and Health
Disclosure 404-1 from Standard 404: Training and Education	8.1. Personnel Management
Disclosure 404-2 from Standard 404: Training and Education	8.1. Personnel Management
Disclosure 404-3 from Standard 404: Training and Education	8.1. Personnel Management
Disclosure 416-1 from Standard 416: Customer Health and Safety	7.2. Risk Management 9.1. Nuclear and Radiation Safety; Occupational Safety and Health
Disclosure 302-4 from Standard 302: Energy	9.2. Environmental Safety

⁴³ Benefits specified in section 8.1.9. 'Social Policy' are not provided to part-time employees.

APPENDIX 2. SUMMARY CONSOLIDATED FINANCIAL STATEMENTS OF JSC ATOMENERGOPROM BASED ON CONSOLIDATED FINAN- CIAL STATEMENTS FOR THE YEAR ENDED DECEMBER 31, 2019, AND THE INDEPENDENT AUDITORS' REPORT



**Joint Stock Company Atomic Energy Power
Corporation**

**Summary (consolidated) financial statements
for the year ended 31 December 2019
and Independent Auditors' Report**



Independent Auditors' Report on the Summary (Consolidated) Financial Statements

**To the Shareholders and the Board of Directors JSC
"Atomenergoprom"**

Opinion

The summary (consolidated) financial statements, which comprise the summary (consolidated) statement of financial position as at 31 December 2019, the summary (consolidated) statements of profit and loss, other comprehensive income, changes in equity and cash flows for the year then ended, and a related note, are derived from the audited consolidated financial statements of JSC "Atomenergoprom" ("the Company") and its subsidiaries (the "Group") for the year ended 31 December 2019.

In our opinion, the accompanying summary (consolidated) financial statements are consistent, in all material respects, with the audited consolidated financial statements, on the basis described in Note 1.

Summary (Consolidated) Financial Statements

The summary (consolidated) financial statements do not contain all the disclosures required by International Financial Reporting Standards. Reading the summary (consolidated) financial statements and our report thereon, therefore, is not a substitute for reading the audited consolidated financial statements and our report thereon.

The Audited Consolidated Financial Statements and Our Report Thereon

We expressed an unmodified audit opinion on the audited consolidated financial statements in our report dated 10 April 2020. That report also includes the communication of key audit matters.

Audited entity: JSC Atomic Energy Corporation (JSC "Atomenergoprom").
Registration No. in the Unified State Register of Legal Entities 1077758081664.
Moscow, Russia

Independent auditor: JSC "KPMG", a company incorporated under the Laws of the Russian Federation, a member firm of the KPMG network of independent member firms affiliated with KPMG International Cooperative ("KPMG International"), a Swiss entity.

Registration No. in the Unified State Register of Legal Entities 1027700125628.

Member of the Self-regulatory Organization of Auditors Association "Sodruzhestvo" (SRO AAS). The Principal Registration Number of the Entry in the Register of Auditors and Audit Organisations: No. 12006020351.



Management's Responsibility for the Summary (Consolidated) Financial Statements

Management is responsible for the preparation of the summary (consolidated) financial statements on the basis described in Note 1.

Auditors' Responsibility

Our responsibility is to express an opinion on whether the summary (consolidated) financial statements are consistent, in all material respects, with the audited consolidated financial statements based on our procedures, which were conducted in accordance with International Standard on Auditing (ISA) 810 "Engagements to Report on Summary Financial Statements".


Altukhov K.V.
JSC "KPMG"
Moscow, Russia

10 April 2020



Joint Stock Company Atomic Energy Power Corporation
Summary (consolidated) statement of financial position as at 31 December 2019
(in millions of Russian roubles)

		31 December 2019	31 December 2018 (restated*)
	Notes		
Assets			
Non-current assets			
Goodwill	16	38 400	42 826
Property, plant and equipment	15	1 890 433	1 758 160
Intangible assets	16	157 601	182 223
Investments in equity accounted investees	8	54 924	25 868
Financial assets measured at fair value through other comprehensive income	17a	41 578	80 228
Financial assets measured at fair value through profit or loss	17b	8 795	14 282
Contract assets, trade and other receivables	22	68 191	65 515
Non-current loans given	23	71 806	74 772
Non-current bank deposits	18	51 766	-
Deferred tax assets	19	17 605	14 925
Other non-current assets	20	102 729	101 655
Total non-current assets		2 503 828	2 360 454
Current assets			
Inventories	21	188 625	149 924
Income tax receivable		1 989	3 857
Other taxes receivable		1 136	1 665
Current bank deposits	18	33 565	16 624
Contract assets, trade and other receivables	22	305 432	243 198
Current loans given	23	14 351	19 494
Cash and cash equivalents	24	261 110	371 984
Financial assets measured at fair value through other comprehensive income	17a	85 948	26 794
Financial assets measured at fair value through profit or loss	17b	4 975	-
Other current assets		2 435	2 160
Total current assets		899 566	835 700
Total assets		3 403 394	3 196 154

*Restated for the effect of a common control transaction (see Note 1).

Joint Stock Company Atomic Energy Power Corporation
Summary (consolidated) statement of financial position as at 31 December 2019
(in millions of Russian roubles)

	31 December 2019	31 December 2018 (restated*)
EQUITY AND LIABILITIES		
Equity		
Share capital	1 035 873	1 035 873
Share premium	361	361
Reserves	13 509	34 017
Retained earnings	976 795	873 300
Total equity attributable to owners of the Company	2 026 538	1 943 551
Non-controlling interests	345 734	330 841
Total equity	2 372 272	2 274 392
Non-current liabilities		
Loans and borrowings	63 854	122 790
Contract liabilities, trade and other payables	213 899	231 020
Grants and other financing	14 747	11 403
Employee benefits	15 594	12 366
Provisions	233 388	140 503
Deferred tax liabilities	48 291	58 244
Pension liabilities	18 559	16 158
Total non-current liabilities	608 332	592 484
Current liabilities		
Loans and borrowings	78 429	66 293
Income tax payable	4 351	2 284
Other taxes payable	29 704	22 460
Contract liabilities, trade and other payables	295 846	224 357
Grants and other financing	4 623	4 200
Provisions	9 837	9 684
Total current liabilities	422 790	329 278
Total liabilities	1 031 122	921 762
Total equity and liabilities	3 403 394	3 196 154

Director
Chief Accountant
«10» April 2020



K.B. Komarov
V.A. Andrienko

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*Restated for the effect of a common control transaction (see Note 1).

Joint Stock Company Atomic Energy Power Corporation
Summary consolidated statement of profit and loss for the year ended 31 December 2019
(in millions of Russian roubles)

	2019	2018 (restated*)
Revenue	886 787	788 097
Cost of sales	(548 017)	(496 383)
Gross profit	338 770	291 714
Distribution expenses	(14 946)	(17 876)
Administrative expenses	(78 834)	(68 346)
Other income	19 184	29 360
Other expenses	(56 507)	(48 762)
Results from operating activities	207 667	186 090
Finance income	32 506	62 788
Finance costs	(53 822)	(38 206)
Share of net profit of equity accounted investees	506	766
Gain from change in accounting approach of joint ventures	-	46 940
Profit before income tax	186 857	258 378
Income tax expense	(46 461)	(48 221)
Profit for the year	140 396	210 157
Profit for the year attributable to:		
Owners of the Company	120 786	198 677
Non-controlling interests	19 610	11 480

Director
Chief Accountant
«10» April 2020



K.B. Komarov
V.A. Andrienko

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*Restated for the effect of a common control transaction (see Note 1).

Joint Stock Company Atomic Energy Power Corporation
 Summary (consolidated) statement of comprehensive income for the year ended 31 December 2019
 (in millions of Russian roubles)

	2019	2018 (restated*)
Profit for the year	140 396	210 157
Other comprehensive (loss)/income		
Items that will never be reclassified to profit or loss		
Remeasurement of defined benefit liability	(2 451)	1 086
Income tax on other comprehensive income	490	(217)
Pension liabilities provision	87	743
Total	(1 874)	1 612
Items that may be reclassified subsequently to profit or loss		
Net change in fair value of financial assets measured at fair value	(9)	(562)
Hedging reserve	451	87
Foreign currency translation differences	(25 560)	16 036
Reclassification of foreign currency translation differences to statement of profit and loss	-	4 214
Income tax on other comprehensive income	2	112
Total	(25 116)	19 887
Total other comprehensive (loss)/income	(26 990)	21 499
Total comprehensive income for the year	113 406	231 656
Total comprehensive income for the year attributable to:		
Owners of the Company	100 240	212 823
Non-controlling interests	13 166	18 833

Director
 Chief Accountant
 «10» april 2020



K.B. Komarov
 V.A. Andrienko

*Restated for the effect of a common control transaction (see Note 1).

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Joint Stock Company Atomic Energy Power Corporation
 Summary (consolidated) statement of changes in equity for the year ended 31 December 2019
 (in millions of Russian roubles)

	Equity								
	Attributable to equity holders of the Company								
	Share capital	Share premium	Fair value reserve for financial assets measured at fair value	Foreign currency translation reserve	Other reserves	Retained earnings	Total	Non-controlling interests	Total equity
Balance at 1 January 2018	1 035 873	361	892	17 533	1 056	706 863	1 762 578	280 156	2 042 734
Effect of common control transactions and business combination transactions	-	-	-	-	67	(548)	(481)	3 031	2 550
Balance at 1 January 2018 (restated*)	1 035 873	361	892	17 533	1 123	706 315	1 762 097	283 187	2 045 284
Total comprehensive income for the year	-	-	-	-	-	198 677	198 677	11 480	210 157
Profit for the year	-	-	-	-	-	-	-	-	-
Other comprehensive income	-	-	-	-	-	-	-	-	-
Foreign currency translation differences	-	-	-	13 220	-	-	13 220	7 030	20 250
Net change in fair value financial assets measured at fair value	-	-	(562)	-	-	-	(562)	-	(562)
Remeasurements of defined benefit liability	-	-	-	-	1 086	-	1 086	-	1 086
Hedging reserve	-	-	-	-	87	-	87	-	87
Pension liabilities provision	-	-	-	-	743	(323)	420	323	743
Income tax on other comprehensive income	-	-	112	-	(217)	-	(105)	-	(105)
Other comprehensive income	-	-	(450)	13 220	1 699	(323)	14 146	7 353	21 499
Total comprehensive income for the year	-	-	(450)	13 220	1 699	198 354	212 823	18 833	231 656

* Restated for the effect of a common control transaction (see Note 1).

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Joint Stock Company Atomic Energy Power Corporation
 Summary (consolidated) statement of changes in equity for the year ended 31 December 2019
 (in millions of Russian roubles)

	Equity							
	Attributable to equity holders of the Company							
	Fair value reserve for financial assets measured at fair value	Share premium	Foreign currency translation reserve	Other reserves	Retained earnings	Total	Non- controlling interests	Total equity
Contributions by and distributions to owners								
Dividends	-	-	-	-	(15 564)	(15 564)	(3 966)	(19 530)
Total contributions by and distributions to owners	-	-	-	-	(15 564)	(15 564)	(3 966)	(19 530)
Changes in non-controlling interests in subsidiaries	-	-	-	-	(13 317)	(13 317)	32 787	19 470
Effect of the transaction under common control	-	-	-	-	(2 488)	(2 488)	-	(2 488)
Total transactions with owners	-	-	-	-	(31 369)	(31 369)	28 821	(2 548)
Balance at 31 December 2018 (restated*)	1 035 873	361	30 753	2 822	873 300	1 943 551	330 841	2 274 392

* Restated for the effect of a common control transaction (see Note 1).

Joint Stock Company Atomic Energy Power Corporation
 Summary (consolidated) statement of changes in equity for the year ended 31 December 2019
 (in millions of Russian roubles)

	Equity							
	Attributable to equity holders of the Company							
	Fair value reserve for financial assets measured at fair value	Share premium	Foreign currency translation reserve	Other reserves	Retained earnings	Total	Non- controlling interests	Total equity
Balance at 31 December 2018 (restated*)	1 035 873	361	30 753	2 822	873 300	1 943 551	330 841	2 274 392
Total comprehensive income for the year	-	-	-	-	120 786	120 786	19 610	140 396
Profit for the year	-	-	-	-	-	-	-	-
Other comprehensive loss	-	-	(19 078)	-	-	(19 078)	(6 482)	(25 560)
Foreign currency translation differences	-	-	(19 078)	-	-	(19 078)	(6 482)	(25 560)
Net change in fair value of financial assets measured at fair value	(9)	-	-	-	-	(9)	-	(9)
Remeasurements of defined benefit liability	-	-	-	(2 451)	-	(2 451)	-	(2 451)
Hedging reserve	-	-	-	451	-	451	-	451
Pension liabilities provision	-	-	-	87	(38)	49	38	87
Income tax recognized in other comprehensive income	-	-	2	-	-	492	-	492
Other comprehensive loss	(7)	-	(19 078)	(1 423)	(38)	(20 546)	(6 444)	(26 990)
Total comprehensive income for the year	-	-	(19 078)	(1 423)	120 748	100 240	13 166	113 406

* Restated for the effect of a common control transaction (see Note 1).

Joint Stock Company Atomic Energy Power Corporation
Summary (consolidated) statement of changes in equity for the year ended 31 December 2019
(in millions of Russian roubles)

	Equity						Total equity		
	Attributable to equity holders of the Company								
	Share capital	Share premium	Fair value reserve for financial assets measured at fair value	Foreign currency translation reserve	Other reserves	Retained earnings	Total	Non-controlling interests	Total equity
Contributions by and distributions to owners									
Dividends						(15 956)	(15 956)	(1 309)	(17 265)
Total contributions by and distributions to owners						(15 956)	(15 956)	(1 309)	(17 265)
Changes in non-controlling interests in subsidiaries						(1 297)	(1 297)	3 036	1 739
Total transactions with owners						(17 253)	(17 253)	1 727	(15 526)
Balance at 31 December 2019	1 035 873	361	435	11 675	1 399	976 795	2 026 538	345 734	2 372 272

Director
Chief Accountant

« 10 » April 2020


K.B. Komarov
V.A. Andrienko

* Restated for the effect of a common control transaction (see Note 1).

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Joint Stock Company Atomic Energy Power Corporation
Summary (consolidated) statement of cash flows for the year ended 31 December 2019
(in millions of Russian roubles)

	2019	2018 (restated*)
CASH FLOWS FROM OPERATING ACTIVITIES		
Profit before income tax	186 857	258 378
Adjustments for:		
Depreciation and amortization	109 827	94 352
Impairment losses on property, plant and equipment and intangible assets	5 166	26 953
(Gain)/loss on disposal of property, plant and equipment, intangible assets and other assets	(1 011)	3 011
Share of net profit of equity accounted investees	(506)	(766)
Gain from change in accounting approach of joint ventures	-	(46 940)
Net finance costs/(income)	21 316	(24 582)
Changes in estimated allowance for expected credit losses	5 640	6 550
Impairment losses on inventories	67	305
Change and accrual of provisions	34 672	(8 839)
Other	1 755	(2 183)
Cash from operating activities before changes in working capital	363 783	306 239
Change in inventories	(30 025)	(204)
Change in trade and other receivables	(67 286)	64 536
Change in other taxes receivable	529	(353)
Change in trade and other payables	54 425	(31 538)
Change in other taxes payable	7 244	1 514
Cash flows from operations before income tax and interest paid	328 670	340 194
Income tax paid	(59 532)	(58 039)
Interest paid	(16 833)	(17 812)
Net cash from operating activities	252 305	264 343
CASH FLOWS FROM INVESTING ACTIVITIES		
Interest received	13 457	12 702
Dividends received from equity accounted investees	227	38
Acquisition of property, plant and equipment	(190 116)	(134 945)
Acquisition of intangible assets	(7 146)	(6 684)
New deposits	(155 423)	(29 019)
Redemption of deposits	86 432	26 766
Purchase of promissory notes, investments and joint ventures	(70 279)	(9 147)
Proceeds from the sale of promissory notes	27 047	-
Proceeds from business combination	-	4 921
Disposal of subsidiaries	(41)	(4)
Loans given to other entities	(4 469)	(9 849)
Proceeds from loans given to other entities	6 220	25 497
Proceeds from disposal of property, plant and equipment and intangible assets	6 162	4 397
Proceeds from grants and other financing	4 567	6 009
Net cash used in investing activities	(283 362)	(109 318)

* Restated for the effect of a common control transaction (see Note 1).

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	2019	2018 (restated*)
CASH FLOWS FROM FINANCING ACTIVITIES		
Repayment of lease obligations	(2 994)	-
Proceeds from loans and borrowings	98 306	148 928
Repayment of borrowings and bonds	(138 320)	(167 238)
Dividends paid	(19 747)	(18 350)
Net cash used in financing activities	(62 755)	(36 660)
Net (decrease)/increase in cash and cash equivalents	(93 812)	118 365
Cash and cash equivalents at the beginning of the period	371 689	228 335
Effect of movements in foreign exchange rates on cash and cash equivalents	(17 109)	24 989
Cash and cash equivalents at the end of the period	260 768	371 689

Director

Chief Accountant

« 10 » April 2020



K.B. Komarov

V.A. Andrienko

* Restated for the effect of a common control transaction (see Note 1).

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1 The criteria for the preparation of summary (consolidated) financial Statements

These summary consolidated financial statements, which comprise the summary (consolidated) statement of financial position as at 31 December 2019, the summary (consolidated) statement of profit and loss, the summary (consolidated) statement of comprehensive income, the summary (consolidated) statement of changes in equity and the summary (consolidated) statement of cash flows for 2019 have been prepared by extraction, without any modification, of the relevant statements from the consolidated financial statements of Joint Stock Company "Atomic Energy Power Corporation" and its subsidiaries prepared in accordance with International Financial Reporting Standards for the year ended 31 December 2019 (hereinafter "consolidated financial statements"). Comparative data in the consolidated financial statements was restated the effect of a transaction under common control. All notes to the consolidated financial statements were not included in these summary (consolidated) financial statements.

Accordingly, these summary (consolidated) financial statements are consistent with those consolidated financial statements, which are available on the official website of Joint Stock Company "Atomic Energy Power Corporation".

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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 (SSGolovachev@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. WHICH 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:

- | | |
|--|--|
| <input type="checkbox"/> Employee of JSC Atomenergoprom or ROSATOM | <input type="checkbox"/> Representative of a customer / consumer of goods and services |
| <input type="checkbox"/> Employee of an organization forming part of JSC Atomenergoprom or ROSATOM | <input type="checkbox"/> Representative of a business partner |
| <input type="checkbox"/> Representative of the federal government | <input type="checkbox"/> Representative of a non-governmental organization |
| <input type="checkbox"/> Representative of a regional government | <input type="checkbox"/> Representative of the media |
| <input type="checkbox"/> Representative of a local government | <input type="checkbox"/> Representative of the expert community |
| <input type="checkbox"/> Representative of a contractor/supplier | <input type="checkbox"/> Other (please specify) |

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