

ANNUAL REPORT

JSC ATOMENERGOPROM









ANNUAL REPORT



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JSC ATOMENERGOPROM TODAY WWWW

SHARE OF NPPS IN ELECTRICITY OUTPUT IN RUSSIA

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JSC ATOMENERGOPROM TODAY

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GRI 2-1 COMPANY PROFILE

- Joint-Stock Company Atomic Energy Power Corporation (JSC Atomenergoprom).
- Primary state registration number (OGRN): 1077758081664.
- State registration date: 19 July 2007.
- State registration authority: Inter-District Inspectorate No. 46 of the Federal Tax Service in Moscow.
- Location: 24 Bolshaya Ordynka Street, Moscow.
- Tel.: +7 (495) 969-29-39.
- Fax: +7 (495) 969-29-36.
- Official website: www.atomenergoprom.ru

Shareholders of JSC Atomenergoprom 1.

Holders of record of JSC Atomenergoprom as at 31 December 2022:

1.1. State Atomic Energy Corporation Rosatom.

- Location: 24 Bolshaya Ordynka Street, Moscow, 119017.
- Status of the holder of record: shareholder.
- Interest in the Company's authorised share capital: 95.3317%
- Portion of voting shares held by the entity: 100%.

1.2. Russian Federation represented by the Russian Ministry of Finance.

- Location: 9 Ilyinka Street, Moscow, 109097.
- Status of the holder of record: shareholder.
- Interest in the Company's authorised share capital: 4.6683%
- Portion of voting shares held by the entity: 0%.

Auditor of JSC Atomenergoprom 2.

- INN: 7701017140.
- OGRN: 1027700058286.
- Tel.: +7 (495) 737-53-53.
- Fax: +7 (495) 737-53-47.
- Email: fbk@fbk.ru.

- INN: 7702019950.
- OGRN: 1027700125628.

3. Registrar of JSC Atomenergoprom's shares

- Registrar Company R.O.S.T.:
- Abbreviated company name: JSC IRC R.O.S.T.
- INN: 7705038503.
- OGRN: 1027739216757.
- Licence: 045-13976-000001.
- Date of issue: 3 December 2002.
- Expiry date: perpetual licence.
- (Federal Financial Markets Service).

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.

Full name: LLC Financial and Accounting Consultants (LLC FBK) Location: 44/1 Myasnitskaya Street, Moscow, 101990.

JSC Kept is the auditor for the summary consolidated IFRS financial statements for 2022. Full company name: Joint-Stock Company Kept (Joint-Stock Company KPMG until 1 July 2022). Abbreviated company name: JSC Kept (JSC KPMG until 1 July 2022). Location: room 24e, office I, 3rd floor, 16, Bldg. 5, Olimpiysky Avenue, Moscow, 129110.

The shareholder register of JSC Atomenergoprom is kept by Joint-Stock Company Independent

Location: office IX, 18, Bldg. 5B, Stromynka Street, Moscow, 107996.

- Licensing authority: Russian Federal Commission for the Securities Market

- Date from which the registrar has kept the issuer's shareholder register: 28 October 2009.

GRI 2-22 MESSAGE FROM THE MANAGEMENT

Dear colleagues and partners,

In the reporting year, JSC Atomenergoprom's business, along with the rest of the world, was faced with multiple challenges. Nevertheless, we successfully responded to these challenges and accomplished all our tasks.

Amid global turbulence, the Company demonstrated strong operational and financial performance. Its revenue under IFRS increased by 26.9% compared to 2021 and reached RUB 1,396.5 billion (2021: RUB 1,100.6 billion).

In 2022, the Company remained a leader in low-carbon power generation in Russia: nuclear power generation reached a new all-time high once again, with the Company's nuclear power plants producing 223.4 billion kWh of electricity (+0.4% year on year). The share of nuclear power in the total electricity output in Russia remains at 19.9%. Nuclear power generation in Russia helps to prevent greenhouse gas emissions into the atmosphere exceeding 100 million tonnes of CO_2 equivalent per year.

In the reporting year, the Company successfully accomplished all its operational objectives. Progress was made on construction projects both in Russia and abroad. The construction of the first lithium-ion battery 'gigafactory' was started in the Kaliningrad Region. The construction of a new building of the Dmitry Rogachev National Medical Research Centre of the Russian Ministry of Health was completed. A registration certificate was obtained for the Onvx radiation therapy facility based on a linear electron accelerator, which had been developed by JSC Atomenergoprom's enterprises. The Mechanical Engineering Division completed the first operability tests of a unique LNG pump. A contract was concluded with a Brazilian state-owned corporation for the supply of urani-

In the reporting year, JSC Atomenergoprom's um products for Angra NPP to meet 100% of its business, along with the rest of the world, was needs for the next five years.

The Company is expanding the scope of its business to achieve its strategic objective of increasing the share of new businesses in revenue. For instance, in the reporting year, the scope of JSC Atomenergoprom was expanded to include JSC Quadra – Power Generation, which supplies heat and electricity to regions of the Central Federal District.

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.

At the end of the reporting year, the Company operated seven wind power plants in Russia with a total capacity of 780 MW. Plans for 2023 include commissioning two more wind power plants with a total capacity of 255 MW and acquiring projects outside the Russian Federation. The target for the total installed capacity of overseas wind farms to be owned by the Company by 2030 has been set at 5 GW.

JSC Atomenergoprom continues to apply green finance instruments: 2022 saw the second placement of green bonds worth RUB 9 billion on the Moscow Exchange. Compliance of the bond issue with the Green Bond Principles of the International Capital Market Association (ICMA) and with the green finance criteria established in the Russian Federation was verified by the Expert RA rating agency. Overall, by year-end 2022, the Company had raised 19 external green loans totalling more than RUB 200 billion, including ESG loans and green bonds. Safety is a top priority for JSC Atomenergoprom. In the reporting year, as in previous years, all nuclear facilities operated safely and reliably, with no safety-relevant events recorded by the Company.

In 2023, we plan to continue to carry out contracts for new NPP construction in Russia and abroad, supply key equipment and increase revenues from new products. The key objective is to fulfil all commitments taken on by the Company under existing contracts both in Russia and abroad.



Ekaterina Lyakhova Chair of the Board of Directors of JSC Atomenergoprom We are confident that the Company will accomplish all its objectives. We would like to thank our partners for fruitful cooperation and to give our thanks to employees of JSC Atomenergoprom's organisations for their efficient work. We have great potential enabling us to adequately respond to major macroeconomic challenges and drive the Company's long-term growth.

Kirill Komarov

Director of JSC Atomenergoprom

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GRI 2-1 JSC ATOMENERGOPROM TODAY GRI 2-6

Joint-Stock Company Atomic Energy Power Corporation (JSC Atomenergoprom or the Company) is an integrated company that consolidates civilian assets of the Russian nuclear industry. JSC Atomenergoprom is an organisation of State Atomic Energy Corporation Rosatom (ROSATOM).

The organisations of JSC Atomenergoprom (taking into account ROSATOM's portfolio) comprise a complete cycle of nuclear production ranging from uranium mining to NPP construction and electricity generation. The organisations give priority to improving product guality, introducing innovative technologies and environmental management.

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

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

For details, see the section 'Business Diversification'...

JSC Atomenergoprom today



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

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

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

As at 31 December 2022, JSC Atomenergoprom's scope of consolidation in accordance with IFRS comprised 222 companies of different legal forms.

As at 31 December 2022, the shareholders of JSC Atomenergoprom were ROSATOM (95.3317%)³ and the Russian Federation represented by the Russian Ministry of Finance (4.6683%).

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Including the portfolio of ROSATOM.

Within the Unified Power System of Russia.

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³.ROSATOM holds 100% of voting shares in JSC Atomenergoprom

HISTORY OF JSC ATOMENERGOPROM



KEY EVENTS IN 2022

NPP and WPP construction

Mav

A permit was obtained for the construction of the Kuzminskava WPP in the Stavropol Territory.

June

- An agreement on cooperation in the implementation of wind power projects was signed with the government of the Chukotka Autonomous District.
- The Company obtained a permit for the construction of the 95 MW Trunovskaya WPP in the Stavropol Territory.

July

- Official ceremonies were held to mark the start of concreting at the site of power unit No. 1 of El Dabaa NPP in Egypt (20 July) and the start of concreting of the foundation of power unit No. 2 (November 2022).
- On 21 July, concreting was started at the construction site of power unit No. 4 of Akkuyu NPP in Turkey.

August

- An agreement was signed with An Xuan Energy (Vietnam) to jointly implement a wind power project in the Son La Province.
- December
- The Berestovskaya WPP in the Stavropol Territory was put into operation.

New products and technological sovereignty

March

The Mechanical Engineering Division completed the first operability tests of a liquefied natural gas (LNG) pump.

August

An official ceremony was held to mark the start of pilot operation of the first industrial facilities forming part of the Nuclear Research and Technology Centre in El Alto, Bolivia.

September

A cooperation agreement was signed with China Energy Engineering Corporation to build a hydrogen production plant on Sakhalin Island.

October

- The construction of the first lithium-ion battery 'gigafactory' was started in the Kaliningrad Region.
- The construction of the first stage of a data centre in Innopolis (Republic of Tatarstan) was started.
- X5 Group acquired licences for the use of an RPA platform, Atom. RITA (Robotic Intelligent Technology Assistant), to configure and support software robots.

November

 JSC SCP started to develop technologies for stable isotope production based on fractional distillation and chemical isotope exchange.

December

Small nuclear power plants

September

The engineering design of the RITM-200N reactor unit was developed.

Business development

January

JSC Quadra – Power Generation was included in the scope of the Company. It supplies heat and electricity to regions of the Central Federal District.

December

2023 and 2027.

Environmental protection

April

Ο

in the Leningrad Region.

Research and innovations

April

 The Russian poloidal field coil (for plasma containment) for the ITER international project in France underwent the final test.

July

 A registration certificate was obtained for the Onyx radiation therapy facility based on a linear electron accelerator.

December

- The welding of the support plate for the innovative BREST-OD-300 fast reactor, which is being built in Seversk (Tomsk Region) as part of the Proryv Project, was started.

The construction of a new building of the Dmitry Rogachev National Medical Research Centre of the Russian Ministry of Health was completed.

- A contract was concluded with a Brazilian state-owned company Industrias Nucleares do Brasil for the supply of uranium products for Angra NPP to meet 100% of its needs between
- The main stage of the site restoration project was started at the Krasny Bor landfill

GRI 2-6 KEY RESULTS IN 2022

Indicator	2020	20214	2022	2022/2021,%
Revenue under IFRS, RUB billion	934.7	1,100.6	1,396.5	126.9
EBITDA ⁵ , RUB billion	335.3	397.9	425.0	106.8
Profit under IFRS, RUB billion	168.2	203.9	159.6	78.3
Assets under IFRS, RUB billion	3,720	4,108	5,404	131.5
Intangible assets, RUB billion	186.6	186	203	109.1
Nuclear power generation, billion kWh	215.7	222.4	223.4	100.4
NPP capacity factor, %	81.1	83.18	86.21	103.6
Uranium resources, '000 tonnes ⁶	509.4	506.4	503.7	99.5
Uranium production, tonnes ⁷	7,122	7,149	6,965	97.4
Overseas NPP construction projects, number of power units ⁸	36°	35 ¹⁰	34	97.1
Portfolio of orders for new products (outside the scope of the nuclear industry), RUB billion ¹¹	1,602.1	1,974.1	2,250.0	114.0
Average salary in JSC Atomenergoprom, RUB '000 per month	95.2	105.3	113.5	107.8
Events rated at level 1 and above on the INES scale, number	0	0	0	0

4. Comparative data for 2021 have been recalculated due to the fact that in 2022:

- A subsidiary of the Group acquired shares of JSC SSC RIAR issued as part of additional share issuance. As a result, the Group increased its stake in the authorised share capital of JSC SSC RIAR to 56.73% and acquired control. Given that JSC SSC RIAR had been controlled by ROSATOM, this transaction has been recognised in the consolidated financial statements as a common control transaction; accordingly, comparative data for 2021 have been retrospectively adjusted;
- The Group carried out common control transactions involving a business acquisition in the mechanical engineering segment. In accordance with the Group's accounting policy, the financial results of the acquired business have been retrospectively reflected in the financial statements at book value, as recognised in the consolidated IFRS financial statements of the transferring entity.
- 5. EBITDA = Operating results + Change in the provision for credit losses in selling expenses + Depreciation and amortisation + Adjustments for non-cash items of other expenses and income.
- Data on uranium resources of the Mining Division in the Russian Federation (Russian assets).
- Data on uranium production at ROSATOM's assets in Russia and abroad.
- Including the project portfolio of ROSATOM.
- Including power unit No. 1 of the Belarusian NPP, which was synchronised with the power grid and started to supply electricity to the integrated power system of the Republic of Belarus on 3 October 2020.
- 10. Excluding power unit No. 1 of the Belarusian NPP commissioned in 2021.
- 11. Including the order portfolio of ROSATOM.

Key financial results¹²

the set of the set		20	020	2021	2022	2022/2021, %	
Revenue		93	4.7 1,	100.6	,396.5	126.9	
Cost of sales		(61	1.6) (7	/05.4)	927.8)	131.5	
Gross profit		32	23.1 3	395.2	468.7	118.6	
Selling and administrative expense	es	(10)1.7) (1	06.9)	(140.1)	131.1	
Other income/(expenses), net		(2	1.8)	(9.8)	(35.4)	361.2	
Financial income/(expenses), net		2	3.5 (18.2)	(77.7)	426.9	
Share in the (loss)/profit of investm using the equity method	ents accounted f	or 2	2.8	10.8	9.3	86.1	
Income tax expense		(5	7.7) (67.2)	(65.2)	97.0	
Profit for the year after tax		16	58.2 2	03.9	159.6	78.3	
Other comprehensive income/(expenses)	2	8.7 (15.9)	28.3	-178.0	
Total comprehensive income for t	ne year	19	96.9	88.0	187.9	99.9	
Net operating profit after tax (I		14	1.9 2	11.3	228.0	107.9	
Structure of revenue from sales to external customers by operating segment Indicator 2020 2021 2022							
Indicator	20.	l customers	by operatin	ng segment	1 Con	2022	
Indicator Operating segment	20. RUB billion	l customers 20 % of the total	by operatin 2 RUB billion	ng segment 021 % of the total	RUB bill	2022 lion % of the total	
Indicator Operating segment Electricity Generation	20. RUB billion 518.1	20 % of the total 55.4	RUB billion 611.6	021 % of the total 55.6	RUB bill	2022 lion % of the total 9 45.4	
Indicator Operating segment Electricity Generation Sales and Trading	20 RUB billion 518.1 158.1	l customers 20 % of the total 55.4 16.9	by operatin	021 % of the total 55.6 18.5	RUB bill 633.9 256.9	2022 lion % of the total 0 45.4 5 18.4	
Indicator Operating segment Electricity Generation Sales and Trading Fuel	RUB billion 518.1 158.1 84.5	1 customers 20 % of the total 55.4 16.9 9	by operatin 2 RUB billion 611.6 204.2 85.1	bg segment 021 % of the total 55.6 18.5 7.7	RUB bill 633.9 256.9 111.8	2022 lion % of the total 0 45.4 5 18.4 8 8	
Indicator Operating segment Electricity Generation Sales and Trading Fuel Mechanical Engineering	200 RUB billion 518.1 158.1 84.5 69.7	1 customers 20 % of the total 55.4 16.9 9 7.5	by operatin 2 RUB billion 611.6 204.2 85.1 79.9	bg segment 021 % of the total 55.6 18.5 7.7 7.3	RUB bill 633.9 256.9 1111.8 81.3	X X O Iion % of the total % of the total Iion 45.4 18.4 Iion 8 8 Iion 5.8 5.8	
Indicator Operating segment Electricity Generation Sales and Trading Fuel Mechanical Engineering Mining	RUB billion 518.1 158.1 84.5 69.7 4.9	I customers 20 % of the total 55.4 16.9 9 7.5 0.5	by operatin	Segment 021 % of the total 55.6 18.5 7.7 7.3 0.6	RUB bill 633.9 256.9 111.8 81.3 8.9	2022 lion % of the total 0 45.4 5 18.4 8 8 5 5.8 0.6	
IndicatorOperating segmentElectricity GenerationSales and TradingFuelMechanical EngineeringMiningREIN	200 RUB billion 518.1 158.1 84.5 69.7 4.9 15.4	1 customers 20 % of the total 55.4 16.9 9 7.5 0.5 1.6	by operatin	Weight and the segment 021 % of the total 55.6 18.5 7.7 7.3 0.6 1.6	RUB bill 633.9 256.9 1111.8 81.3 8.9 8.8	X X S X 0 0 X 0 0 X 0 0 X 0 0 X 0 0 X 0 0 X 0 0 X 0 0	
IndicatorOperating segmentElectricity GenerationSales and TradingFuelMechanical EngineeringMiningREINMC Delo	RUB billion 518.1 158.1 84.5 69.7 4.9 15.4 0.0	I customers 20 % of the total 55.4 16.9 9 7.5 0.5 1.6 0.0	by operatin RUB billion 611.6 204.2 85.1 79.9 6.7 17.7 0.0	Segment 021 % of the total 55.6 18.5 7.7 7.3 0.6 1.6 0.0	RUB bill 633.9 256.9 111.8 81.3 8.9 8.8 95.4	2022 lion % of the total 0 45.4 5 18.4 8 8 5 5.8 0.6 0.6 0.6 6.8	
IndicatorOperating segmentElectricity GenerationSales and TradingFuelMechanical EngineeringMiningREINMC DeloOther operating segments	Esto externa 200 RUB billion 518.1 158.1 84.5 69.7 4.9 15.4 0.0 84.0	20 % of the total 55.4 16.9 9 7.5 0.5 1.6 0.0 9	by operatin 2 RUB billion 611.6 204.2 85.1 79.9 6.7 17.7 0.0 95.4	Segment 021 % of the total 55.6 18.5 7.7 7.3 0.6 1.6 0.0 8.7	RUB bill 633.9 256.9 1111.8 81.3 8.9 8.8 95.4 199.9	X X O 0 45.4 0 45.4 0 18.4 3 8 5.8 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 14.4	

Indicator	20	20	20	21	2022		
Operating segment	RUB billion	% of the total	RUB billion	% of the total	RUB billion	% of the total	
Electricity Generation	518.1	55.4	611.6	55.6	633.9	45.4	
Sales and Trading	158.1	16.9	204.2	18.5	256.5	18.4	
Fuel	84.5	9	85.1	7.7	111.8	8	
Mechanical Engineering	69.7	7.5	79.9	7.3	81.3	5.8	
Mining	4.9	0.5	6.7	0.6	8.9	0.6	
REIN	15.4	1.6	17.7	1.6	8.8	0.6	
MC Delo	0.0	0.0	0.0	0.0	95.4	6.8	
Other operating segments	84.0	9	95.4	8.7	199.9	14.4	
TOTAL	934.7	100	1,100.6	100	1,396.5	100	

12. Comparative data for 2021 have been recalculated due to the fact that in 2022:

- retrospectively adjusted;
- the consolidated IFRS financial statements of the transferring entity.

Consolidated financial results of JSC Atomenergoprom under IFRS, RUB billion

 A subsidiary of the Group acquired shares of JSC SSC RIAR issued as part of additional share issuance. As a result, the Group increased its stake in the authorised share capital of JSC SSC RIAR to 56.73% and acquired control. Given that JSC SSC RIAR had been controlled by ROSATOM, this transaction has been recognised in the consolidated financial statements as a common control transaction; accordingly, comparative data for 2021 have been

• The Group carried out common control transactions involving a business acquisition in the mechanical engineering segment. In accordance with the Group's accounting policy, the financial results of the acquired business have been retrospectively reflected in the financial statements at book value, as recognised in

Cost of sales

Cost structure, RUB billion

Cost of sales	2020	2021	2022	2022/2021,%
Materials and fuel	179.0	212.3	332.6	156.7
Staff costs	150.1	161.4	207.0	128.3
Cost of electricity purchased for resale and for own use	38.6	58.1	70.1	120.7
Electricity transmission services	25.7	28.1	30.4	108.2
Depreciation and amortisation	110.8	113.1	103.9	91.9
Production services of third-party contractors	33.0	49.6	57.5	115.9
Property tax and other taxes and payments to the budget	20.6	21.6	24.3	112.5
Transport costs	8.3	9.5	70.1	737.9
Other expenses	64.4	60.8	97.9	161.0
Changes in finished goods and work in progress	(18.9)	(15.8)	(43.6)	275.9
TOTAL	611.6	705.4	927.8	131.5

Structure of the statement of financial position

Key changes in the asset structure, RUB billion

Indicator	31 December 2020	31 December 2021	31 December 2022
Goodwill	48	49	126
Intangible assets	187	186	203
Property, plant and equipment	1,992	2,167	2,815
Financial investments	164	187	288
Loans issued	137	113	101
Bank deposits	80	274	181
Cash	315	217	491
Accounts receivable	407	464	656
Inventory	234	236	316
Other current assets	8	12	15
Other non-current assets	148	203	212
TOTAL	3,720	4,108	5,404

Indicator	31 December 2020	31 December 2021	31 December 2022
Provisions	296	253	251
Accounts payable	582	593	840
Borrowings	221	438	1,238
Other liabilities	103	136	209
Non-controlling interest	344	79	133
Retained earnings	1,108	1,363	1,465
Equity	1,066	1,246	1,268
TOTAL	3,720	4,108	5,404

Key financial and economic indicators

Debt-to-equity ratio Liquidity ratios Quick ratio Current ratio Turnover indicators, days Inventory turnover Accounts receivable turnover
Liquidity ratios Quick ratio Current ratio Turnover indicators, days Inventory turnover Accounts receivable turnover
Quick ratio Current ratio Turnover indicators, days Inventory turnover Accounts receivable turnover
Current ratio Turnover indicators, days Inventory turnover Accounts receivable turnover
Turnover indicators, days Inventory turnover Accounts receivable turnover
Inventory turnover Accounts receivable turnover
Accounts receivable turnover
Accounts payable turnover
Profitability ratios, %
Return on sales (ROS)
Return on assets (ROA)
Return on equity (ROE)

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

or	2020	2021	2022
	0.35	0.40	0.63
	1.49	1.49	1.36
	1.93	1.87	1.69
	83	78	72
	60	63	67
	111	125	141
	18.0	18.5	11.4
	4.5	5.0	3.0
	6.7	7.6	5.6

Cash flow

Indicator	2020	2021	2022	2022/2021,%
Cash flow from operating activities before changes in working capital	348.0	393.1	439.9	111.9
Changes in working capital	(35.0)	(58.1)	(47.4)	81.6
Income tax paid	(93.9)	(69.7)	(61.4)	88.1
Interest paid	(14.8)	(16.6)	(47.3)	284.9
Net cash flow from operating activities	204.3	248.7	283.8	114.1
Capital expenditures	(243.3)	(358.0)	(541.1)	151.1
Other	46.3	(161.4)	(32.5)	20.1
Net cash flow used in investing activities	(197.0)	(519.4)	(573.6)	110.4
Net changes in total debt	26.0	222.2	622.9	280.3
Payment of lease liabilities	(3.8)	(4.1)	(4.0)	97.6
Dividends paid	(23.4)	(41.9)	(42.1)	100.5
Acquisition of non-controlling interest	(7.2)	-	(4.3)	
Net cash flow from/(used in) financing activities	(8.4)	176.2	572.5	324.9
Net (decrease)/increase in cash and cash equivalents	(1.1)	(94.5)	282.7	(299.2)
Cash and cash equivalents at the beginning of the reporting period	280.4	314.7	216.9	68.9
Effect of movements in foreign exchange rates on cash and cash equivalents	34.8	(3.3)	(8.6)	260.6
Cash and cash equivalents at the end of the reporting period	314.1	216.9	491.0	226.4

Approach to taxation

JSC Atomenergoprom is a major taxpayer in Russia. Its organisations make significant contributions to budget revenue in their regions of operation. Information on taxes paid is regularly provided to regional administrations, the Government and the President of the Russian Federation. JSC Atomenergoprom views strict compliance with laws as a necessary prerequisite for the implementation of its strategy.

In order to develop a single approach and minimise tax risks, ROSATOM develops and regularly updates the following uniform industry-wide documents regulating tax matters for JSC Atomenergoprom and its organisations: the Uniform Accounting Policy for Taxation; the Methodological Guidelines on Tax Due Diligence of Transactions; the Methodological Guidelines and Procedure for Communication on Transfer Pricing Matters; the Procedure for Calculating Income Tax for Controlled Foreign Companies and the Methodological Guidelines on Inspecting and Classifying Foreign Entities for the Purpose of Income Tax Calculation in the Russian Federation; the Procedure for Compiling Country-by-Country Data; the Methodological Guidelines on Identifying and Assessing Risks to Be Identified for the Purpose of Tax Monitoring; the Methodological Guidelines on Assessing the Applicability of Benefits under Tax Treaties (MLI).

Tax management, control and risk management

JSC Atomenergoprom has developed and operates a corporate risk management system on an ongoing basis. The tax risk management process is aimed at preventing or minimising risks, analysing the outcomes of the relevant measures and disclosing information on risks. Tax risk management approaches are regulated by uniform industry-wide guidelines and recommendations. In addition, those organisations that have joined the tax monitoring programme prepare quarterly tax risk reports to be submitted to tax authorities, as required by the Federal Tax Service of Russia (the risk register is compiled and updated based on the Industry-Wide Risk Library).

The performance of the tax function of JSC Atomenergoprom's subsidiaries is monitored by ROSATOM, which sets the relevant key performance targets (for the materiality of errors and for the share of nondeductible expenses).



BUSINESS STRATEGY

RUB TRILLON TARGET REVENUE BY 2030

BUSINESS STRATEGY

2.1. BUSINESS STRATEGY UNTIL 2030

Business context

Trends in the development of the nuclear industry

The development of the nuclear industry is influenced by a number of factors, including¹³:

- Global population growth from 7.9 billion people in 2022 to 8.5 billion people by 2030 and an increase in the share of urban population from 57% to 60%;
- Global GDP growth of around 3% per year;
- Growth of global electricity output and consumption. Global electricity output is expected to increase by 22.9% compared to 2021 and reach 34.8 TWh as early as in 2030, with the Asia Pacific region accounting for two thirds of the growth;
- Accelerating greenhouse gas accumulation. In 2022, carbon dioxide emissions reached a new high of more than 36.8 billion tonnes. In 2022, the increase in emissions totalled less than 1%, well below the 6% growth in 2021, which was due to an accelerated economic recovery after the start of the COVID-19 pandemic. The level of global carbon dioxide emissions remains stable, which necessitates more decisive action to accelerate the transition to clean energy and achieve climate targets.

The development of low-carbon power generation, including nuclear power, is a necessary prerequisite for reducing emissions and achieving international climate targets. In recent years, environmental aspects of the electricity industry have come under closer scrutiny, which has drivJSC Atomenergoprom has identified two groups of factors that have the most significant impact on the Company's global operations:

- 1. 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, despite persisting political pressure and a general trend towards growing protectionism.
- 2. The technological landscape. Global technology trends form a separate set of challenges for the development of the industry. New technologies are evolving rapidly; global markets are increasingly shaped by trends that started to emerge as recently as five to ten years ago, such as the rapid development of renewable energy generation, exponential growth of the scale of digital transformation in manufacturing, growing markets for new materials and manufacturing solutions. The rate of innovation is also accelerating, and, as a result, technological solutions become obsolescent increasingly fast. Strategic development takes into account both the current set of global technology trends and the level of their development.

en an increase in the share of low-carbon power in the global energy mix. In 2022, amid price shocks, rising inflation and disruptions to traditional energy supply chains, the global commitment to low-carbon and sustainable energy solutions was reaffirmed and strengthened. The zero-emissions strategy adopted by major economies will significantly accelerate the electrification of the global economy, which will necessitate active development of all zero-carbon energy sources, including nuclear power generation.

In the long term, the global nuclear power industry as an energy source will remain in demand. In February 2022, the European Commission adopted a resolution on the inclusion of nuclear power in the EU Green Taxonomy, a classification of sustainable activities for investors. The International Energy Agency¹⁴ forecasts an increase in installed nuclear capacity from the current level of 393.8 GW¹⁵ to 471 GW by 2030.

Thermal power generation will yield to nuclear energy primarily because of CO₂ emissions. This has a negative impact on the environment and drives up the cost of energy since many countries have imposed CO₂ emission fees. Projects to install CO₂ capture and utilisation systems at thermal power plants in order to minimise emissions are expected to be developed in the future. However, current estimates show that an increase in the LCOE of thermal power plants by more than 40–60% will make them economically unviable.

Due to these factors, nuclear power will remain in demand in the long term.

The Company's competitive position

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

Long-term strategic goals

of ROSATOM.

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

JSC Atomenergoprom'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 (Build – Own – Operate) scheme) and building project infrastructure (legal framework, employee training, community relations, etc.).

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

JSC Atomenergoprom's strategic development is underpinned by the long-term business strategy

^{14.} IEA, World Energy Outlook 2022 (STEPS).

^{15.} Power Reactor Information System (PRIS) of the IAEA (https://pris.iaea.org).

^{13.} Data from the World Bank, the IMF, the IEA World Energy Outlook 2022 (Stated Policies Scenario), IEA CO, Emissions in 2022, and the IAEA.

The development of ROSATOM and JSC Atomenergoprom is based on the long-term technological

JSC Atomenergoprom is taking steps to accomplish ROSA-TOM's mission of leveraging the achievements of nuclear science and modern high technology for the benefit of humanity.

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 and conversion services, nuclear fuel fabrication, etc.).

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

JSC Atomenergoprom'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.

The global energy crisis caused by geopolitical tensions and restrictive policies adopted by certain countries was a major external factor in 2022. Most countries responded to the crisis by closely focusing on energy security, diversifying the energy mix and increasing investment in clean energy sources.

For JSC Atomenergoprom as a global player on the nuclear technology and wind power markets, this opens up opportunities for further expansion into international markets, primarily with product offers focused on zerocarbon energy and targeted at emerging markets.

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

'Sustainable Development Management'. The business strategy provides general guidelines for

For details, see the section

the long term, shapes the target vision for 2030 and sets a framework for development.

The vision of JSC Atomenergoprom is to become a global technological leader. Accordingly, the Company intends to expand the scale of its business to match existing global technological leaders.

By 2030, ROSATOM intends to increase its revenue (including the portfolio of JSC Atomenergoprom) to RUB 4 trillion, with the share of new products in revenue expected to increase several times over; the Corporation also intends to expand its overseas footprint.

The vision provides an industry-wide focus on developing modern high technology and sets ambitious goals for each of the prioritised areas.

Thus, the overall goal of expanding the scale of business is decomposed. In the sphere of nuclear power generation, this helps to maintain the continuity of strategic goals, enabling the Company to remain an undisputed leader in the global nuclear industry.

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

- corresponding revenue;
- and the cost of electricity (LCOE);
- businesses in revenue significantly by 2030;
- global technological leaders.

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

Key strategy implementation risks

- Economic risks (including financial risks, such as currency, interest rate and credit risks, etc.);
- well as reputational risks);
- products);
- Political risks;
- Technical (project) risks;
- Climate risks (including environmental and energy transition risks).

The Company has set itself four long-term strategic goals to be achieved by 2030:

 To increase the international market share. To assert their leadership on the global nuclear power market, ROSATOM and JSC Atomenergoprom are currently expanding their footprint in over 50 countries around the world and the long-term portfolio of overseas orders and increasing the

- To reduce production costs and the lead time. In order to develop the most competitive products, ROSATOM and JSC Atomenergoprom will take further steps to reduce the duration of NPP construction

 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

- To achieve global leadership in state-of-the-art technology. ROSATOM and JSC Atomenergoprom seek to extend their global leadership beyond the nuclear industry. The Company intends to leverage its existing capabilities, the understanding of nuclear technologies and accumulated experience in order to diversify into new segments. In the future, ROSATOM aims to rank among international companies perceived as

For details on steps taken by the Company in order to increase its international market share, see the section 'International Business'.

- Necessary prerequisites for the implementation of the strategy

- Key risks that can affect the achievement of strategic goals include:
- Commercial risks (including risks associated with the nuclear fuel cycle product and service market, as

Operational risks (including the risk of losing critical knowledge of existing and newly created

Technological risks (including the risk of shortcomings in technology);

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

GRI 3-3 2.2. SUSTAINABLE DEVELOPMENT MANAGEMENT

Since 2020, ROSATOM has been a member of the UN Global Compact, an initiative with over 21,000 corporate participants in more than 160 countries.

In the course of their operations, ROSATOM and JSC Atomenergoprom are guided by global sustainable development priorities and adhere to the 10 principles of the UN Global Compact. ROSATOM and JSC Atomenergoprom contribute to the achievement of the UN Sustainable Development Goals (SDGs) through their product line, their financial and economic performance and their efforts to ensure the sustainability of internal environmental, social and governance processes.

JSC Atomenergoprom, which consolidates civilian The safety of technological solutions, safe working assets in the nuclear industry, plays a leading role in the implementation of ROSATOM's sustainability initiatives and the fulfilment of the relevant commitments.

conditions and environmental safety are a priority for the Company and all of its organisations. In addition, JSC Atomenergoprom is a responsible corporate citizen whose operations have a significant impact

on the economy of a large part of Russian regions and a range of foreign countries where the Company is building NPPs and other facilities. The Company's efforts to develop its business both in Russia and abroad are aligned with long-term sustainable development objectives, taking into account the special characteristics of each individual region. Nuclear technology drives systematic improvements in the guality of people's life. At present, the product portfolio of the Russian nuclear industry comprises not only conventional solutions in the sphere of nuclear power, but also new areas, such as nuclear medicine, nuclear research and technology centres based on research reactors, radiation processing facilities, etc. In addition, the Company is developing its business in a number of adjacent non-nuclear areas, including wind power, etc.

NPP construction and operation makes an important contribution to economic and infrastructure development both in Russia and in foreign customer countries. It guarantees long-term stable capacity utilisation for high-technology manufacturing enterprises, generates orders for companies in adjacent industries and provides employment for local communities, which translates into a corresponding contribution to GDP in the form of industry revenue and tax payments. The construction and operation of large NPPs provides employment for several thousand people, both at the plant itself and in the sphere of nuclear infrastructure.

Given the scale of their operations as a whole and individual NPP construction projects, ROSATOM and JSC Atomenergoprom make a major contribution to the achievement of the UN Sustainable Development Goals (SDGs), especially the following:

- 1. SDG 7 'Affordable and Clean Energy', SDG 8 'Decent Work and Economic Growth', SDG 9 'Industry, Innovation and Infrastructure', SDG 12 'Responsible Consumption and Production', SDG 13 'Climate Action' and SDG 17 'Partnership for Sustainable Development':
- 2. SDG 3 'Good Health and Well-Being', SDG 4 'Quality Education' and SDG 11 'Sustainable Cities and Communities' are also important for the industry:
- 3. ROSATOM and JSC Atomenergoprom attach special importance to preventing the negative impact of any aspect of their operations in terms of SDG 6 'Clean Water and Sanitation'. SDG 14 'Life Below Water' and SDG 15 'Life on Land'.

Key sustainable development results

In the context of sustainable development, it is important that sustainability should be recognised in official documents at the national level.

Nuclear power qualifies as 'green' in Russia's Taxonomy and in China's Green Bond Endorsed Projects Catalogue. Important developments in 2022 included the establishment of detailed criteria in the EU Sustainable Finance Taxonomy for nuclear power to qualify as a transitional activity. In late 2022, South Korea published a national Taxonomy, in which nuclear power is listed as a 'green' economic activity, provided that it meets a number of criteria. In addition, January 2023 saw the publication of the EAEU Taxonomy, in which nuclear power is also listed as a 'green' activity, provided that it meets basic sustainability criteria.

The sustainable development agenda is incorporated into ROSATOM's Business Strategy until 2030. The promotion of the 17 UN Sustainable Development Goals is explicitly stated in the Strategy as a vital prerequisite for its implementation.

Principles in the Nuclear Industry' held for top 30 executives in early 2022, which resulted in the drafting and publication of a memorandum of commitment of executives in the nuclear industry to the principles of sustainable development.

As a member of the UN Global Compact International Network, in 2022, ROSATOM prepared its second public sustainability report, which was published on the website of the UN Global Compact at https:// www.unglobalcompact.org. The report has been rated 'Active', which means that ROSATOM monitors a number of ESG indicators and operates in accordance with the 10 principles of the UN Global Compact in the sphere of human rights, labour, the environment and anti-corruption.

In 2022, the Corporation also joined the National ESG Alliance, which comprises companies leading the Russian ESG agenda. The National ESG Alliance aims to maintain and develop the sustainable development agenda in Russia. As a member of the ESG Alliance, the Corporation will contribute to the development of sustainability tools and practices, including full-scale involvement of the nuclear industry in national ESG initiatives.



RUB BILLION

TOTAL VALUE OF GREEN BONDS **PLACED IN 2022**

Sustainable development covers all employees in the industry; the Company regularly holds internal events and workshops on various aspects of sustainable development for its employees and executives, including events attended by ROSATOM's Director General. This included a strategic session titled 'Sustainability

> Executives' Memorandum of Commitment: https://www.rosatom.ru/upload/iblock/77c/77ca16df76 f36811cfa6ed0c7b7d5279.pdf

The level of sustainability maturity of JSC Atomenergoprom as a company of ROSATOM is regularly confirmed by independent ESG ratings. In 2022, the Russian Analytical Credit Rating Agency (ACRA) rated ROSATOM at ESG-3 and assigned it to the ESG-B category, which corresponds to a very high environmental, social and governance score (the assessment was solicited, and the Company's Divisions participated in the rating process). The assessment took into account information on the performance of the Company's four key Divisions: the Mining, Sales and Trading, Fuel and Power Engineering Divisions, given their significant contribution to the Company's overall performance.

JSC Atomenergoprom continues to apply green finance instruments. 2022 saw the second placement of green bonds worth RUB 9 billion on the Moscow Exchange. Compliance of the bond issue with the Green Bond Principles of the International Capital Market Association (ICMA) and with the green finance criteria established by Decree No. 1587 of the Government of the Russian Federation dated 21 September 2021 was verified by the Expert RA rating agency. Overall, by year-end 2022, the Company had raised 19 external green loans (ESG loans and green bonds) totalling more than RUB 200 billion to refinance WPP construction projects and the Akkuyu NPP construction project (Turkey).

Assessment of greenhouse gas emissions. Contribution to the climate agenda

ROSATOM has conducted a pilot calculation of greenhouse gas emissions for 2022 for its entire corporate scope, including JSC Atomenergoprom and its organisations, in accordance with international methodologies (Scope 1 and Scope 2).

In 2022, greenhouse gas emissions from JSC Atomenergoprom's companies totalled 18.9 million tonnes of CO₂e, including direct emissions (Scope 1) totalling 16.7 million tonnes of CO₂e¹⁶.

The major share of the Company's direct greenhouse gas emissions (93%) is produced by JSC RIR, which manages heating networks in the towns and cities in which the Company operates (mainly coal- and gas-fired CHPPs) to ensure steady energy supply to consumers. As part of its efforts to improve energy efficiency, the Company upgrades its power generation capacities.

At the same time, it should be noted that JSC Atomenergoprom's core product, namely nuclear power, is a low-carbon energy source, as direct emissions from nuclear power plants are close to zero. In Russia, nuclear power generation accounts for almost half of the total low-carbon power generation. NPPs currently in operation in Russia help to prevent greenhouse gas emissions exceeding 100 million tonnes per year, or about 7% of total emissions in the country.



GREENHOUSE GAS EMISSION SAVINGS AS A PERCENTAGE OF TOTAL EMISSIONS **IN RUSSIA**

In addition, JSC Atomenergoprom has been developing the wind power business since 2017. At year-end 2022, the Company operated seven wind power plants with a total capacity of 780 MW in the Republic of Adygea, the Stavropol Territory and the Rostov Region.

Total contribution of the Company's low-carbon power generation (NPPs and WPPs) to greenhouse gas emission savings in Russia





Since 2022, ROSATOM and JSC Atomenergoprom jointly with the Russian Ministry of Energy and other relevant government agencies have been involved in a major national-scale innovative project titled 'Full Life Cycle Low-Carbon Energy'. The Company, along with other nuclear organisations, is working to provide R&D support for the development and implementation of new approaches to developing full life cycle lowcarbon energy with a focus on nuclear power generation, hydrogen energy, renewable energy and energy storage systems based on new domestically-developed knowledge-intensive solutions and technologies.

Low-carbon power generation in Russia (the Company's NPPs and WPPs), billion kWh



GHG emission savings in Russia (the Company's NPPs and WPPs), million tonnes of CO₂e

^{16.} Including PJSC Quadra - Power Generation.

'Green' nuclear power: contribution to climate action

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

Nuclear power is characterised by one of the lowest levels of life-cycle greenhouse gas emissions among existing power generation options and plays a fundamental role in combating climate change. This fact was reflected, among other things, in the final resolution of the 27th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP27) held in November 2022 in Sharm El Sheikh (Equpt). In addition, in 2022, a separate IAEA pavilion, #Atoms4Climate, was provided for the nuclear power industry at the conference venue for the first time in the history of the COP climate conferences.

ROSATOM and JSC Atomenergoprom actively participated in the Conference of the Parties to the United Nations Framework Convention on Climate Change, including as part of the official delegation of the Russian Federation. The highlight of the COP27 programme in 2022 was the Energy Day on 15 November, including a public discussion titled 'Nuclear Energy Contribution to the Prosperity of Africa' held on the sidelines of the conference. Its participants included speakers from Egypt, Nigeria, Ghana and South Africa.

As part of an analysis of ESG requirements for nuclear power, in 2022, JSC Atomenergoprom conducted a detailed analysis of compliance of Russian nuclear technologies with the criteria established in the Complementary Delegated Act (CDA) to the EU Taxonomy. Compliance of Russian nuclear technologies and

EU Taxonomy Requirements for Nuclear Power: https://www.rosatom.ru/upload/iblock/8b0/8b0904100 471c4ccd37fe8a9f59c7110.pdf

projects with the requirements of the EU Taxonomy has been confirmed through the following groups of criteria: confirmation of the minimum level of greenhouse gas emissions, safety guarantees for the NPP operation stage, commitment to closing the nuclear

fuel cycle, and safe RAW and SNF management and NPP decommissioning. The findings of the analysis are publicly available on ROSATOM's website.

GRI 2-24 Fulfilment of responsible business commitments. Sustainable processes

Organisations in the industry adhere to the uniform industry-wide Policy on Sustainable Development of ROSATOM, which sets out the objectives and key principles guiding the efforts of JSC Atomenergoprom and its organisations in the sphere of health, safety and the environment, in the social sphere and in the sphere of corporate governance. In addition, in order to systematise sustainability initiatives in the industry, the Company applies and regularly updates the Uniform Industry-Wide Methodological Guidelines on the Management of Sustainability Initiatives.

Regulations concerning every aspect of sustainable development have been approved in the industry. They define the key principles underlying environmental, social and governance initiatives of JSC Atomenergoprom and its organisations, as well as the mechanisms for implementing these principles. These include the following documents adopted in ROSATOM and JSC Atomenergoprom and approved by ROSATOM's Director General: the Environmental Policy¹⁷ (approved in 2017), the Social Policy¹⁸ (approved in 2020), the Code of Ethics and Professional Conduct¹⁹ (approved in 2016), the Anti-Corruption Policy²⁰ (approved in 2015), the Human Rights Policy (developed and approved in 2022), etc.

The Company's sustainable development initiatives involve continuous process improvement, development of health, safety and environmental projects, development of a supply chain management system, as well as personnel management and development of the talent pool. Progress on various aspects of sustainable development is monitored on a regular basis. Tools used for measuring the Company's sustainability performance include ESG indicators approved in 2022 as part of an industry-wide library of ESG indicators. These include both universal ESG metrics (such as greenhouse gas emissions, the share of recycled and reused water, the share of women in the industry's workforce) and indicators specific to the nuclear industry, such as SNF processing volumes.

Efforts to implement sustainability principles extend beyond JSC Atomenergoprom: sustainability coordinators have been appointed in 24 holding companies and organisations in the industry; steps are being taken to operationalise the sustainable development agenda, and the relevant action plans are being implemented.

The Company's representatives participate in public discussions on sustainable development on Russian and international platforms. For instance, in 2022, the Company's representatives took part in discussions focused on sustainable development on platforms such as EXPO2020, COP27, SPIEF, and 'Arctic: Today and the Future'.

GRI 2-25 In order to develop sustainability competences, in 2022, a face-to-face training programme on sustainable development was launched for employees in the industry at ROSATOM's Corporate Academy. Representatives of 46 nuclear organisations completed the training; the programme will be run on a regular basis. The sustainability section of ROSATOM's online training system. RECORD Mobile, is regularly updated.

Systematic steps are taken in the industry to inform employees about sustainability priorities and objectives; workshops and other events are held, and employee surveys are conducted. A section titled 'Sustainable Development' has been created on the Corporation's intranet portal; it includes a Library of Industry Sustainability Practices designed to systematise existing approaches and enable organisations in the industry to share their experience.



https://rosatom.ru/upload/iblock/5c3/5c3ce2206d4406f2686f2e1fdec013c5.pdf
 https://rosatom.ru/upload/iblock/278/278a5b347258378ee344cfe106806484.pdf
 https://rosatom.ru/upload/iblock/d08/d08a5dc6dedea5cf251f81e14f8742d7.pdf

^{20.} https://www.rosatom.ru/upload/iblock/685/68595993dc72b393b5a60aaa95548e5b.docx

GRI 2-13 Allocation of responsibility for impact management and implementation of JSC Atomenergoprom's policies²¹



21. JSC Atomenergoprom is an organisation of ROSATOM; accordingly, ROSATOM's policies apply to JSC Atomenergoprom and its organisations (except for policies pertaining to the area of responsibility of the Accounting Department of Atomenergoprom). Responsibilities are allocated in accordance with the Contract for the Provision of Support Services to Joint-Stock Company Atomic Energy Power Corporation.

Sustainable products

As part of product line development in the industry, special emphasis is placed on environmental and climate performance of products and projects, value creation for end users and assessment of product solutions in terms of their alignment with sustainability priorities. More specifically, in order to enhance the sustainability of the product line, in 2022, ESG reporting requirements were incorporated into product strategies and strategic programmes.

The nuclear industry is one of the most knowledge-intensive and high-technology sectors. In addition to nuclear power, the Company is also developing other low-carbon products, including wind power generation, hydrogen energy technology, energy storage systems and digital solutions for the electric power industry. Nuclear technology also provides a basis for the development of solutions for nuclear medicine and isotope products, radiation processing technologies, environmental solutions, international logistics, etc.

As part of its focus on increasing the share of 'green' products in its product line, JSC Atomenergoprom monitors ESG performance across its key product areas. To do so, the Company has established an internal ESG certification procedure. In 2022, more than 20 product areas underwent certification, including small NPPs, wind power, the 'smart city', nuclear medicine, etc. In 2022, product areas that underwent internal sustainability certification and had their 'green' status confirmed accounted for about 40% of total revenue from new businesses.

2.3. MARKETS SERVED BY ATOMENERGOPROM

In 2022, JSC Atomenergoprom ranked:

- First in the world in terms of the number of NPP power units in the portfolio of foreign projects* (34 power units);
- First on the global uranium enrichment market (35%);
- Second in the world in terms of uranium production (14% of the market);
- Third on the global nuclear fuel market (17%).
- * Including the portfolio of ROSATOM.

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

Responsibility for the expansion of ROSATOM and JSC Atomenergoprom into new markets lies with the Director for Development and International Business of ROSATOM.

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.

GRI 2-6 Markets served by Atomenergoprom and value chains

In the reporting year, there were no changes in the value chain, including the supply chain.



Natural uranium market

Forecast for changes in uranium demand by 2030

According to UxC, in 2022, average spot market guotations for uranium increased by 42% to USD 49/lb of U_O_. The rise in market prices was driven by geopolitical tensions and continued uranium buying by financial investors. In April 2022, spot quotations reached USD 63.75/lb of U₂O₆ for the first time since the Fukushima nuclear disaster (11 March 2011). During the months that followed, amid limited demand from energy companies, quotations were driven primarily by demand from intermediaries and financial investors, whose activity was limited by the ability to raise financing.

Average annual spot market quotations for natural uranium, USD/lb of U₂O₂



Sources: input data from UxC²²; average values have been calculated by JSC Atomredmetzoloto.

In 2022, global reactor demand for uranium totalled 63,500 tonnes²³. At the same time, global demand taking into account commercial and strategic stockpiling not intended for current consumption is estimated at 74,300 tonnes.

The uranium market fundamentals remain favourable. In the medium and long term, demand for natural uranium is expected to increase due to the commissioning of new power units at NPPs in China, India and other countries. According to the base case forecast of the World Nuclear Association (WNA), global reactor demand for uranium will increase to 70,200 tonnes by 2025 and to 79,400 tonnes by 2030.

Natural uranium market overview

In 2022, global uranium production increased by 6% to 50,400 tonnes, with nine major companies, namely NAC Kazatomprom (Kazakhstan), CNNC and CGN (China), JSC Atomredmetzoloto and Uranium One (companies of JSC Atomenergoprom), Orano (France), Cameco (Canada), Navoiyuran State Enterprise (Uzbekistan) and BHP (Australia – UK) accounting for about 85% of global production.

NAC Kazatomprom has been the largest uranium mining company globally since 2010 (23% of global production in 2022). In 2022, ROSATOM ranked second in the world in terms of uranium production.

Supplies from secondary sources (inventories of energy companies and some states, repreparation of depleted uranium hexafluoride, reprocessed uranium, etc.) in 2022 were estimated at 24,000 tonnes of natural uranium equivalent.



According to the UxC forecast, in 2023, global uranium production will total 56,000 tonnes, while supply from secondary sources will total about 14,000 tonnes. Global production of natural uranium is expected to increase by 2030 due to rising demand. Supply from secondary sources will total about 7,000 tonnes of natural uranium equivalent in 2030.

Uranium conversion and enrichment market

Products and services offered on the market include uranium hexafluoride (UF_c), uranium conversion services, enriched uranium product and uranium enrichment services.

Forecast for changes in demand for uranium conversion services by 2030

According to the base case scenario of the World Nuclear Association, in the reporting year, global reactor demand for uranium conversion services totalled about 63,000 tonnes.

In 2022, average annual spot guotations on the North American and European markets rose by 65% and 68% respectively, while average annual long-term quotations increased by 34% and 35% respectively

The increase in guotations was caused mainly by market concerns over the availability of material, including given the limited conversion capacities of Western producers.

The development of nuclear power generation until 2030 will have a positive impact on the market for uranium conversion services. According to the base case scenario of the World Nuclear Association, global demand for conversion services may grow to 67,000 tonnes by 2025 and 76,000 tonnes by 2030.

Largest players on the natural uranium market in 2022

Source: company reports, UxC

^{22.} UxC, LLC (UxC) is an independent international company specialising in market analysis, research and forecasting covering the entire nuclear fuel cycle (https://www. uxc.com/).

^{23.} Hereinafter, data on the uranium market from a report by UxC (UMO Q1 2022) are used.

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



Forecast for changes in demand for uranium enrichment services by 2030

According to the World Nuclear Association, in 2022, global reactor demand for enrichment totalled about 52 million separative work units (SWU)²⁴. In 2022, average annual spot market quotations rose by 61%, while long-term quotations soared by 88%. Their growth was driven mainly by market concerns over the availability of enrichment services, including given the limited capacities of Western producers.

The development of nuclear power generation until 2030 will have a positive impact on the market for uranium enrichment services. According to the base case scenario of the World Nuclear Association, global demand for enrichment will grow to 55 million SWU by 2025 and 63 million SWU by 2030.

Average annual spot market quotations for enrichment services, USD/SWU



24. Report by the World Nuclear Association, 2021 (at a tails assay of 0.22%). ROSATOM estimates this figure at 55 million SWU at a tails assay of 0.18% (which is equivalent to 50 million SWU at a tails assay of 0.22%).

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), CNNC (China) and Converdyn (US).

The main players on the global market for uranium enrichment services include JSC Atomenergoprom (35% of the global market), URENCO (UK, Germany, Netherlands; 33%), Orano (France) and CNNC (China) (13% each). Together, they control more than 90% of the market. At present, all players use modern gas centrifuge technology for uranium enrichment.

Nuclear fuel fabrication market

According to the Company, in 2022, the global nuclear fuel market capacity totalled about 10,200 tonnes of heavy metal (tHM), with fuel for light-water and other reactors requiring uranium enrichment accounting for approximately 7,200 tHM (including about 1,200 tHM of fuel for water-cooled water-moderated power reactors (VVERs)) and fuel for heavy-water reactors accounting for approximately 3,000 tHM.

by 2030.

Nuclear Fuel (7%).

Shares of players on the nuclear fuel fabrication market, %



In the reporting year, Russian nuclear fuel fully met the demand of Russia and a number of partner countries, including Belarus, Armenia and some Central European countries, for reactor fuel. The Company also partially met the demand of Finland, India, China and a number of other countries for reactor fuel.

As the reactor fleet will be expanding, the demand for fabrication services may increase to 12,500 tHM

Global suppliers on the fabrication market include Westinghouse (with a market share of 22%), Framatome (AREVA until 2018, with a market share of 19%), JSC Atomenergoprom (17%), CNNC (13%) and Global

Entering new nuclear fuel markets

In 2022, the Company continued to take steps towards entering the market 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 2022, the Company continued the transition to the use of uranium/plutonium MOX fuel in the BN-800 reactor at power unit No. 4 of Belovarsk NPP. The formation of a core fully loaded with MOX fuel at the power unit will be completed in 2023. In addition, fuel for start-up core loading and for the first reloading of CFR-600. the first high-power fast neutron reactor currently under construction in China, was manufactured and shipped to the customer.

The Company continues to implement the Proryv (Breakthrough) Project. It involves building a fuel fabrication/refabrication module, which will produce mixed nitride uranium/plutonium fuel. In 2022, fuel assemblies with removable containers were loaded into the BN-600 reactor at Belovarsk NPP. They will enable the testing of nitride fuel up to design limits and materials testing using assemblies containing samples for advanced fast reactor cores. In addition, in 2022, the first MNUP fuel assemblies with BN-1200-sized fuel elements were produced, to be loaded for testing into the BN-600 reactor.

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

Power machine engineering market

Power machine engineering helps to ensure reliable electricity supply and thus meets a basic need of the modern economy.

In 2022, the Russian market saw a relative decline in industrial output across all segments of mechanical engineering. The Russian power machine engineering industry demonstrated a mixed performance across key product groups. In the steam turbine equipment segment, a downward trend continues. with production declining by 33.2²⁵ in 2022 following a 67% decrease in 2021. In the steam generation equipment segment, a 207% rise in production in 2021 was followed by a 68.6% decline in 2022. In the gas turbine equipment segment, output increased by 43.9% in 2022 following a 60% decrease in 2021. This was driven by the adaptation of the power machine engineering market after foreign producers had left Russia and unfriendly countries had imposed sanctions.

The Mechanical Engineering Division of JSC Atomenergoprom is one of the largest power machine engineering companies in Russia. In 2022, JSC Atomenergoprom increased its share on the Russian power machine engineering market in terms of revenue from 42% to 43.2%.

The core competence of the Mechanical Engineering Division is the supply of full sets of reactor and turbine island equipment for nuclear power plants. In 2022, equipment produced by the Division was used at 19% of power units globally. Enterprises forming part of the Mechanical Engineering Division produce reactor equipment for 39% of large power units under construction globally.

Given that foreign suppliers have left the Russian market, this provides JSC Atomenergoprom with additional opportunities to actively develop new businesses.

In recent years, key trends in the development of the global electricity market include heightened scrutiny of environmental aspects of the electric power industry and an increase in the share of zero-carbon power aeneration in the alobal energy mix. Countries seek to reduce the share of power plants using fossil fuels, such as coal and gas, and to develop renewable energy sources, such as solar and wind power plants, etc. Despite a surge in renewable power generation, its stability in the absence of expensive energy storage systems remains an unresolved issue. As a result, nuclear power generation is currently one of the most reliable, cheapest and most environmentally friendly sources of electricity. The International Energy Agency forecasts that by 2030, the global installed capacity of NPPs will reach 471 GW²⁶, which reflects steady growth of nuclear power generation.

In 2022, nuclear power accounted for about 10% of global electricity generation. According to the IAEA, in 13 states, more than a quarter of electricity demand is met by nuclear power generation. Countries with the largest share of nuclear power generation include France (69%), Slovakia (52%) and Belgium (47%).

Leading countries by the number of operating NPP power



According to the IAEA²⁷, as at 31 December 2022, 439 power reactors with a total capacity of 393.8 GW were in operation (including the suspended Japanese reactors). Another 57 reactors were under construction. In 2022, 35 power units of 10 NPPs and the floating thermal nuclear power plant were in operation in Russia, with their installed capacity totalling 29.6 GW. In 2022, JSC Atomenergoprom ranked second among nuclear power generation companies globally in terms of installed NPP capacity, surpassed only by the French EDF. Russia ranks fourth in the world in terms of the number of NPP power units in operation.

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 2022 totalled 6.1 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 leader in terms of the number of NPP construction projects.

NPP construction and operation market

^{26.} IEA World Energy Outlook 2022 (Stated Policies Scenario). 27. Power Reactor Information System (PRIS) developed by the IAEA (https://pris.iaea.org)

^{25.} Estimates based on data from the Federal State Statistics Service.

Overseas NPP servicing market

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

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

In the reporting year, the portfolio of power units serviced by the Company comprised 48 Russian-design NPP power units abroad.

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

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

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

JSC Atomenergoprom is exploring localisation opportunities in other regions of operation (Turkey, Egypt, Bangladesh, etc.) and plans to develop a line of NPP servicing products by 2030 (taking into account ROSATOM's projects).

For details, see the section 'International Business'.

Market for the decommissioning of NPPs and facilities posing nuclear and radiation hazards

By the end of 2022, about 210 power units had been shut down in the world. According to JSC Atomenergoprom's estimates, by 2030, the number of shut-down power units will reach 300 (the NPP construction activity peaked in the 1970s and 1980s, and in the 2030s the service life of many units will have reached 60 years). The service life of many of the NFC facilities supplying nuclear fuel to NPPs is also nearing its end.

The market for the decommissioning of facilities posing nuclear and radiation hazards is growing steadily (with an average CAGR of 7.3%); the potential market size is estimated at more than USD 200 billion.

The market growth is driven by the following factors:

- The continued trend towards NPP decommissioning in developed countries;
- The rising cost of projects;
- Stricter environmental requirements for projects and an increased focus on safety matters.

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

In 2022, JSC Atomenergoprom's operations on this market underwent major changes. Due to geopolitical constraints, the largest market segments (Europe, the US and Japan) became unavailable, and the size of the available market was reduced by more than 80%.

Despite the above constraints, JSC Atomenergoprom continues to develop this business area. Its geographical focus has shifted to the CIS, Latin American and Asian markets. The Company focuses on RAW management projects, given their significant synergy with decommissioning operations. As part of these efforts, the Company is taking steps to enhance its product offer by establishing an engineering centre specialising in the decommissioning of facilities posing nuclear and radiation hazards and RAW management. The key task of this entity will be the transfer of foreign decommissioning technologies.

In Russia, the Company is decommissioning power units No. 1, 2 and 3 of Novovoronezh NPP, power units No. 1 and 2 of Leningrad NPP, power units No. 1 and 2 of Beloyarsk NPPs, power unit No. 1 of Bilibino NPP and power unit No. 1 of Kursk NPP, which have been shut down. It is also participating in NPP decommissioning in a number of European countries and is decommissioning nuclear fuel cycle facilities, namely enrichment, conversion and fuel fabrication plants.

In 2022, JSC Atomenergoprom continued to promote cooperation in the back-end segment among the CIS countries. This involved developing and approving a RAW Management Strategy in the Republic of Belarus and preparing for NPP decommissioning in Armenia and Kazakhstan.

Electricity and capacity market in the Russian Federation

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

Nuclear power plants maintained their role in terms of meeting base load demand in the Unified Power System of Russia, with nuclear power generation reaching a new all-time high of 223.4 billion kWh in 2022 (as against 222.4 billion kWh in 2021). The increase in nuclear power generation was mainly driven by a reduced duration of scheduled repairs at power units. As a result, in the reporting year, the Company managed to remain a leader among power generation companies, with the share of nuclear power generation in the country's total electricity output (in the Unified Power System of Russia) totalling 19.9%. The Company's key goal remains to ensure safe and reliable operation of nuclear power plants and remain a leader in terms of its share in the country's energy mix.

In addition, JSC Atomenergoprom builds and operates wind power plants in Russia. The portfolio of wind power plants to be built by the Company by the end of 2027 totals 1.7 GW, with 780 MW already put into operation. In 2022, electricity output from the Company's WPPs totalled 1.9 billion kWh (2021: 1.2 billion kWh).

In early 2022, JSC Atomenergoprom became a major player on the thermal power market. As a result of the acquisition of PJSC Quadra – Power Generation, the total power generation capacity of thermal power plants (TPPs) managed by JSC Atomenergoprom exceeded 4 GW, while their heat generation capacity totalled about 19,800 Gcal/h. Power and heat generation at the TPPs totalled 16.2 billion kWh and 30 million Gcal respectively (2021: 3.3 billion kWh and 7.5 million Gcal respectively). The TPPs supplied power and heat to regions of the Siberian and Ural Federal Districts (including the Udmurt Republic, the Tomsk Region, the Zabaykalsky Territory, the Sverdlovsk, Chelyabinsk and Ulyanovsk Regions) and the Central Federal District (the Belgorod, Voronezh, Kursk, Lipetsk, Oryol, Smolensk, Tambov, Tula, Kaluga and Ryazan Regions).

In addition to NPP, TPP and WPP operation, JSC Atomenergoprom also sells electricity. In the reporting year, JSC Atom Energy Trade continued to operate as the power supplier of last resort in the Kursk, Tver, Smolensk and Murmansk Regions, while LLC REC continued to operate as the power supplier of last re-

For details, see the section 'Fuel Division'.

sort in the town of Zheleznogorsk (Kursk Region) and became a supplier of last resort in the Republic of Khakassia as from 1 September 2022, JSC Atom Energy Trade and LLC REC provide services to more than 60,000 legal entities and more than 2 million households in Russia.

In 2022, retail electricity sales by the branches and standalone divisions of JSC Atom Energy Trade and LLC REC totalled 16.8 billion kWh, up by 5% compared to 2021 (16.0 billion kWh).

For details, see the section 'Power Engineering Division'.

Wind power market

The global wind power market is growing steadily in terms of both capacity additions and investment activity. In 2021, wind power capacity increased by more than 92 GW, while in 2022, capacity additions exceeded 74 GW²⁸.

According to the most conservative estimates by the International Energy Agency, wind power capacity will increase from 0.93 TW in 2022 to 1.83 TW in 2030 and 3.56 TW by 2050²⁹. Wind power capacity additions may average 110 GW per year.

As part of the Russian programme to support renewable energy based on capacity supply agreements on the wholesale market, the capacity of onshore WPPs to be commissioned by the end of 2024 is expected to total 2.74 GW, with a further 3.9 GW to be commissioned between 2025 and the end of 2035. According to JSC Atomenergoprom's estimates, by 2035, the total installed capacity of onshore WPPs in Russia might reach 7 GW.

In 2022, the 60 MW Berestovskava WPP was put into operation and started to supply electricity on 1 January 2023. The construction of two WPPs with installed capacity totalling 220 MW (the Kuzminskaya WPP (160 MW) and stage 1 of the Trunovskaya WPP (60 MW) was started in the Stavropol Territory.

JSC Atomenergoprom's share on the Russian wind power market totals about 34%.

For details, see the section 'Business Diversification'.

Nuclear medicine market

In the reporting year, the global nuclear medicine market totalled ~ USD 13.2 billion and is expected to exceed USD 33 billion by 2030 (this figure refers to the total value of healthcare services provided globally).

The global market for nuclear medicine equipment totals USD 2.9 billion and is expected to reach USD 5.6 billion by 2030.

The volume of the Russian nuclear medicine market exceeds RUB 100 billion, and the market is expected to grow steadily until 2030 and reach approximately RUB 162 billion: according to JSC Atomenergoprom's forecasts, the growth rate will total up to 8–9% per year, given an increase in compulsory health insurance contributions. In the coming years, key growth drivers will continue to include the implementation of the Healthcare National Project, nuclear medicine procedures and high-technology healthcare services being prescribed more often, as well as the development of healthcare infrastructure and, more specifically, the construction of nuclear medicine centres specialising in radionuclide diagnostics and therapy. In a number of Russian regions, steps are being taken or plans have been developed to provide existing healthcare institutions with state-of-the-art nuclear medicine equipment for diagnostics and therapy.

The Company sees considerable potential for the development of nuclear medicine services for the general

BUSINESS STRATEGY

JSC Atomenergoprom is a major supplier of isotopes and radiopharmaceuticals for nuclear medicine in Russia. 30% of the world's reactor units producing medical radioisotopes are located in Russia. The Russian nuclear industry accounts for 25% to 50% of global radioisotope production (for some types of radioisotope products, its share totals 100%). The Company's long-term goal is to rank among the top five global suppliers of isotope products for medical applications, including brand-name radiopharmaceuticals and generic drugs.

processing technologies.

JSC Atomenergoprom also produces and actively upgrades medical equipment for diagnostics and therapy. By 2030, the Company plans to become a National Champion in a number of segments, including MRI equipment, 6 MeV and 18 MeV linear particle accelerators, cyclotron and radiochemistry facilities, SPECT scanners and brachytherapy equipment.

GRI 3-3 Waste management market

ROSATOM is supporting the development of an integrated system for the management of hazard class 1 and 2 waste in Russia. This initiative has been launched under the Infrastructure for the Management of Hazard Class 1 and 2 Waste Federal Project, which forms part of the Ecology National Project. Hazard class 1 and 2 waste includes 485 types of waste, such as mixtures of inorganic salts, oxides, hydroxides, acids (waste from the metals, manufacturing and mechanical engineering industries), mercury-containing waste (mercury-vapor lamps and mercury thermometers, as well as mercury-containing industrial waste). and waste containing organic components. About 350,000 tonnes of this waste is generated in the country every year; furthermore, experts predict that by 2030, hazard class 1 and 2 generation will reach 413,000 tonnes.

As part of the Infrastructure for the Management of Hazard Class 1 and 2 Waste Federal Project, ROSATOM and JSC Atomenergoprom are developing infrastructure for hazard class 1 and 2 waste processing, namely a network of environmental technology parks, which will be equipped with the best state-of-the-art safe technological solutions.

The Company, through JSC Rusatom Greenway, has started to build three modern industrial facilities (environmental technology parks). ROSATOM will build a total of seven modern industrial facilities (environmental technology parks), four of which will be built at chemical weapons destruction sites, while the remaining three are greenfield facilities. The environmental technology parks will have a total throughput of 350,000 tonnes of waste, which will help to address the national shortage of capacities for the processing of these classes of waste.

In fact, this will provide a resource base for a new circular economy in Russia. The design and selection of process lines is underpinned by the principle that recycling is a priority: two thirds of all waste will be recycled, and the resulting materials will be commercialised. The first two environmental technology parks in the Kurgan and Saratov Regions are scheduled to be put into operation by the end of 2023. By the end of 2024, the Company will launch environmental technology parks in the Kirov Region and the Udmurt Republic, as well as greenfield facilities in the Irkutsk, Tomsk and Nizhny Novgorod Region.

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-guality healthcare services to patients.

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

For details, see the section 'Business Diversification'.

For details, see the sections 'Business Diversification' and 'Safe Operation'.

^{28.} IRENA, Renewable capacity statistics 2023

^{29.} IEA, World Energy Outlook 2022.



PERFORMANCE IN THE INTERNATIONAL ARENA

GRI 2-1 3.1. INTERNATIONAL BUSINESS

Key results in 2022*:

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- The 10-year portfolio of overseas orders totalled USD 135.9 billion.
- The portfolio of overseas orders covering the entire life cycle totalled USD 200.8 billion.
- Revenue from overseas orders reached USD 11.76 billion (USD 8.9 billion in 2021).
- Projects were underway in more than 50 countries worldwide.
- * Including the portfolio and revenue of ROSATOM.

GRI 2-6 Promoting JSC Atomenergoprom's technologies on foreign markets

GRI 3-3 JSC Atomenergoprom (including ROSATOM's portfolio) 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 based on Russian technology).

In addition, JSC Atomenergoprom (including ROSATOM's portfolio) provides support throughout the life cycle of nuclear facilities (including both energy and non-energy facilities) by supplying the global market with the full range of products and services in the front-end and back-end stages of the nuclear fuel cycle (NFC), as well as providing services related to the maintenance and modernisation of such facilities. In 2022, JSC Atomenergoprom confirmed its status as a leader on the nuclear fuel cycle product market.

JSC Atomenergoprom takes systematic steps to promote small nuclear power plants; given heightened interest from customers in the energy market, this is a crucial focus area for the Company. JSC Atomenergoprom's capabilities and the successful implementation of the project to build the Akademik Lomonosov floating thermal nuclear power plant (FTNPP), which simultaneously supplies both heat and power to the town of Pevek in Chukotka, enable the Company to engage in a meaningful dialogue with overseas partners. For instance, in November, documents were signed on a joint pre-feasibility study for small NPP construction projects in Myanmar and Kyrgyzstan.

GRI 2-28 JSC Atomenergoprom attaches special importance to cooperation with foreign organisations (nonprofit organisations, including associations, initiatives, councils, etc.). In 2022, the Company (including ROSATOM's portfolio) had business relationships with more than 30 foreign organisations in 16 countries worldwide. The World Nuclear Association (WNA) remains a key partner of the Company. Representatives of the Company and its organisations took part in the key WNA events, as well as its working groups and research initiatives.

NPP construction abroad

At year-end 2022, ROSATOM's portfolio of overseas NPP construction projects (including JSC Atomenergoprom's portfolio) included 34 power units in 11 countries worldwide, with 23 power units in eight countries at the construction stage (including the largest overseas nuclear construction project: Akkuyu NPP in Turkey; the project is being implemented by JSC Rusatom Energy International, an organisation managed by JSC Atomenergoprom).

All overseas NPP construction projects are on track; the only exception is the Hanhikivi 1 NPP project in Finland, which has been unilaterally terminated by the Finnish customer for political reasons. No other overseas construction project has been suspended.

requirements.

NPP servicing abroad

JSC Atomenergoprom provides maintenance services for 48 Russian-design power units abroad that are currently in operation or at the design/construction stage. Its product portfolio targeted at international markets includes a wide range of work and services covering the entire NPP life cycle.

In the reporting year, the Company provided support for scheduled preventive maintenance at Kudankulam NPP (India), Tianwan NPP (China), Kozloduy NPP (Bulgaria) and the Armenian NPP. It also successfully carried out the first scheduled repairs at power unit No. 1 of the Belarusian NPP.

Over 940 members of operating and maintenance personnel at foreign NPPs underwent training as part of long-term and short-term training programmes in 2022, including at Rooppur NPP (Bangladesh), Akkuyu NPP (Turkey), El Dabaa NPP (Egypt) and Paks II NPP (Hungary).

The Company provided assistance to foreign customers in building and improving nuclear infrastructure in Egypt, Bolivia, Bangladesh and Namibia.

Reactor control systems were upgraded at power unit No. 6 of Kozloduy NPP (Bulgaria), and the relevant equipment was put into operation.

to Tianwan NPP (China).

Full-scale and analytical simulators for the training centres at Akkuyu NPP (Turkey) and Rooppur NPP (Bangladesh) were delivered and put into operation.

Export of uranium products and natural uranium enrichment services

JSC TENEX is the Company's main organisation promoting uranium conversion and enrichment services on the global market and supplying enriched uranium for power and research reactors. In 2022, JSC TENEX remained one of the world's leading suppliers of nuclear fuel cycle front-end products.

Russian-design nuclear reactors that are currently under construction fully meet international safety

A long-term contract was signed for the supply of spare parts and equipment for the reactor coolant pump

All obligations under existing contracts in the reporting year were fulfilled in full, with uranium products supplied to 43 customers in 15 countries. Feedback received as part of customer satisfaction surveys and the findings of supplier audits conducted by customers indicate that product quality, communications and supply chain resilience meet customer expectations. The customer-centric approach adopted by the Company and the importance that it attaches to its partners' offers provide a foundation for constructive long-term cooperation. The 10-year portfolio of orders for uranium products (as at 31 December 2022) remained at the same level as in previous years.

In the reporting year, JSC TENEX concluded 15 new contracts for the supply of uranium products with 11 customers from eight countries, including addenda to existing contracts.

Uranium mining abroad

In 2022, uranium mining enterprises of Uranium One Group produced about 4,500 tonnes of uranium, which enabled JSC Atomenergoprom to remain a leading producer of natural uranium.

Uranium mining by Uranium One enterprises, tonnes

Republic of Kazakhstan



The Company plans to develop its mineral resource base and continuously improve the economics of its natural uranium mining projects.

Nuclear fuel export

In 2022, the Company continued to fulfil its existing contractual obligations related to nuclear fuel supply, despite the transportation and logistics challenges facing it.

The share of JSC Atomenergoprom on the global nuclear fuel fabrication market totalled 17% in 2022.

In the reporting year, Russian nuclear fuel fully met the demand of Russia, as well as a number of partner countries, including Armenia and Belarus, for reactor fuel. Nuclear fuel produced by JSC Atomenergoprom is also used in reactors at NPPs in India, China and a number of other countries.

Despite existing external factors, all deliveries of nuclear products were made in full and on time. In addition, contract documents were signed with the Indian party, and the first batch of a new type of fuel, TVS-2M, was supplied to power unit No. 1 of Kudankulam NPP. Fuel for start-up core loading and for the

first reloading of the CFR-600 high-power fast neutron reactor, which is currently under construction in China, was manufactured and shipped to the customer. A package of tender documentation was developed for the supply of fuel for the first NPP in the Kingdom of Saudi Arabia under both an EPC contract and a separate fuel supply agreement.

customs clearance mechanisms.

In the reporting year, a contract was signed with the Uzbek customer for the supply of a pilot batch of advanced fuel for a research reactor in order to conduct reactor tests in Uzbekistan, to be followed by the delivery of a commercial batch.

NFC products were supplied and contracts were concluded for additional volumes and an expanded product range, including uranium components, as well as aluminium alloy and aluminium powder products, as a follow-up to the long-term framework contract for the supply of nuclear fuel components for the ETRR-2 research reactor to Egypt, which was concluded in 2020 by PJSC NCCP and the Egyptian Atomic Energy Authority (EAEA).

As part of the Balanced NFC product line, the Company developed the design of the fifth-generation fuel bundle, TVS-5, for VVER reactors, which underwent a full range of pre-irradiation tests. These confirmed the reliability of the design and the possibility of its use in VVER-1000/1200 reactors. The special features of the TVS-5 design will help to completely eliminate manual labour in nuclear fuel production.

The programme of reactor tests for new materials for accident tolerant fuel was expanded. The technology for the production of fuel pellets from uranium disilicide was developed. Reactor tests of new VVER- and PWR-sized fuel elements with uranium silicide fuel were started in the MIR research reactor at JSC SSC RIAR.

New products for international markets

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

In the reporting year, JSC Atomenergoprom also continued active work on non-energy applications of nuclear technology. The Company continued to implement one of its key projects focused on new products, namely the construction of the Nuclear Research and Technology Centre in Bolivia, the world's highest-altitude nuclear facility. As part of the construction of the Centre, in 2022, stage 1 and 2 facilities, namely the Cyclotron Radiopharmacy Preclinical Complex (CRPC) and the Multipurpose Irradiation Centre, started pilot operation, and the necessary permits were obtained from the Bolivian healthcare regulator for the medical use of radiopharmaceuticals produced at the CPRC. In 2022, a licence was obtained for the construction of stage 4, which includes reactor and engineering facilities, and the required degree of completion of the relevant facilities was achieved.

Key objectives for 2023 include performing construction and installation work at stage 4 facilities, including the installation of main process equipment for Bolivia's first nuclear research reactor.

The Company continues to implement intergovernmental agreements signed earlier on cooperation in the construction of NRTCs in Rwanda and Vietnam, with a focus on preparing for the development of feasibility studies for these projects.

Republic of Belarus.

The reactor core mock-up was delivered to Akkuyu NPP in Turkey using new document preparation and

Consultations are underway to negotiate an intergovernmental agreement for NRTC construction in the

Jointly with foreign partners, the Company is examining options for the establishment of production and sales hubs for the construction and subsequent operation of radiopharmaceuticals plants and nuclear medicine centres.

Foreign customers show strong interest in projects to build nuclear medicine centres and multipurpose irradiation centres, which are widely used in healthcare and agriculture. Opportunities are being discussed for the implementation of such projects in Africa, Asia and Latin America, and a number of bilateral project documents have been signed.

Supply of isotope products

In 2022, JSC Isotope Regional Alliance (a company managed by JSC Atomenergoprom and acting as ROSATOM's integrator for the exports of isotope products) continued to supply isotope products under existing contracts and concluded new contracts, despite external and internal restrictions. Considerable efforts were made to redesign logistics, supply chains and payment arrangements. Preparations continued for launching Russian radiopharmaceuticals compliant with international GMP standards on the foreign market.

Promoting life cycle back-end services

The Company is promoting the Balanced NFC, an integrated product for the back end of the nuclear fuel cycle (NFC), on the global market. This is an offer incorporating certain elements of a closed NFC and enabling effective recycling of regenerated nuclear materials and a significant decrease in the volume and radioactivity level of radioactive waste sent for near-surface or medium-depth disposal. This is achieved through SNF processing and high-level waste fractionation. In addition, in 2022:

- Russia and Belarus concluded an intergovernmental agreement on cooperation in SNF management. which is a necessary prerequisite for concluding a contract for the management of SNF from the Belarusian NPP:
- A contract was concluded and transportation packages were delivered for the management of SNF from Kudankulam NPP;
- The pilot TUK-137T.R transportation package was manufactured; this is new-generation packaging required for the implementation of the Balanced NFC concept.

Nuclear medicine

In 2022, JSC Atomenergoprom continued to develop its capabilities in the sphere of medicine, produce and supply medical isotopes and radiopharmaceuticals, and develop medical equipment for diagnostics and therapy. For instance, following a tender won by JSC National Technical Physics and Automation Research Institute (NIITFA, an organisation of JSC Atomenergoprom producing medical equipment), a contract was signed with a Bengal partner to upgrade a gamma radiation facility and supply cobalt-60. Distribution contracts were concluded for the supply of Russian medical equipment to Mexico and Belarus.

Plans for 2023

Plans for 2023 include the commissioning of power unit No. 2 of the Belarusian NPP.

As part of the Akkuyu NPP construction project in Turkey and the Rooppur NPP construction project in Bangladesh, in 2023, the Company plans to deliver fresh nuclear fuel to the construction sites.

As part of the El Dabaa NPP construction project, the Company expects to obtain a licence for the construction of power unit No. 3 and subsequently start the concreting of the foundation slab of the reactor building at power unit No. 3.

first nuclear research reactor.

Given that the customers' interest in the energy market is shifting towards flexible solutions (in terms of both the power generation volume and the amount of funding), the most important area of focus for the Company in 2023 will be the promotion of small nuclear power plants. Pre-feasibility studies in Myanmar and Kyrgyzstan are to be completed. In 2023, the Company plans to agree the Technical Configuration of the NPP in India with the Indian party and to hand over the pre-feasibility study for small NPPs. JSC Atomenergoprom plans to consistently diversify its product offer and launch new products on new markets. In 2023, the Company plans to continue to expand the footprint of its isotope business abroad. It also plans to be more active on foreign markets in the wind power segment and to leverage existing capabilities in the Russian Federation. Special emphasis will be placed on the development of projects in the field of nuclear medicine and energy storage systems, given the considerable potential of these market segments.





As part of the NRTC construction project in Bolivia, the Company plans to continue construction and installation operations at stage 4 facilities, including the installation of main process equipment for Bolivia's

PERFORMANCE OF DIVISIONS

116,113 PERSONS AVERAGE HEADCOUNT IN THE DIVISIONS



4.1. MINING DIVISION

Key results in 2022:

- Revenue under Russian Accounting Standards (RAS) increased by RUB 1.5 billion (RUB 24.7 billion in 2022).
- The development of the Kolichkanskove deposit in Burvatia began ahead of schedule.
- The first ore was recovered from deep areas of the Yubileynove deposit.
- Positive opinions were obtained from Glavgosexpertiza of Russia for projects to develop the Khokhlovskoye uranium deposit and the Dybrynskoye deposit, as well as for the construction of a mining and processing plant and port facilities at the Pavlovskoye lead and zinc deposit.

The Mining Division (hereinafter referred to as the Division; its holding company is JSC Atomredmetzoloto) is one of the largest natural uranium producers in the world. The Division manages Russian uranium mining assets in the Zabaykalsky Territory (PJSC PIMCU), the Republic of Buryatia (JSC Khiagda) and the Kurgan Region (JSC Dalur).

In addition to uranium mining, the Division is actively developing non-uranium businesses, including scandium mining as a by-product (JSC Dalur), brown coal mining (PJSC PIMCU), the design of an integrated production facility at the Pavlovskove lead and zinc deposit, gold mining projects (JSC Elkon MMP), etc.

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



Operating results

Indicator	2020	2021	2022	Change analysis
Uranium production, tonnes	2,846	2,635	2,508	The decrease in output was caused by a high level of depletion of existing mines and deposits.
Uranium resources (Russian assets), '000 tonnes	509.4	506.4	503.7	The decrease was due to the annual depletion of economic uranium reserves during mining.
Average headcount, persons	7,246	7,325	7,689	The growth was driven by the expansion of mining, processing and auxiliary infrastructure of uranium mining enterprises, expansion of the scope of external projects of JSC Elkon Mining and Metallurgical Plant, as well as drilling, construction and installation operations at JSC RUSBURMASH.
LTIFR	0	0.22	0.21	The changes were insignificant.
Tax payments (actual), RUB billion ³⁰	7.6	6.4	7.2	The growth of tax payments was due to an increase in the Division's revenue and the payroll fund across core production assets.
Consolidated revenue (RAS), RUB billion	20.4	23.2	24.7	Revenue growth was driven by business diversification.

Key operating results

target.

PJSC PIMCU:

- Mine No. 8 was developed;
- were purchased;

Mine No. 6:

JSC Dalur:

- Khokhlovskoye uranium deposit;

In 2022, the enterprises of the Mining Division produced 2,508 tonnes of uranium, which is 8% above the

The enterprise continued to develop the existing mines: the Yuzhny site of the Yubileynoye deposit of

- Two new high-performance ARAMINE diesel load-haul-dump (LHD) machines and two new drilling rigs

- The programme for the third stage of renovation of the Sredneye tailings dump was completed.

- Demothballing of facilities at Mine No. 6 was started; more than 2 million m³ of water was pumped out; work is underway to achieve the design targets for the quality of treated mine water;

Construction of exploration and development shaft 19-RESh and the hoist building was started;

- The project focused on the technical upgrade of shaft 20V was submitted for industry expert review.

- The construction of phase one facilities was completed at the pilot site of the Dobrovolnoye deposit; - A positive opinion was obtained from FAI Glavgosexpertiza of Russia for the project to develop the

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 The construction of stage one start-up facilities for the development of the Eastern ore body of the Khokhlovskove deposit was completed: the 'digital' uranium mining technology (Smart ISL Mine) was rolled out across the entire ore body.

JSC Khiaqda:

- The construction of stage one mining units was completed at the Kolichkanskove deposit;
- The development of the Dybrynskove deposit was started; the construction of phase one infrastructure facilities was completed:
- The construction of field facilities was completed at the Vershinnoye deposit.

JSC RUSBURMASH:

- The enterprise continued to enhance construction capabilities at the construction sites of JSC Dalur and JSC Khiadda:
- As part of the fulfilment an industry-wide RPS order, the amount of time required to prepare for the mining of ore bodies at uranium deposits was reduced three-fold;
- The fleet of drilling rigs for the construction of process wells in ISL enterprises was expanded. including as part of import substitution.

JSC VNIPIPT:

- The enterprise received the status of the 2022 BIM Leader;
- A positive opinion was obtained from FAI Glavgosexpertiza of Russia for the Pavlovskoye project, which makes it possible to begin the expansion of Russia's footprint in the Arctic.

Contribution to the technological sovereignty of the Russian Federation

The Mining Division is the successor to the world's largest network of raw materials enterprises in the nuclear industry created in the Soviet Union. During its recent history, ARMZ has not only retained the status of a world-class uranium mining enterprise, but has also laid the foundation for the development of a new high-technology industry in Russia, namely the production of rare and rare-earth metals. The current focus of ARMZ on the production of scandium. titanium and zirconium is only the first step in a long journey towards ensuring the self-sufficiency of the Russian Federation in raw materials and technologies. JSC Atomredmetzoloto is aware of the importance and complexity of the tasks facing it and is actively working to improve the quality of its own resource base and increase the efficiency of production processes.

The development of production of rare and rareearth metals (hereinafter referred to as RMs and REMs) is of critical importance for meeting the needs of high-technology industries in the Russian Federation. The key priority for the development of the industry is to replace imports, develop technologies and establish integrated production operations based on its own mineral resource base. To achieve this, a Road Map for the Development of the Technology for New Materials and Substances High-Technology Area has been drafted, which includes a separate product area, Rare and Rare-Earth Metals. In accordance with the Road Map, it is intended that the share of imported products in total consumption in the Russian Federation will be reduced to zero by 2030.

In order to achieve the goals of developing the RM and REM product area, supplying resources for the production of flagship products and addressing gaps in the process chains for the manufacture of products based on titanium, zirconium, REM oxides, lithium, niobium, tantalum and scandium, the Division is implementing the following projects:

- Kolmozerskove lithium deposit in the Murmansk Region:
- (ilmenite. rutile):

Plans for 2023

The main objective of the Division in 2023 is to ensure that the uranium production programme is 100% fulfilled. The Division will continue to expand the use of in-situ leaching, which is the most effective mining technique. Plans include completing the construction of pilot site facilities at the Dobrovolnove deposit. The Division will continue the construction of facilities at the Khokhlovskoye deposit, begin to design facilities for the Verkhne-Uksyanskoye deposit (JSC Dalur) and start uranium mining at the Dybrynskoye deposit (JSC Khiagda).

of facilities at site 20V.

As the Krasnokamensk CHPP has become a subsidiary of the Mining Division, ensuring the reliable and safe operation of energy facilities will become one of the top priorities of PJSC PIMCU.

scheduled for 2023.

As part of new business development, in 2023, the Division plans to move to the industrial stage of development of the Severnoye deposit, which will result in a significant increase in gold production. Reserves are expected to be confirmed and entered in the register by the State Reserves Commission.

An important milestone in the development of the rare and rare-earth metals business in 2023 will be participation in the auction for mineral rights over the Kolmozerskove deposit in the Murmansk Region. In 2022, the deposit formed part of the unallocated fund of the Ministry of Natural Resources and Environment of the Russian Federation. The development of this deposit will provide the Russian Federation with its own source of lithium feedstock. While there are three operating enterprises processing lithium feedstock, Russia does not have its own operating lithium mines and imports all lithium feedstock.

An important step towards developing an in-house technological solution for producing individual REM oxides will be the validation of design performance of a pilot REM separation plant and of the guality of the finished product as part of the Phosphogypsum project in 2023. The next stage will involve the development of a semiindustrial plant to ramp up REM production.

Production ramp-up to target capacity in the Tugansk Ore Mining and Processing Enterprise in 2023 will provide Russian producers with a domestic source of titanium and zirconium and will make it possible to validate design performance.

The implementation of new projects in the mining industry and related sectors will drive the growth of the Division's business and enhance its long-term social and financial sustainability.

Lithium in the Russian Federation: a project to produce lithium carbonate/hydroxide at the

 Phosphogypsum project: the establishment of a facility for the production of REMs and gypsum products from phosphogypsum, including individual REM oxides;

 Titanium project: the establishment of a mining and processing plant for the processing of ilmenitezircon sands from the Tuganskove deposit in the Tomsk Region to produce titanium concentrates

- Scandium project: the establishment of a facility for the production of scandium oxide and aluminium-scandium alloy as by-products at the industrial site of JSC Dalur.

The Division plans to continue construction at Mine No. 6 of PJSC PIMCU; this includes reaching the design capacity and meeting the guality target for the pumping out of mine water, and starting the construction

The preparation of a pre-feasibility study for the development of the Elkon Mining and Processing Plant is

4.2. FUEL DIVISION

Key results in 2022:

- Consolidated revenue totalled RUB 271 billion, up 14.9% year on year.
- Fuel for the CFR-600 reactor (China), which is under construction, was manufactured and shipped.
- Delivery of components for the BREST-OD-300 reactor vessel in Seversk was started.
- A contract was signed for the supply of modified fuel for the VVR-SM research reactor (Uzbekistan).
- The construction of a lithium-ion battery factory was started in the Kaliningrad Region.

TVEL Fuel Company (hereinafter referred to as TVEL Fuel Company, the Company or the Division) is one of the world's largest nuclear fuel producers and the only supplier of nuclear fuel for all Russian NPPs, naval propulsion and research reactors in Russia. Fuel produced by TVEL is used at NPPs in 15 countries, meaning that one in every six power reactors worldwide runs on this fuel.

The Company consolidates the assets of the Fuel Division, which comprises enterprises specialising in gas centrifuge production, uranium enrichment and nuclear fuel fabrication, as well as research and design organisations.

The Division is actively developing new businesses: metals production and energy storage systems, the chemical industry and 3D printing technologies. TVEL Fuel Company comprises industry integrators specialising in the decommissioning of facilities posing nuclear and radiation hazards and in energy storage systems.

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. TVEL Fuel Company has developed and supplies PWR fuel assemblies designed in-house, TVS-Kvadrat. It has globally unique capabilities for the production of fuel for fast neutron reactors: uranium fuel for the BN-600 and CFR-600 reactors and MOX fuel for the BN-800 reactor. In addition, pilot fuel assemblies with mixed nitride uranium-plutonium (MNUP) fuel, which is being developed by the Division for the innovative BREST-OD-300 reactor, are currently being tested in the BN-600 reactor (Belovarsk NPP). The Division's enterprises also fabricate nuclear fuel and its components for Russian- and foreign-design research reactors around the world.

With enterprises located in 10 regions of the Russian Federation, TVEL Fuel Company is able to effectively engage with its partners across a wide range of issues and business areas. The social environment in the Company's regions of operation is influenced by the fact that some of its production facilities are based in closed administrative and territorial formations (CATFs): Seversk, Novouralsk and Zelenogorsk, and in the single-industry town of Glazov. These enterprises play a central role in the local economy and are major taxpayers.

Operating	results
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Indicator	2020	2021	2022	Comments
Consolidated revenue, RUB billion	208.7	235.7	271.0	The growth was due to changes in volumes, including an increase in overseas orders, changes in the structure of orders, as well as a rise in prices for products sold by the Division and changes in its scope of consolidation.
LTIFR	0.02	0.05	0.09	The change was due to an increase in the number of minor accidents.
Environmental costs, RUB million	1,989.1	2,345.8	2,366.8	The change was insignificant.
Average headcount, persons	21,835	21,841	23,382	The change was due to the hiring of personnel to support production ramp-up, including new non-nuclear businesses, and changes in the scope of consolidation.
Tax payments (actual), RUB million ³¹	15,961	15,072	16,116	The increase was related to changes in the data collection format (breakdown by budget level).

Contribution to the technological sovereignty of the Russian Federation

The Division's enterprises contribute to the technological sovereignty of the Russian Federation in a number of areas, including metals production, special chemicals, energy storage systems, hydrogen energy, etc.

Metals production

- The first batch of bioceramic dental implants has been delivered in order to register the medical product and launch it on the Russian market;
- Serial batches of medical titanium bars and wire have been shipped to key domestic manufacturers of medical implantable products. These bars have been used to produce implants for osteosynthesis, maxillofacial surgery and products for the arthroplasty of large human joints;
- A new high-performance design of calcium injection wire has undergone industrial tests; the wire is supplied in batches to Russian metals enterprises;
- The production of a new range of injection wire for the iron and steel industry based on ferrotitanium for steel microalloying has been set up;
- Process parameters have been tested for the machining of rare-earth magnets and the application of a multilayer protective coating on them; a pilot batch has been manufactured, and samples of finished products have been sent for the required examination and testing. Permanent rare-earth magnets are used primarily in wind power generation and electric vehicles.

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- The range of titanium products for shipbuilding and the aircraft industry has been expanded;

31. Data for 2021 have been recalculated due to changes in the data collection format (breakdown by budget level).

Special chemicals

A pilot plant for the production of battery-grade lithium hydroxide was launched at JSC Angarsk Electrolvsis Chemical Plant in 2021. In 2022, the first shipments of product samples were initiated. In the future. the Company plans to expand its sales footprint; at the moment, work is underway to set up large-scale production.

Energy storage systems

In October 2022, the Company began the construction of Russia's first gigafactory designed using state-ofthe-art technologies in the Kaliningrad Region. The enterprise will start manufacturing world-class products. namely lithium-ion batteries (cells) from which battery modules will be assembled. This will be the country's largest factory of this type: it will meet the demand of Russian electric vehicle producers for lithium-ion traction batteries and will also produce stationary energy storage systems for the power grid and for industrial enterprises. The first stage of the 'gigafactory' will have a capacity of 4 GWh per year, supplying lithium-ion batteries for up to 50,000 EVs. If demand for the products is confirmed, the second and third stages of the factory may be commissioned.

In December 2022, a new assembly facility for lithium-ion energy storage systems was opened at the site of the Moscow Polymetal Plant (JSC MZP, an enterprise of the Division). The first samples assembled at the site were traction batteries for trolleybuses with an extended off-wire range designed to be used on intra-city routes in Saint Petersburg.

JSC MZP has set up mass production of batteries for electric vehicles and stationary energy storage systems. The capacity of the new production facility is 10 times higher than that of the pilot production site established in 2021. The annual output will total up to 150 MWh of batteries for stationary systems (the total capacity of manufactured devices) or about 2,000 traction batteries for electric vehicles.

Digital products

The Fuel Division is working to fulfil the national task of replacing imported software and equipment for the Russian industry by supplying digital products to the market, as well as by making nuclear industry digitisation expertise available to manufacturing companies. The Division is developing four product areas: digital engineering, predictive analytics, robotisation and automation in enterprises, and telecommunications equipment.

In 2022, two digital products developed in the Division were included in the Unified Register of Russian Computer Software and Databases:

- The AtomMind information system for predicting the quality of products and the state of equipment: this is an industry digitisation platform that provides predictive analytics tools for efficient equipment maintenance and repairs and for product quality assurance;
- Atombot.Procurement: the first digital product for procurement automation based on artificial intelligence and the use of software robots, which significantly increase the efficiency of procurement documentation management.

LLC T-COM (a company of the Fuel Division) has launched a workshop for the SKD assembly of telecommunications equipment at the site of JSC MZP. The production of more than 70 models of managed switches has been set up; the switches can be used for building or upgrading any segment of telecommunication networks. The company produces equipment using Russian software which is included in the register of domestic software. Key consumers are industrial, energy, telecommunications and nuclear industry enterprises, as well as research institutes, educational and healthcare institutions, etc. In less than a year, the partner network of LLC T-COM has grown to 140 companies.

Customers for the Division's digital products are the largest players in the mechanical engineering, energy, metals, oil and gas, mining and other industries.

Plans for 2023

Nuclear fuel cycle:

- Rooppur NPP (Bangladesh):
- Rostov NPP
- Russian NPPs:
- at JSC Chepetsk Mechanical Plant;

Energy storage systems:

in the Technopolis park.

Digital products:

Metals production:

- To expand calcium injection wire production capacities;

- To manufacture and supply fuel for the initial loading of the first power units of Akkuyu NPP (Turkey) and

- To complete the first cycle and start the second cycle of pilot operation of accident tolerant fuel (ATF) at

- To manufacture experimental fifth-generation fuel assemblies (TVS-5) and deliver them to one of the

To build an industrial plant for applying chromium coatings on zirconium alloy cladding of fuel elements

To develop optimised cores for the RITM-200M reactor used at floating power units;

To manufacture MOX fuel assemblies containing minor actinides for the BN-800 reactor.

To open a new RENERA assembly site for the production of energy storage systems

- To launch the AtomReverse product on the market. This is a digital service that combines engineering solutions for replicating and optimising equipment and its components. The product is intended for a wide range of Russian industrial enterprises from various sectors that operate sophisticated imported equipment and have encountered difficulties in upgrading, repairing and maintaining it.

 To launch implantable products for osteosynthesis, prosthetic implants for the arthroplasty of large human joints and high-technology surgical instruments on the Russian market;

To develop new types of conductor products based on copper-niobium and other alloys.

4.3. MECHANICAL ENGINEERING DIVISION

Key results in 2022:

- Mechanical engineering products were delivered to 18 nuclear power plants.
- Consolidated revenue reached RUB 115 billion.
- The Division's share in the Russian power machine engineering industry increased to 43.2%.
- The RITM-200 reactor unit on the Ural nuclear icebreaker reached first criticality ahead of schedule.
- The Division supplied 85% of equipment for the first power unit of Akkuyu NPP (Turkey).

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

The Division includes engineering and design centres, major power machine engineering enterprises and smelters, as well as research and materials science organisations in Russia, the CIS and the European Union.

The Division's enterprises have supplied mechanical engineering products to 52 nuclear power plants in Russia, Europe and Asia.

JSC Atomenergomash leverages its expertise acquired over the years in the development and production of equipment for the nuclear power industry and is successfully developing adjacent business areas at an accelerating pace. The Division offers a range of solutions for the manufacture and supply of equipment for the nuclear and thermal power industries, shipbuilding, the oil and gas industry, and the special steel market. Extensive production and technological capabilities of the Division's enterprises and control over the entire production chain enable the Division to supply its customers with high-quality reliable equipment. The Division has well-established manufacturing operations, which enables it to effectively participate in NPP construction projects and provide maintenance and upgrade services.

Equipment produced by JSC Atomenergomash is used at all Russian-design NPPs.

The Division is the chief designer and single-source supplier of all marine reactor units for the Arktika, Sibir and Ural multipurpose nuclear icebreakers (RITM-200 reactor units), which are rightly considered the largest.

Technological advantages over competitors in the floating small NPP segment are underpinned by the availability of reference solutions for reactor unis, marine solutions, production capacities and sustainable cooperation and are now fully leveraged in the construction of icebreakers.

In addition, JSC Atomenergomash manufactures high-performance equipment for the Russian oil and gas industry. The Division's enterprises have a proven track record in the design and manufacture of equipment for the thermal power industry. As part of the Clean Country Federal Project, the Division has become the main producer of key process equipment for waste-to-energy plants.

Operating results



Delivery of mechanical engineering products, number of NPPs

Share in the Russian power machine engineering industry, %

Consolidated revenue, RUB billion

Average headcount, persons

LTIFR³²

Tax payments (actual), RUB billion

Charity expenses, RUB million

Occupational health and safety costs, RUB million

Key operating results

JSC Atomenergomash has extensive capabilities for equipment manufacture and technologies for various sectors of the domestic industry. In addition to nuclear engineering, the Company contributes to ensuring reliable supplies of equipment for energy projects by providing national power machine engineering capabilities. The Division has smooth-running fully integrated production facilities for the manufacture of largesized equipment for the gas, oil, chemical, metals and thermal power industries.

NPP turbine islands

The Division is developing its capabilities in the design of turbine islands with Arabelle turbines and the design of licensed equipment that forms part of the turbine islands. The Company adapts the documentation of foreign suppliers to align it with Russian standards and assists industry enterprises in organising the manufacture of licensed equipment.

2020	2021	2022	Comments
19	16	18	Products are delivered for NPP construction projects and for the maintenance and supply of equipment and spare parts for operating units.
42	42.2	43.2	The nuclear power industry is highly resilient to negative impacts. An additional factor enabling the Division to strengthen its position is the development of new businesses and the acquisition of new assets.
83	106	115	Revenue growth was driven by increased supply of products for NPP construction projects and the development of new non-nuclear businesses.
17,978	18,455	21,490	The increase was driven by production ramp-up as part of NPP construction projects and the development of new non-nuclear businesses.
0.07	0.07	0.19	The increase was due to the expansion of the scope of consolidation and a 25% increase in the headcount. These employees are undergoing safety onboarding supported by the implementation of the Division's internal regulations.
7.6	8.4	9.3	The increase in the amount of VAT accrued and paid to the budget was due to revenue growth and the acquisition of new assets.
85	92.7	110.1	The change was due to the fact that charity spending is targeted in nature; accordingly, the list of beneficiaries and the list of charitable activities vary from year to year.
535	466.8	891	The change was due to the frequency of special assessments of working conditions and training in occupational safety and health.

The Division has adopted unique technologies for mechanical assembly of equipment for the turbine island with VVER-1200 reactors for Akkuvu NPP (Turkev).

The following technologies have been developed and introduced as part of project implementation:

- Equipment manufacture for a low-speed steam turbine island for NPPs with VVER-1200 and VVER-TOI reactors:
- Equipment manufacture for a high-speed steam turbine island for NPPs with VVER-1000 and VVER-1200 reactors, including unique technologies for the drilling of deep holes in MSR³³, HPH³⁴ and LPH³⁵ vessels and for the press-fitting of heat exchange tubes into them:
- Manufacture of MSRs with cross-fin tubes.

Technologies under development include: equipment manufacture for the turbine island for the pilot BREST-OD-300 unit with a lead-cooled fast neutron reactor, as well as for the BN-1200 unit with a sodium-cooled fast neutron reactor, including unique technologies for the press-fitting of heat exchange tubes into reactor vessels with a high-pressure liquid jet.

Overlay welding machine

The calculation that has helped to validate the 'leak-before-break' (LBB) concept by eliminating the intermediate weld at the junction of the main coolant line (MCL) and the reactor coolant pump (RCP) has been made. The application of this approach in design and the selection of materials ensures that a component with a through-wall crack will not be completely destroyed. An existing stable leak in a component can be detected well before the crack becomes critical in terms of instability.

The spherical body of the RCP is to be made with internal weld overlay cladding. The switch has been necessitated by the introduction of requirements for the application of the LBB concept in Russian and international scientific and technical documentation. Certification tests of steel have shown that its properties are highly stable: its impact strength and mechanical characteristics do not change significantly after prolonged exposure and meet the relevant requirements.

For the weld cladding of the inner spherical surface of the RCP sphere body, an overlay welding machine has been purchased. It was put into pilot operation at the end of 2022.

New pump type (RCP-1753)

Life tests (with a total duration of 5,000 hours) of the prototype of a new type of pump unit, RCP-1753, developed using cutting-edge technologies, have been succesfully completed. Its main feature is the water lubrication system for all pump and electric motor components, which eliminates the use of oil in the reactor compartment, thus significantly improving the fire safety of the reactor unit and the NPP as a whole. The purpose of the life tests was to confirm the reliability of the RCP-1753 pump during continuous operation and to verify the possibility of its shutdown for 72 hours under conditions that fully simulate an emergency loss of power at an NPP power unit.

This design has a number of advantages and improved characteristics compared to previous types of pump units, especially in terms of reliability and efficiency, and is unique in the world.

Gas and petrochemical industry

In the reporting period, Europe's first and the world's third test bench for critical liguefied natural gas (LNG) equipment was put into operation. The development of a line of LNG pumps was initiated, and a project was launched to develop and manufacture LNG loading arms and spiral heat exchangers for LNG production using mixed refrigerants. The development of equipment for the domestically developed Arctic Cascade 2 natural gas liquefaction process was started.

Floating power units (FPUs)

FPUs have considerable commercial potential not only in Russia. Compared to other power generation sources, FPUs have a number of advantages: they are environmentally friendly and help to address the electricity pricing issue by ensuring a stable long-term cost of electricity. In addition, they can also be used to provide heat supply to various facilities.

Contribution to the technological sovereignty of the Russian Federation

Nuclear power engineering facility with an HTGR

The global trend towards decarbonisation and carbon neutrality in energy supply for industry, transport and utilities can be supported through the development of hydrogen energy.

to hydrogen energy.

Replacing imported software tools and services for product life cycle management and process control

A project has been launched to replace imported solutions for an automated information system for reguirements, change and configuration management (AIS RCCM). The system makes it possible to manage engineering data (the regulatory framework, project requirements, technical documentation) at various stages of the life cycle of supplied equipment, track data versions, establish relationships, configure access rights, etc. The AIS RCCM is an integrated information environment of the Mechanical Engineering Division enabling customers and manufacturers to share technical data.

Digitisation of engineering information management processes can help to speed up the implementation of ongoing projects and significantly improve their quality. In addition, this approach is mandatory for the implementation of certain current overseas NPP construction projects.

33. Moisture separator-reheater. 34. High-pressure heater 35. Low-pressure heater.

The use of energy from nuclear reactors is currently one of the main areas of focus in the global transition

Plans for 2023:

- To increase revenue from new products and sales in foreign markets:
- To carry out existing contracts and develop cooperation with foreign companies and industrial partners;
- To consolidate the Division's positions in target markets;
- To expand the range of equipment supplied by the Division and its sales footprint.

Nuclear power industry:

- To ensure the supply of key equipment and perform work under the new NPP construction programme;
- To assess the possibility for the Division to manufacture NPP equipment previously produced by enterprises outside the industry: multi-stud tensioners (MSTs) for main reactor joints and flange connectors of steam generators; inspection cavity equipment and embedded parts; main steam valve units; storage pool racks (for sealed fuel storage) and storage racks for fuel assemblies (for fresh fuel);
- To increase the volume of servicing contracts;
- To explore the possibility of supplying a wide range of equipment as part of the import substitution programme.

Gas and petrochemical industry:

- To produce and supply LNG pumps for the Arctic LNG 2 and Baltic GCC projects, produce and test pilot cryogenic LNG pumps for gas carriers;
- To implement the project to develop and manufacture LNG loading arms for the Baltic Gas Chemical Complex:
- To implement the project to develop and manufacture coil-wound heat exchangers for LNG production with mixed refrigerants for process lines supported by gravity-based structures (GBSs);
- To implement the project to develop and manufacture ethane evaporators for the Arctic Cascade 2 process.

Thermal power industry:

- To complete the supply of equipment for municipal waste incineration plants and prepare the first two plants for commissioning;
- To develop the project to build a municipal waste incineration plant;
- To participate in tenders for the supply of equipment as part of the programme to upgrade thermal power facilities and for new construction projects.

Icebreaker fleet:

- To sign contracts for the supply of equipment for follow-on nuclear icebreakers and auxiliary equipment (filters, heat exchangers, deck equipment), and large-sized castings;
- To complete the manufacture of castings of inboard struts (port and starboard) and ship them to the customer; carry out procurement procedures under the contract for the package supply of the nuclear propulsion unit.

Modernised floating power units (MFPUs):



- The Division will continue the construction of MFPUs. The project to provide power supply for the Baimskaya Ore Zone has given impetus for the development of an entire family of FPUs differing in terms of their capacity and applications (designed for use in the Arctic and in tropical regions), providing considerable opportunities for the implementation of large-scale industrial projects.
4.4. POWER ENGINEERING DIVISION

Key results in 2022:

- Electricity output at Russian NPPs reached 223.4 billion kWh (102.5% of the target set by the Federal Antimonopoly Service of Russia).
- Consolidated revenue increased to RUB 793.2 billion (up 8% year on year).
- At the construction site of Kursk NPP-2, the reactor vessel was moved into final position at power unit No. 1, and concreting of the floor slab for the reactor coolant pump was completed at power unit No. 2.
- Design documentation for the construction of power units No. 3 and 4 of Leningrad NPP-2 was developed.

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

The Division ranks first among major power generating companies in terms of the share in the total electricity output in Russia and is the second largest company globally in terms of installed NPP capacity.

The Division's main business areas include power and heat generation and capacity supply by NPPs and the operation of nuclear facilities (nuclear power plants), radiation sources, and storage facilities for nuclear materials and radioactive substances, in accordance with Russian legislation.



The Division includes JSC Rosenergoatom (hereinafter referred to as Rosenergoatom) (the central administration and branches, including 10 NPPs, the FTNPP, as well as the Directorate of the Baltic Nuclear Power Plant under Construction, the Capital Projects Implementation Branch Office, the Technology Branch Office, the Pilot and Demonstration Engineering Centre for Decommissioning, the Pilot and Demonstration Engineering Centre for the Decommissioning of Power Units with Channel-Type Reactors, and the Akkuyu Engineering Centre), as well as 20 subsidiaries and more than 20 controlled entities, including JSC Atomenergoremont, JSC AtomTechEnergo, JSC VNIIAES, LLC Energoatominvest, JSC CONSYST, JSC Atomdata-Centre, JSC CONCERN TITAN-2 and other organisations.

Operating results



Nuclear power generation. billion kWh

Consolidated revenue, **RUB** billion

Average headcount (across the Division), persons

Charity expenditure, RUB million

LTIFR

Key operating results in 2022

As at 31 December 2022, the Division operated 35 nuclear power units at NPPs and the power unit of a floating thermal nuclear power plant (FTNPP) with total installed capacity of 29.6 GW. These include:

- power units with EGP-6 reactors):

In 2022, electricity output at NPPs totalled 223.4 billion kWh, or 102.5% of the balance target set by the Federal Antimonopoly Service (FAS) of Russia (217.9 billion kWh) and 100.4% of the actual electricity output in 2021 (222.4 billion kWh).

UPS stood at 19.9%.

2020	2021	2022	Comments
215.7	222.4	223.4	Power generation increased by 0.4% (0.935 billion kWh) year on year due to the optimisation of maintenance and repairs at NPP power units.
592.7	735.1	793.2	There were no significant changes.
56,968	57,278	63,552	The year-on-year increase in the average headcount of the Division was due to the increase in the headcount of TİTAN2 IC IÇTAŞ as a result of its merger with a contractor.
3,117	2,111	1,924	The change was due to the optimisation of budgeted funding of charitable initiatives in 2022.
0.03	0.04	0.12	The change was due to an increase in the number of minor accidents.

 22 power units with VVER reactors (including 13 power units with VVER-1000 reactors, four power units with VVER-1200 reactors and five power units with different versions of VVER-440 reactors):

- 11 power units with channel-type reactors (eight power units with RBMK-1000 reactors and three

Two power units with sodium-cooled fast neutron reactors (BN-600 and BN-800).

The NPP capacity factor stood at 86.21% in 2022. The share of electricity generation by Rosenergoatom's NPPs operating in the Unified Power System of Russia (UPS) in the total electricity generation within the Electricity output exceeded the target set by the FAS of Russia due to the optimisation of duration of scheduled repairs at power units and the operation of NPP power units above rated capacity.

Contribution to the technological sovereignty of the Russian Federation

Strategic goals of JSC Atomenergoprom include achieving global leadership in state-of-the-art technology.

In 2022, R&D funding as part of the Capital Investment Programme (CIP) totalled RUB 11,069.9 million.

In 2022, Rosenergoatom's revenue from the sale of innovative products increased to RUB 199.7 billion, which is more than 25% of its total revenue.

Key focus areas for Rosenergoatom's technological development include the following:

- Improving design solutions for conventional VVER technology;
- Optimising design solutions to increase the efficiency of the turbine island of NPP power units;
- Providing a rationale for the extension of the fuel cycle and operation in a load following mode for new NPP power units;
- Developing new low-waste technologies for liquid radioactive waste (LRW) management;
- Validating hydrogen explosion safety of NPP power units in the event of severe accidents;
- Developing new VVER technologies involving spectral reactivity control and supercritical coolant pressure in the primary circuit;
- Developing nuclear hydrogen technologies

Practical development of new nuclear power generation technologies forms part of a Federal Project titled 'New Nuclear Power Industry, Including Small Nuclear Reactors for Remote Areas' included in the Comprehensive Programme 'Development of Technical Capabilities, Technology and Scientific Research in the Use of Nuclear Energy in the Russian Federation until 2024' (hereinafter referred to as the Federal Project and the Comprehensive Programme respectively)³⁶. The goals of the Comprehensive Programme include supplying clean and affordable energy to remote areas of the Russian Federation, entering the growing global markets for closed-cycle technologies and fuel, as well as the market for small NPPs.

As part of the Federal Project, Rosenergoatom has initiated the testing of technologies for the use of uranium/plutonium mixed oxide (MOX) fuel in the BN-800 fast reactor at Beloyarsk NPP. By the end of 2022, 93% of the reactor core was already loaded with MOX fuel, and in 2023, it will be fully loaded.

In addition, as part of the Federal Project, Rosenergoatom has initiated the development of a design for a two-unit NPP with a medium-power VVER spectral shift control reactor. Potential advantages of the design include the possibility of fully loading the core with MOX fuel, a reduction in the consumption of natural uranium, the possibility of eliminating the use of boron control during reactor operation at power, and a reduction in the amount of radioactive waste.

Rosenergoatom plans to build a two-unit medium-power NPP at the Kola NPP-2 site, with power unit No. 1 to be commissioned in 2035 and with a potential for the future roll-out of such power units at new sites.

Plans for 2023

Production operations:

The target for electricity generation at NPPs for 2023 has been set at 214.2 billion kWh (in line with the balance target of the Federal Antimonopoly Service of Russia and the target of the Government Programme of the Russian Federation 'Development of the Nuclear Power and Industry Complex').

MOX fuel.

Construction of new power units:

No. 1 and 2 of Kursk NPP-2:

- To achieve a completion percentage of 50.72%;
- 11–12UBN at power unit No. 1;

No. 3 and 4 of Leningrad NPP-2:

International business:

- Rooppur NPP (Bangladesh);

In 2023, Rosenergoatom plans to complete the conversion of the BN-800 reactor core at Beloyarsk NPP to

- To install diesel generators to ensure emergency power supply for safety systems in buildings

- To complete the installation of equipment in the reactor pit at power unit No. 2.

- To obtain a licence for the construction of nuclear facilities at power units No. 3 and 4.

To reach key milestones in the construction of Akkuyu NPP (Turkey) and El Dabaa NPP (Egypt);

— To continue the commissioning of power unit No. 2 at the Belarusian NPP and power unit No. 1 at

To ship the first batches of cobalt-60 produced at Smolensk NPP and Kursk NPP;

- To ensure that the Division's share in the global market for cobalt-60 for sterilisation reaches up to 30%;

- To carry out scheduled preventive maintenance of power units abroad, including the supply of the necessary equipment and provision of technical support by the personnel of Russian NPPs.

^{36.} The Programme has been extended until 2030 by Decree No. 202 of the President of the Russian Federation dated 14 April 2022 on the Extension of the Comprehensive Programme 'Development of Technical Capabilities, Technology and Scientific Research in the Use of Nuclear Energy in the Russian Federation until 2024'

INNOVATIONS AND NEW PRODUCTS

RUB 697.5 BILLION REVENUE FROM NEW PRODUCTS

INNOVATIONS AND NEW PRODUCTS

5.1. RESEARCH AND INNOVATIONS

Key results in 2022

- Revenue from new products of the Research Division increased six-fold over five years.
- Revenue from new products of JSC Science and Innovations makes up about 50% of total revenue.

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

JSC Science and Innovations (managed by JSC Atomenergoprom) is the key nuclear organisation responsible for scientific research. The activities of JSC Science and Innovations have been grouped into three units focused on specific disciplines: the Physics and Energy Unit, the Electrophysics Unit, and the Chemical Technology Unit; an Industry-Wide Competence Centre for Intellectual Property Management (an IP operator) has been established.

An important area of operations for JSC Science and Innovations is the development and commercialisation of the Division's technological competences, the search for and structuring of technologies and their subsequent sale on the domestic and foreign markets.

Twelve companies controlled by JSC Science and Innovations³⁷ are directly involved in R&D and innovation activities.

Performance in 2022

Comprehensive programme 'Development of Technical Capabilities, Technology and Scientific Research in the Use of Nuclear Energy in the Russian Federation until 2024'

In 2022, institutes forming part of JSC Atomenergoprom's Research Division met all key targets set for three federal projects included in the comprehensive programme titled 'Development of Technical Capabilities, Technology and Scientific Research in the Use of Nuclear Energy in the Russian Federation' (CP DTTS).

Construction of experimental test facilities in order to develop technologies for a two-component nuclear power industry based on the closed NFC (second federal project included in the CP DTTS)

All R&D activities under government contracts concluded with institutes forming part of the Company's Research Division for research and preparation of a safety case for the MBIR research reactor, life extension of the BOR-60 reactor and validation of innovative radiochemical technologies were completed.

The MBIR multipurpose fast neutron research reactor will enable the validation of technologies for a twocomponent nuclear power industry and the closed fuel cycle. It is designed primarily for reactor testing of innovative structural and fuel materials for the core of fourth-generation nuclear power systems, including fast neutron reactors and low- and medium-power thermal reactors. The facility will be unique and will become the most powerful among fast neutron research reactors currently in operation, under construction or at the design stage worldwide. In addition, steps are being taken to establish the International Research Centre based on the MBIR reactor (IRC MBIR); its development will provide a foundation for the promotion of fast reactor technology on the global market by enabling broad international research collaboration.

An international programme is being developed based on the national programme of advanced experimental research at MBIR approved in 2021. To support these efforts, an Advisory Board has been established; it comprises leading Russian and foreign experts in the nuclear industry. 56 researchers, experts and executives from more than 13 leading research centres in Russia, China, India, Kazakhstan, Uzbekistan, Vietnam, Algeria and Armenia, as well as international organisations of the IAEA and the Joint Institute for Nuclear Research (JINR) participated in person or online in the first meeting of the IRC MBIR Advisory Board held at JSC SSC RIAR in July 2022.

R&D focused on the developm included in the CP DTTS)

A laboratory prototype of a plasma accelerator for a neutron source based on plasmoid collisions was designed and built. In addition, a diagnostic facility was built for measuring plasma parameters and neutron yield; experimental research was conducted to determine the parameters of the laboratory prototype of a plasma accelerator and its power unit. In 2022, pulsed power sources were designed and produced for a system for working gas pre-ionisation in the plasma accelerator; experiments were carried out with neutron detectors. These devices and experimental findings will provide a basis for a compact high-intensity neutron source designed for the testing of components of fusion reactors.

As part of the development of a prototype for a plasma jet engine, in 2022, the institute built a plasma accelerator with a system for working medium pre-ionisation, carried out experiments to examine its energy balance with a high specific impulse and developed methods for extending the service life of its electrodes. Following the completion of all activities in 2024, the institute will build an engine prototype with improved thrust and specific impulse outperforming alternative solutions in terms of jet power (300 kW), thrust (6 N) and specific impulse (100 km/s).

As part of another R&D project, specialists produced working designs for key systems and components of a mock-up of a driver module for laser fusion; they also developed and examined vacuum spatial filters and produced a mock-up of a diode emitter, a cryogenic fan with a flow channel and active components. This work will result in the development of a unique research facility that will make it possible to study physical processes and phenomena that occur during diode pumping and cryogenic cooling of the active medium, model, examine and test complex laser systems, and test laser subsystems and circuits in a wide range of operation. Scientific research in this area will help to develop world-class repetitively pulsed laser devices with a high average emission power.

As part of another R&D project, specialists completed research focused on laser surface modification of metallic materials. This included developing a laser shock hardening process, which eliminates internal stresses in metal samples, increases their fatigue resistance and durability without the need for subsequent machining. This enhances the strength performance of structural steel used in gas turbine components, with surface hardness increasing by a factor of 3.5 and surface roughness decreasing by 25%. A pulsed plasma jet device was developed for the treatment of complex-shaped parts.

R&D focused on the development of compact high-intensity neutron sources (third federal project

^{37.} A full list of organisations is available on the website at http://www.innov-rosatom.ru/network/vertical/nii/

Development of new materials and technologies for advanced energy systems (fourth federal project included in the CP DTTS)

The Company's research organisations carried out 12 government R&D contracts worth a total of more than RUB 1.7 billion. Research is focused on three areas: the development of new materials and technologies for existing and advanced power generation units; the synthesis of superheavy elements and the study of properties of matter under extreme conditions (MEC); the development of a molten salt research reactor (MSRR).

More specifically, in 2022, specialists from the Company's research organisations developed and produced two 3D printers that can be used to manufacture products from ceramic materials (using the FDM/LDM and SLA techniques) and polymer materials (using the FDM technique). This method significantly reduces the lead time for the required parts and helps to optimise production costs.

Research on MEC involved building a test bench to study metal corrosion from simultaneous exposure to humid air and ionising radiation, reducing the required duration of experiments several thousand-fold. Specialists at JSC Science and Innovations also developed technology for introducing catalytic particles into a reactive medium, restoring the catalytic activity of activated particles, and producing passive catalytic recombiners for flameless hydrogen combustion.

International projects

In 2022, the Company fulfilled all its obligations to foreign customers under existing contracts carried out jointly with organisations in Europe, the US, Latin America and Asia and aimed at developing hightechnology sectors, such as thermonuclear power, improving the safety of nuclear technology, developing and improving new types of nuclear fuel and new materials.

In addition, contracts were concluded with new partners from China, India and Thailand for the supply of products manufactured by the Company's enterprises and for the provision of services and conducting high-technology experiments using Russian research facilities.

At the ATOMEXPO 2022 International Forum in November 2022, a research cooperation agreement was signed with the Institute of Nuclear Physics of the Academy of Sciences of the Republic of Uzbekistan. Under the agreement, the parties will jointly implement projects and conduct R&D in the field of radiation materials science and astrophysics and will cooperate in order to develop technologies for the production of radionuclides for nuclear medicine.

Overall, over the past five years, revenue from new products of JSC Science and Innovations has increased six-fold, accounting for around 50% of total revenue.

Intellectual property management

The Company continued to take steps to ensure legal protection of intellectual property of JSC Atomenergoprom and its organisations in Russia and abroad. In 2022, specialists at the Industry-Wide Competence Centre for Intellectual Property Management (the IP operator) filed 52 foreign patent applications. Based on applications filed in previous years, 16 Russian and 153 foreign patents were obtained in 2022. Principal patented areas include key components and technologies for VVER reactors, radiopharmaceuticals based on medical isotopes, new materials for nuclear reactor units, and fuel assemblies for nuclear reactors for NPPs.

In addition, employees of the IP operator filed 13 Russian applications for inventions and utility models and six applications for state registration of computer software and databases as part of projects included in the Consolidated Industry-Wide Plan of R&D Topics (CIPT). Overall, in 2022, the Company's specialists registered the rights over 624 items of intellectual property.

Russian Federation

The Company consistently develops technologies and new products to ensure the country's technological sovereignty by developing and implementing solutions that do not rely on imported technology.

JSC Research Institute of Nuclear Materials (INM, Zarechny, Sverdlovsk Region) carried out reactor tests of fuel for a new type of high-temperature gas-cooled reactors (HTGRs) and the initial stage of comprehensive pre-irradiation and post-irradiation examination of micro-fuel elements, fuel compacts and matrix graphite. This research has helped to optimise the fuel fabrication technology for HTGRs.

Based on applications filed in the reporting year for this type of research, in 2022, JSC INM obtained two Russian patents. Reactors of this type are intended to be used for more efficient hydrogen production. At the request of TEPCO (Tokyo Electric Power Company, Japan), researchers at JSC INM validated the safety of storage of sorption columns used for the treatment of water contaminated with caesium-137, strontium-90 and tritium radionuclides (the water was used to cool damaged reactors at the Fukushima Daiichi NPP in March 2011).

Plans for the medium term

Innovative development priorities in the nuclear industry are informed by prioritised areas approved by ROSATOM's Strategic Council and formalised in the Government Programme 'Development of the Nuclear Power and Industry Complex in the Russian Federation', the CP DTTS and other government programmes of the Russian Federation involving JSC Atomenergoprom.

As part of the third federal project included in the CP DTTS, the Company plans to develop a compact high-intensity neutron source for the testing of fusion reactor components, with completion scheduled for 2024.

As part of the fourth federal project included in the CP DTTS and focused on the development of new materials and technologies for advanced energy systems, by the end of 2024, the Company plans to produce six samples of new equipment and at least 11 new materials with higher strength and corrosion resistance and improved radiation properties for the same service life. By the end of 2030, the Company will start to manufacture products from basic materials on an industrial scale, which will enable it to design advanced energy systems using them.

Development of technologies supporting the technological sovereignty of the

GRI 2-6 GRI 3-3 5.2. BUSINESS DIVERSIFICATION

Key results in 2022*:

- Revenue from the sales of new products outside the scope of the nuclear industry totalled RUB 697.5 billion, up by 111.6% compared to 2021.
- The 10-year portfolio of orders for new products outside the scope of the nuclear industry reached RUB 2,250.0 billion, up by 14.0% compared to 2021.

*Including the portfolio of ROSATOM.

One of the strategic goals of ROSATOM and JSC Atomenergoprom is to develop new products for the Russian and international markets. The relevant operations provide new opportunities for developing healthcare and municipal infrastructure, improving environmental safety and making progress in other key areas relevant to sustainable development.

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 organisations. Responsibility for new business development has been assigned to the Development and International Business Unit of ROSATOM.

In accordance with ROSATOM's business strategy, it is intended that new products will make up 40% of the total revenue by 2030. The system for managing new businesses at the level of the Corporation is focused on the development of 15 strategic programmes (wind power, products and services for the oil and gas industry, industrial and consumer waste management, development of the nuclear medicine and technology product line, energy storage systems based on electrochemical cells, digital products, the Smart City, an international logistics operator, APCS and electrical engineering, development of the lithium business, renewable energy (foreign markets), hydrogen energy, gold mining, etc.).

At the same time, the Company is actively searching for areas that could become strategically important in the near future.

Results in 2022

In the reporting year, revenue from new products of ROSATOM's organisations (including JSC Atomenergoprom's organisations) under contracts with counterparties outside the industry totalled RUB 697.5 billion, which is 108.2% higher than the target set for 2022 (RUB 335 billion) and 111.6% higher than the figure for 2021 (RUB 329.6 billion)³⁸.

The target and historical figures were exceeded in 2022 mainly due to an increase in volume in the following business areas: transportation and logistics services, electricity sales, special steel, digital products, reprocessed products, solutions for the urban environment, shipbuilding, and SNF management.

Process control systems and electrical engineering

In order to replace imported radio and electronic equipment used in automated process control systems and manufacturing execution systems (APCS and MES), as part of R&D activities conducted in 2022, the Company developed engineering designs and produced mock-ups of industrial network switches using domestically produced basic electronic components.

To meet the needs of the nuclear industry, prototypes of 6 (10) kV cubicle switchgear were produced based on components supplied by Russian manufacturers, and research focused on generator switches and on the search for technical solutions for sealed cable penetrations was completed. In order to improve information security and cybersecurity at nuclear facilities, a software and hardware system was developed to ensure information security of APCSs at NPPs; a pilot APCS test site was established to test software and these systems.

For non-nuclear markets, a SCAI data networks were produced.

Plans for 2023:

- To expand the footprint on external automation markets; to do so, the Company will obtain licences for a new controller and an engineering centre;
- To complete the development of a number of digital products and solutions in the sphere of information security in order to expand the range of trusted digital platforms offered by the Company;
- To start the commercialisation of the SCADA system developed by the Company, including certification by the FSTEC of Russia and validation by key customers, as well as developing software for a digital industrial platform and testing it to assess its compliance with information security requirements.

GRI 2-6 Wind power

JSC Atomenergoprom is actively developing the Russian wind power market. Following competitive selection as part of the DPM RES 1.0 and DPM RES 2.0 government programmes aimed at promoting the development of renewable energy generation in the Unified Power System of Russia, the Company has formed a portfolio of projects with a total capacity of 1.7 GW.

JSC Atomenergoprom produces 2.5 MW wind turbines in-house. At year-end 2022, local content in equipment produced by the Company stood at 68%.

The Company's WPPs generated 1.960 billion kWh of electricity in 2022.

Electricity output from WPPs in 2021 and 2022, billion kWh



On 19 December 2022, the Company's seventh wind farm, the 60 MW Berestovskaya WPP, was put into operation. Thus, by year-end 2022, seven wind farms with a total capacity of 780 MW were in operation.

In 2022, investments exceeded RUB 27 billion (including VAT).

In 2023, the Company plans to commission the 160 MW Kuzminskaya WPP and the 95 MW Trunovskaya WPP. As a result, the number of wind farms managed by JSC NovaWind (a company controlled by JSC Atomenergoprom) will reach nine wind power plants, while their total installed capacity will exceed 1 GW.

In 2023, the Company plans to make the first wind power project acquisitions outside Russia.

For non-nuclear markets, a SCADA system was developed in-house, and mock-ups of switches for industrial

^{38.} The increase was due to the inclusion of MC Delo in the scope of revenue calculation.

In accordance with the Company's international business strategy, the target for the total installed capacity of overseas wind farms to be owned by the Company by 2030 has been set at 5 GW.

Hydrogen energy

An integrated road map for the development of the Hydrogen Energy high-technology area until 2030 has been approved. On 16 January 2023, the Government of the Russian Federation and ROSATOM signed an Agreement on Cooperation in the Development of Hydrogen Energy.

Under the agreement, by 2030, ROSATOM will implement a programme focused on domestically developed technologies for the production and handling of hydrogen, will start mass production of Russian electrolysis units of various capacity and will work on a project to build a nuclear power plant for hydrogen production comprising an HTGR and chemical processing facilities.

In February 2022, JSC Atomenergoprom's companies participated in the establishment of the National Hydrogen Energy Development Union (the National Hydrogen Union). The Union aims to promote cooperation between businesses and research institutes in order to develop hydrogen energy in Russia, coordinate the efforts of market players, support the implementation of the National Hydrogen Programme. and formulate proposals for regulations on support to be provided to the sector jointly with government agencies. It is expected that the Union's members will include companies, consumers, financial institutions and research organisations.

In the reporting year, a number of agreements were signed with Russian and foreign partners in order to develop cooperation and unlock opportunities for joint implementation of pilot hydrogen projects. As a follow-up to an R&D cooperation agreement with Moscow Institute of Physics and Technology (MIPT), a contract was signed for the delivery of a pilot hydrogen production module.

Logistics services

The number of shiploads transported in 2022 increased by 10 compared to 2021 and totalled 19. 75,000 freight tonnes of cargo were transported (up by 50,000 tonnes compared to 2021).

The order portfolio totalled RUB 3.5 billion, up by RUB 1.7 billion compared to 2021. Cargo deliveries were made for Rooppur NPP (Bangladesh), Akkuyu NPP (Turkey) and Kudankulam NPP (India). In addition, cargo deliveries from Russia. India, China and other countries were arranged. Customs clearance of 20 million tonnes of coal to be transported to China was arranged.

In 2022, test cargoes were transported along the North – South and Silk Road International Transport Corridors.

Amid restrictions imposed by the EU on Russia and Russian hauliers, cargoes critical for NPP equipment manufacture were delivered to Russia. Oversized cargo with a volume of about 1,500 m³ was shipped to Rooppur NPP, setting a record in the history of Rusatom Cargo.

To support the implementation of the Eurasian Container Transit project, in 2022, contracts were signed for the design of Arctic container ships and the Western Transport and Logistics Hub (WTLH); a conceptual design of the container ship was developed, and the relevant tests were conducted. As part of the development of the WTLH, a lease agreement was concluded for a land plot in the Murmansk Region in order to carry out surveys. Engineering surveys were mostly completed in 2022. In 2022, a concept for the digitisation of the Eurasian Container Transit project was developed and approved; these developments underpin the design of the WTLH and the commercial fleet.

In 2023, the Company plans to take steps to improve the efficiency of logistics arrangements in the industry and to develop commercial logistics.

Gas and petrochemical industry

In March 2022, the first tests were completed on a new test bench for medium- and large-capacity equipment for LNG projects built by JSC Atomenergomash at the site of JSC Efremov Institute of Electrophysical Apparatus (NIIEFA) in Saint Petersburg; the test bench is unique in Europe.

The first item of equipment to be tested on the test bench was the ENK 2000/241 large-capacity cryogenic LNG pump designed to load liguefied gas from storage tanks into the tanks of an LNG carrier. It is currently the most efficient LNG pump manufactured in Russia. The successful tests confirmed the reliability and operability of equipment made in Russia and validated the capabilities of JSC Atomenergoprom's Mechanical Engineering Division in the sphere of development of new high-technology products for the gas industry.

The development of a fundamentally new LNG storage and transportation technology involving the use of independent tanks made of carbon-fibre-reinforced plastic was initiated. Research focused on the development of a cargo containment system, including the design of a Project 10070 gas tanker, was completed, and positive feedback was obtained from both the Maritime Register and Russian shipowners that are potential customers for this product. The project was included in the Northern Sea Route development plan until 2035 and supported by the interdepartmental Commission on Promoting National Interests in the Arctic under the Security Council.

In the reporting year, the Company initiated the production of a pilot prototype of the first Russian working fluid turboexpander with the fullest possible use of domestically produced components and the first Russian LNG marine loading arm, with tests scheduled for 2023.

Nuclear-powered icebreaker fleet

nuclear icebreakers.

Small nuclear power plants

An agreement was signed with PJSC Selidgar to supply power from a small nuclear power plant for the development of the Kyuchus deposit in the Ust-Yansky and Verkhoyansky Districts in the Sakha Republic (Yakutia). Under the agreement, the world's first onshore small NPP with a RITM-200N reactor unit will supply electricity for 40 years starting from 2028. A positive opinion was obtained from the State Environmental Expert Review Board for supporting materials for the licence for the placement of the NPP.

ROSATOM signed a cooperation agreement with the Ministry for the Development of the Russian Far East and Arctic to build a small NPP with a RITM-200N reactor in the Sakha Republic (Yakutia) as part of the Far Eastern Concession Programme.

On 16 June 2022, a letter of intent on cooperation in the promotion of small NPP projects based on the SHELF-M reactor unit (up to 10 MW) was signed with the Sakha Republic (Yakutia) at the Saint Petersburg Economic Forum.

Enterprises in the Mechanical Engineering Division shipped a total of eight RITM-200 reactors for four

The engineering design was developed for the RITM-200N reactor unit; it has enhanced characteristics compared to the RITM-200 marine reactor unit and has been adapted for onshore use.

The Company continued to cooperate with potential foreign customers for small NPPs; a number of documents were signed as part of exploration of opportunities for cooperation in the construction of new Russian-design nuclear power units, including in Kyrgyzstan, Myanmar and other countries.

The Mechanical Engineering Division is building follow-on floating power units (FPUs), the Company's new promising product designed to provide power supply to remote areas and new industrial clusters and production facilities. In 2022, the Division started to manufacture RITM-200S reactor units for the FPUs ordered from the Company to provide power supply for the Baimskaya Ore Zone. In addition, the hulls of the first two FPUs for LLC GDK Baimskaya were laid in the reporting year.

A total of four FPUs with installed power generation capacity of up to 110 MW each (three main FPUs and one standby FPU) will be produced. The project to provide power supply for the Baimskaya Ore Zone has given impetus for the development of an entire family of FPUs differing in terms of their capacity and applications (designed for use in the Arctic and in tropical regions), providing opportunities for the implementation of large-scale industrial projects and exports from the Russian Federation.

Environmental protection

As part of the Infrastructure for the Management of Hazard Class 1 and 2 Waste Federal Project, in 2022, ROSATOM (with assistance from JSC Atomenergoprom's organisations) carried out preparatory, construction and installation work at the sites of industrial facilities in the Saratov and Kurgan Regions (the Gorny and Schuchye facilities); main steel structures were assembled; the construction of new buildings and deliveries of process equipment were started. In addition, construction was started in the Kirov Region and the Udmurt Republic (the Maradykovsky and Kambarka facilities); preparatory work was carried out. Positive opinions following state expert reviews and construction permits were obtained for greenfield industrial facilities to be built in the Irkutsk and Tomsk Regions (the Vostok and Western Siberia facilities); construction contracts were concluded, and preparatory work was started. A contract was concluded for the development of design documentation and the construction of the RG Centre industrial facility in the Nizhny Novgorod Region.

As part of the Clean Country and Preservation of Lake Baikal Federal Projects, the Company continued the remediation of particularly challenging legacy sites causing environmental damage.

Work was started as part of the project to repair historical environmental damage at the Krasny Bor toxic industrial waste landfill. Construction of a multilayer cut-off wall surrounding the landfill site was underway; it is designed for groundwater diversion and prevents the seepage of contaminants to adjacent areas. The structure will be equipped with an automated control system. In addition, the construction of infrastructure for wastewater treatment and for the processing of liquid and paste-like waste stored in open landfill cells was started.

Government contracts were concluded as part of the project to repair historical environmental damage in the Usolye-Sibirskoye municipality (Irkutsk Region). The dismantling of 243 buildings and structures was completed; in addition, 136.18 tonnes of hazard class 2, 3 and 4 waste moved from 17 dilapidated tanks into new tanks in 2020 were removed from the Usolyekhimprom industrial site and transferred to specialised organisations for disposal.

As part of the project to repair historical environmental damage from the operations of OJSC Baykalsk Pulp and Paper Mill (BPPM), measures were implemented to lower the water level above the sludge layer in landfill cells at the Babkhinsky and Solzansky landfills. This helped to prevent potential contamination of Lake Baikal with waste generated by the enterprise. About 70,000 m³ of wastewater was treated and transferred to municipal sewage treatment facilities in Baykalsk.

In 2023, the Company will continue to build infrastructure to enable the safe management of hazard class 1 and 2 waste, with the Gorny and Schuchye sites to be commissioned in December 2023.

In 2023, the Company will continue to take steps to repair environmental damage caused by legacy sites. Measures to repair historical environmental damage at the Krasny Bor landfill site are scheduled to be completed in 2025, while work in the Usolye-Sibirskoye municipality and at the site of OJSC BPPM (the Babkh-insky landfill and the site of the central wastewater treatment facilities) is scheduled for completion in 2026.

Nuclear medicine

Despite restrictions, in 2022, ROSATOM and JSC Atomenergoprom managed to increase their overseas revenue from isotope products by 8.6%.

In the reporting year, JSC Isotope Regional Alliance concluded 149 new contracts to supply isotope products abroad. Logistics, supply chains and payment arrangements were redesigned.

Imports of life-saving drugs were replaced. More specifically, deliveries of radioimmunoassay (RIA) kits produced in the Republic of Belarus were started in order to replace brands that had left Russia, and the supply of samarium-153 oxabifor for the treatment of bone metastases was increased by 53%.

Agreement was reached with foreign consumers of cobalt-60 to supply material from Russian targets.

Enriched zirconium-96 was prova customer.



INCREASE IN OVERSEAS REVENUE FROM ISOTOPE PRODUCTS

Enriched zirconium-96 was produced in gas centrifuges for the first time in the world and was delivered to



A contract was concluded with the operator of Brazilian NPPs for the supply of depleted zinc-64 to NPPs in Brazil. The first batch of the product was successfully delivered to São Paulo Airport in November 2022.

The Tula Regional Cancer Centre was the first in Russia to receive a BRACHIUM gamma radiation therapy facility and carried out the first radiation therapy procedures. A distribution contract for the supply of BRACHIUM facilities was signed with Republican Unitary Enterprise Medtechnocentre (Belarus).

A registration certificate was obtained from the Federal Service for Surveillance in Healthcare (Roszdravnadzor) for the ONYX radiation therapy facility.

The pilot operation of a manufacturing site was started as part of the project to localise the manufacture of diagnostic equipment.

The project to develop a competitive domestically produced 1.5 T MRI scanner received government support from the Ministry of Industry and Trade. On 15 December 2022, an agreement was signed on the provision of subsidies from the state budget. A contract was concluded for the development of the MRI scanner.

A turnkey contract for the supply of a cobalt-60 source to replace existing gamma irradiation equipment was signed with a company from Bangladesh.

As part of the initiative to establish a multipurpose irradiation centre in the Republic of Tatarstan, the production of main process equipment and the construction of a shielding room for an accelerator were started.

The development of a pilot ONYX remote radiation therapy facility (KLT-6) is nearing completion. The project will help to promote the widespread use of new medical techniques and domestically produced equipment in clinical practice, guarantee a higher quality of treatment for cancer patients and reduce dependence on expensive imported equipment.

Energy storage systems

In October 2022, the construction of Russia's first 'gigafactory' started in the Kaliningrad Region; the factory will produce lithium-ion batteries (cells) and assemble battery modules. The factory will meet the demand of Russian electric vehicle producers for lithium-ion traction batteries; it will also produce stationary energy storage systems for the power grid and for industrial enterprises.

The factory will become a fully integrated lithium-ion battery production facility, with its operations covering all stages from the mixing of cathode and anode mass components to the outgoing inspection of finished products.

The first batteries will come off the production line in 2025. The first stage of the 'gigafactory' will have a capacity of 4 GWh per year, supplying lithium-ion batteries for up to 50,000 EVs. If demand for the products is confirmed, the second and third stages of the factory may be commissioned. Battery assembly capacity in Russia has been increased from 15 MWh per year to 150 MWh per year; a universal battery module based on a new type of lithium-ion cells has been developed.

Smart City

In the reporting year, the development of the Digital Heat Supply and Infrastructure IoT Platform products was completed, and they were launched on the market. In 2022, the Smart City solutions covered 12 regional projects, 18 nuclear towns and cities and 84 non-nuclear towns and cities.

16 towns and cities where the Smart City projects were implemented in the nuclear industry ranked high in the Urban IQ Index ranking compiled by the Russian Ministry of Construction, Housing and Utilities for 2022.

A greenhouse gas emission rep operate.

Six concession agreements aimed at managing and upgrading resource supply systems in Lesnoy, Glazov, Kursk, Voronezh and Yuzhno-Sakhalinsk are being implemented.



TOWNS AND CITIES WHERE THE SMART CITY PROJECTS WERE IMPLEMENTED IN THE NUCLEAR INDUSTRY RANKED HIGH IN THE URBAN IQ INDEX RANKING COMPILED BY THE RUSSIAN MINISTRY OF CONSTRUCTION, HOUSING AND UTILITIES

A greenhouse gas emission reporting verification and validation body was established and accredited to

DIGITAL TRANSFORMATION

RUB 105.88 MILLION ECONOMIC BENEFITS FROM PROJECTS FOCUSED ON END-TO-END DIGITAL TECHNOLOGIES AND DATA MANAGEMENT

6 DIGITAL TRANSFORMATION

Key results in 2022:

- 10 pilot projects were implemented in the sphere of end-to-end digital technologies and data management, with benefits totalling RUB 105.88 million.
- An international version of the Logos product was developed.

GRI 3-3 6.1. UNIFORM DIGITAL STRATEGY

ROSATOM and JSC Atomenergoprom are implementing a Uniform Digital Strategy (UDS) approved in 2018. This is the first strategy of this kind approved by a Russian state-owned corporation. The UDS is regularly updated taking into account changes in the internal and external environment.

Keystakeholders in the implementation of the Uniform Digital Strategy are the enterprises and organisations of ROSATOM and JSC Atomenergoprom, as well as partner companies that are potential consumers of digital products of ROSATOM and JSC Atomenergoprom, and the Government of the Russian Federation, which monitors the implementation of the Digital Technology Federal Project forming part of the Digital Economy National Programme. All organisations managed by the Company contribute to the digitisation of the nuclear industry.

Digitisation contributes to the achievement of the Company's strategic goals and is a driver of its business efficiency. In 2022, the Digitisation Unit took active steps to develop a new ROSATOM 2030 Digital Vision following an update to ROSATOM's 2030 Vision. In accordance with the updated ROSATOM 2030 Digital Vision, the UDS is scheduled to be updated in 2023; it will incorporate the requirements of federal executive authorities.

The Digital Vision prioritises the achievement of the following digitisation goals in the industry by 2030:

- Accomplishing 100% of tasks set by the government;
- Global technological leadership;
- A 10-fold increase in digital revenue;
- Digital technologies/solutions developed by the Corporation to be applied in 30 countries worldwide;
- 100% of products to be supplied by businesses with a high level of digital maturity;
- 100% quality of digital services;
- The share of routine operations to be reduced to 0%;
- The share of people using or adopting digital technologies in their work to reach 100%;
- 5% share in the Corporation's EBITDA.

In 2023, extensive methodological activities and expert work will be initiated in order to provide a regulatory, methodological and scientific framework for digitisation in the industry and support the achievement of the goals set in the Digital Vision and the UDS.

In addition, in 2023, the Company plans to launch a dedicated internal communication campaign in order to communicate the goals set in the ROSATOM 2030 Digital Vision to every employee in the Company's Divisions and organisations in line with their specialisation and to increase their engagement in the implementation of the 2030 Digital Vision.

Economic benefits

Digitisation is one of the most important drivers of the Company's business efficiency. JSC Atomenergoprom is actively developing an approach based on a comprehensive assessment of effectiveness of IT projects in the nuclear industry.

In 2022, the uniform methodological framework for calculating benefits from the implementation of IT projects was updated; a list of mandatory projects was compiled, and the portfolio of IT projects was revised.

In 2023, the Company plans to continue to provide training in project impact assessment for managers, to continue the audit of IT projects with a focus on evaluating their effectiveness and to implement large-scale IT projects for the benefit of government customers, large businesses and the independent IT market. To unlock the significant potential of digitisation as a driver of the Company's business efficiency, JSC Atomenergoprom will apply an approach to increasing the level of digital maturity³⁹ of existing processes in its organisations which involves applying digital tools in the manufacture of all core products in the industry.

Strategic partnership with AT Consulting

On 5 March 2022, LLC Rusatom Digital Solutions (a company of JSC Atomenergoprom) and JSC AT Group (the holding company of AT Consulting Group) announced the establishment of a strategic partnership to address digitisation tasks. The alliance aims to pool the competences of the two companies in order to develop competitive digital products and solutions both for domestic customers, including government agencies, and for the international market.

During the first year of the Company's strategic partnership with JSC AT Group, all key growth targets set for the digital business were achieved. By working together, the companies achieved a number of extra synergies: the Company became a major player on the system integration market as an IT company and was offered an opportunity to participate in breakthrough government and intergovernmental initiatives thanks to having a professional IT integrator in its team, while JSC AT Group enhanced its industrial practice by participating in joint projects.

Digital Hierarchy

In 2022, the Digital Hierarchy was in place in 20 Divisions and 69 key organisations. To maintain a high professional level of chief digital officers (CDOs) managing digitisation initiatives in the Divisions and key organisations, a pilot assessment of their professional and technical competences was carried out. Based on its results, in 2023, the Company plans to develop a personalised list of training courses for each CDO who has undergone the assessment.

 Digital maturity assessment forms part of the r wide Digitisation function.

39. Digital maturity assessment forms part of the monitoring of progress in digitisation in organisations within ROSATOM's scope of consolidation as part of the industry-

Digitisation programmes in the Divisions

Digitisation programmes in the Divisions are a key tool for the decomposition of the goals of the Uniform Digital Strategy. In 2022, the Company approved a methodological framework for developing and updating digitisation programmes in the Divisions, which currently underpins the implementation of programmes in 18 Divisions in the nuclear industry.

GRI 3-3 6.2. PARTICIPATION IN DIGITISATION IN RUSSIA

ROSATOM has been granted the status of a competence centre and an active participant of the Digital Technologies Federal Project forming part of the Digital Economy National Programme⁴⁰. The Company's organisations take an active part in the implementation of the programme.

Participation in the implementation of systemic measures to ensure the technological independence of the Russian economy

In 2022, JSC Atomenergoprom and its enterprises actively participated in the implementation of Instructions No. MM-P10-10127 of the Prime Minister of the Russian Federation Mikhail Mishustin dated 16 June 2022. This involved initiating a set of large-scale systemic measures at the federal level in order to replace foreign solutions and software used in the industry with Russian analogues in prioritised areas with financial assistance from the government. The measures were implemented in cooperation with major customers in the industry and independent Russian developers.

In order to align software supply and demand in the industries, the Government of the Russian Federation established industrial competence centres responsible for replacing imported digital products and solutions, including hardware and software systems, used in key industries (hereinafter referred to as ICCs), as well as competence centres responsible for developing Russian system-wide and applied software in order to replace foreign analogues that are currently in use (hereinafter referred to as DCCs) involving leading Russian companies. Nuclear enterprises actively participated in the work of 23 ICCs and DCCs.

As a result of initiatives implemented by ROSATOM and its organisations (including JSC Atomenergoprom). 13 projects were submitted as part of the work of eight ICCs and were granted the status of particularly significant, including in terms of future government support. IT solutions to be developed and implemented as part of these projects are scalable across entire industries and are critical for ensuring the technological sovereignty of Russian enterprises.

In 2023, the Company plans to actively participate in the implementation of projects focused on the development and implementation of IT solutions by the Corporation's enterprises as part of large-scale programmes implemented by the Government of the Russian Federation in order to replace imported solutions; it also plans to continue working to improve laws and regulations on government support measures.

MANAGEMENT

The end-to-end digital technology development and data management (EDT&DM) programme provides technological capabilities for the implementation of other prioritised initiatives.

Since 2021, the Company has been taking steps to transform the End-to-End Digital Technologies and Data Management subsidiary programme into an investment programme. As part of these efforts, in 2022, a new area, the Lean Smart Plant, was included in the programme; an inventory of the programme's components was compiled; projects categorised as 'mandatory' were approved; investment indicators of the programme until 2030 were updated.

As part of the programme, in 2022:

- 10 pilot EDT&DM projects were implemented;
- components since its launch totalling RUB 105.88 million;
- 12 digital RPS benchmarks (lean smart) were developed:
- industry):
- technologies included in the EDT list is feasible);
- included in the programme;
- formulated.

The level of digitisation of an enterprise directly contributes to an increase in its margins and profit, which has necessitated the development of a universal methodology for determining whether both individual businesses and the industry as a whole have made sufficient progress in digitisation. In 2022, a methodology for assessing the level of digitisation was proposed; it is based on a detailed assessment of the possibility of digitisation of processes involved in the manufacture of core products in the industry.

Plans for 2023 include providing methodological support for the development of the programme in the industry, including the approval of local regulations on the methodology for calculating indicators for the monitoring of digital maturity of processes and products in the industry. In addition, in 2023, the Company plans to develop local regulations on data management in the industry, create 15 digital RPS benchmarks, achieve an increase in direct quantifiable benefits by at least 60%, and implement pilot projects in order to test the readiness of technological solutions and assess potential benefits from their implementation in nuclear organisations in the future.

6.3. END-TO-END DIGITAL TECHNOLOGIES AND DATA

— The Company recorded the first documented direct quantifiable benefits from the programme's

 As part of the development of laboratories of the International Research Centre for Advanced Nuclear Technologies, as well as a joint laboratory at the Obninsk Institute for Nuclear Power Engineering (a branch of NRNU MEPhl), educational programmes including activities focused on working with digital solutions were developed and implemented at Far Eastern Federal University;

 The number of organisations in the industry that apply technologies and/or sub-technologies included in the EDT list in their operations reached 50 (or 41% of the total number of organisations in the

 The number of organisations that have developed and are implementing a road map for achieving the target status of a 'digital' enterprise in terms of EDTs that they apply reached 51 (or 42% of the total number of organisations in the industry for which the application of technologies and/or sub-

Five projects focused on rolling out the successful components of the EDT&DM programme were

 Intellectual property rights over a prototype text mining solution developed jointly with JSC RASU based on natural language processing technologies were registered, and plans for its commercialisation were

^{40.} Pursuant to Decree No. 234 of the Government of the Russian Federation dated 2 March 2019.

6.4. DIGITAL PRODUCTS

LLC Rusatom Digital Solutions and LLC Security Code established a strategic partnership to develop Russian software and hardware solutions in the sphere of information security. The alliance aims to pool the capabilities and competences of the parties in order to accelerate the development of Russian information security products and enhance the country's technological sovereignty in this area. The participants will develop synergies between their solutions and products in order to scale Russian sovereign software and hardware solutions both in Russia and abroad.

JSC Atomenergoprom updated its approach to building its portfolio of digital products; the new approach takes into account not only existing digital developments in the industry and unique knowledge of endto-end processes but also market objectives and needs that are relevant to the prioritised sectors of the Russian economy.

The target portfolio includes a variety of custom tools, products and services for the development of comprehensive solutions, including opportunities for establishing consortiums and partnerships and engaging third-party developers.

Enterprise and production management

The Company's updated digital product portfolio 4.0 includes the following products:

- The Atom Mind industrial predictive analytics system;
- Data analytics products: Almaz ETL and Almaz Monitoring.

The Atom.RITA, Atom Mind and My Voice digital products have been included in the Unified Register of Russian Software compiled by the Ministry of Digital Development, Communications and Mass Media of the Russian Federation.

In November 2022, the Atom.RITA product (JSC Greenatom) was launched on the market. The Atom.RITA platform is designed for developing and managing software robots that enable business process automation by reproducing user actions in web applications and software programs installed on workstations.

Digital infrastructure

In 2022, the Arktika Data Centre was designed; it will form part of a programme to develop a geographically distributed disaster-resilient network of data centres and infrastructure sites of ROSATOM.

The Company currently operates three data centres: the Kalininsky Data Centre in the Tver Region, the Xelent Data Centre in Saint Petersburg and the StoreData Data Centre in Moscow. Another seven data centre construction sites across the country are being developed.

Telecommunications equipment produced by JSC TVEL and software for the first switch models was developed and included in the Unified Register of Russian Software. In 2023, the equipment is scheduled to be included in the register of telecommunications equipment of Russian origin.

The Atom.Port configuration management system was included in the Unified Register of Russian Computer Software and Databases. Atom.Port is a system for the automated migration and management of mixed (hybrid) workstation infrastructure based on operating systems of the GNU/Linux and Microsoft Windows families.





PILOT PROJECTS IMPLEMENTED IN THE SPHERE OF END-TO-END DIGITAL TECHNOLOGIES AND DATA MANAGEMENT

GOVERNANCE SYSTEM

MEETINGS OF THE BOARD OF DIRECTORS OF JSC ATOMENERGOPROM HELD IN 2022

7 **GOVERNANCE SYSTEM**

7.1. CORPORATE GOVERNANCE

Objectives, principles and mechanisms of corporate governance

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

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

The corporate governance system in the nuclear industry is currently underpinned by the following key principles:

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

Key corporate governance mechanisms include the following:

 Performance of corporate governance functions with regard to nuclear organisations within the scope of powers of an asset owner or a shareholder/member, as stipulated by applicable legislation of the Russian Federation;

- Engagement on operational matters in certain areas of operations of the said organisations based on the regulations adopted in ROSATOM and its organisations.

GRI 2-10 Governing bodies Board of Directors of JSC Atomenergoprom⁴¹

The Board of Directors is elected by the General Meeting of Shareholders for a period until the next Annual General Meeting of Shareholders, with the number of Board members to be determined by the General Meeting of Shareholders but totalling no less than five members⁴².

GRI 2-9 Between 1 January 2022 and 31 December 2022, the Board of Directors of JSC Atomenergoprom GRI 2-11 consisted of seven members:

- 2. Yulia Vrzhesen;
- Kirill Komarov; 3.
- Vladislav Korogodina
- Anna Miroshnichenko;
- Natalia Plotnikova;
- 7. Ilya Rebrov.

Out of the seven members of the Board of Directors, three are the Company's employees, while four are not the Company's employees. Members of the Board of Directors own no shares in the Company.

Tenure of the members of the Board of Directors



41. Information on the composition of the Board of Directors and the Regulations on the Board of Directors are available at: http://atomenergoprom.ru/ru/corp, manag/, http://atomenergoprom.ru/u/file/pologen_sd_260421.pdf

42. https://atomenergoprom.ru/u/file/ustav.pdf

1. Ekaterina Lyakhova (Chair of the Board of Directors, Deputy Director of Atomenergoprom);



GRI 2-18 There are no independent members of the Board of Directors.

The Board of Directors carries out self-evaluation on an annual basis in accordance with the Regulations on the Board of Directors of JSC Atomenergoprom (paragraph 3.6). The self-evaluation of the Board of Directors for 2022 has been scheduled for 2023.

GRI 2-12 Competences of the members of the Board of Directors

The Board of Directors functions in accordance with the Charter. The main task of the Board of Directors is to pursue a policy that promotes the Company's dynamic growth, enhances its sustainability and increases the Company's profit.

In accordance with the Charter, the Board of Directors approves the Company's annual report, reviews and approves its sustainability reports on a guarterly basis and appoints a person responsible for sustainable development matters from among the Board members⁴³. Responsibility for sustainable development matters has been assigned to Kirill Komarov, a member of the Board of Directors of JSC Atomenergoprom⁴⁴.

The competences of the Board of Directors related to managing the Company are defined in paragraph XIII of the Regulations on the Board of Directors.

Educational profile of members of the Board of Directors⁴⁵, persons



To enable the Board of Directors of JSC Atomenergoprom to effectively perform its functions related to overseeing JSC Atomenergoprom's financial and business operations and to assist it with regard to other matters, an Audit Committee has been established under the Company's Board of Directors. The area of competence of the Audit Committee includes a number of matters, including considering the approval of sustainability reports and making the relevant recommendations to the Board of Directors of JSC Atomenergoprom.

Composition of the Audit Committee of JSC Atomenergoprom:

- 1. Vladislav Korogodin (Chairman of the Audit Committee);
- 2. Natalia Plotnikova:
- Yulia Vrzhesen.

The members of the Audit Committee are not employees of JSC Atomenergoprom. In accordance with the Regulations on the Board of Directors of JSC Atomenergoprom, resolutions of the Audit Committee are advisory in nature.

43. Subparagraphs 31, 40 and 41 of paragraph 85 of the Charter of JSC Atomenergoprom (version No. 38 dated 23 November 2022).

GRI 2-13 Director of JSC Atomenergoprom

The Director of JSC Atomenergoprom is the sole executive body. The Director is appointed and removed by the Board of Directors (paragraph 85 of the Charter of JSC Atomenergoprom). Kirill Komarov was appointed as Director of JSC Atomenergoprom as from 14 April 2020⁴⁶.

GRI 2-16 Report of the Board of Directors GRI 2-13

- (accounting) statements for 2021 were approved.
- ordinary and preferred shares of JSC Atomenergoprom.

Shareholders of the Company as at 31 December 2022



Resolutions of the sole shareholder

- Profit distribution for 2021;
- Election of the Board of Directors;

In 2022, the Board of Directors of JSC Atomenergoprom held 68 meetings.

Under the resolution of the Board of Directors dated 30 May 2022, the Company's annual financial

Under the resolution of the Board of Directors dated 17 May 2022, the auditor for 2022 was approved.

In February and March 2022, the Bank of Russia registered reports on the issuance of additional issues of

A number of decisions were taken to streamline the structure of JSC Atomenergoprom's group of companies

See 'Key Changes in the Corporate Structure in 2022'.

Interest in the Company's authorised share capital	Portion of ordinary (voting) shares in the Company held by the shareholder
95.3317%	100%
4.6683%	0%

In 2022, the shareholder owning all voting shares adopted five resolutions, including:

- Payment of dividends for 2021, for the first half of 2022 and for the nine months of 2022;

Approval of a new version of the Company's Charter and amendments thereto.

^{44.} Minutes of the meeting of JSC Atomenergoprom's Board of Directors No. 517 dated 29 April 2021.

^{45.} The data take into account the fact that some members of the Board of Directors hold more than one degree

^{46.} Minutes of the meeting of JSC Atomenergoprom's Board of Directors No. 481 dated 13 April 2020.

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

Under the resolution of ROSATOM as the holder of 100% of voting shares in JSC Atomenergoprom, in 2022, dividends were declared and paid within the prescribed time frame (see the chart).

Dividends declared and paid in 2022, RUB million



Major transactions and non-arm's length transactions

In 2022, JSC Atomenergoprom did not conclude any major 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.

GRI 2-6 Key changes in the corporate structure in 2022

- 1. In order to promote the development of corporate volunteering and corporate social responsibility in the nuclear industry, the Autonomous Non-Profit Organisation Energy of Development was established. The Autonomous Non-Profit Organisation Energy of Development was founded by companies of JSC Atomenergoprom: JSC TVEL, JSC Rosenergoatom and JSC TENEX.
- 2. An organisation of the Company acquired a controlling stake in PJSC Quadra Power Generation, one of Russia's largest regional power generation companies.
- 3. In order to develop the logistics business in the industry, JSC Atomenergoprom increased its stake in the authorised share capital of LLC MC Delo and in Global Ports Investments PLC.
- 4. A nuclear organisation acquired several subsidiaries in the Sales and Trading segment.
- 5. Business acquisitions were made in the Mechanical Engineering segment.
- Other investments included investments in the industrial, energy and research sectors. 6.

Compliance with the principles and recommendations of the Corporate Governance Code recommended by the Bank of Russia

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

GRI 2-19 Key provisions of the policy on remuneration and/or GRI 2-20 reimbursement of expenses; information on remuneration and/or reimbursement of expenses

No decisions were taken in 2022 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.

7.2. RISK MANAGEMENT

Risk management system

ROSATOM's 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 covers all of the Company's organisations.

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

- 48. The dividends were paid out of retained earnings for previous years.
- 49. Including RUB 11,760 million paid in January 2023.

GRI 2-15 Board members who are full-time employees of the Company are remunerated for their work in accordance with the Standardised Industry-Wide Remuneration System instituted by ROSATOM and adopted by the Company in 2009. Remuneration, including salary paid to those Board members who are full-time employees of the Company, is regulated by employment contracts and applicable local regulations of the Company and ROSATOM on remuneration. Under the resolution of the General Meeting of Shareholders, members of the Board of Directors may receive remuneration and reimbursement for expenses related to the performance of their functions as members of the Board of Directors. The amount of such remuneration and reimbursement is established by the General Meeting of Shareholders. There are no KPIs for Board members who are full-time employees of the Company, including with regard to sustainability matters.

S

^{47.} Outstanding dividends for the nine months of 2021.

Results in 2022:

- The URAN (Risk Management: Analytics) Industry-Wide Risk Management System (URAN IRMS), an information system developed as part of project B-RM1-1 to build an Industry-Wide Risk Management System in ROSATOM, became fully operational;
- A list of key risk indicators was compiled, including a description, the calculation algorithm and frequency, sources of information and thresholds (baseline, warning and response thresholds);
- A system for early response to risks related to national and federal projects was in place;
- Key risks that JSC Atomenergoprom is exposed to and that affect the Company's key financial and economic indicators were identified and assessed:
- Workshops, risk sessions and conferences were held to enable risk officers and employees within the hierarchy of the Risk Management function to share their experience; this included holding a roundtable discussion titled 'Risks and Opportunities: Responding to Challenges of the Global Economy' as part of the 12th ATOMEXPO 2022 International Forum.

Risk management process at JSC Atomenergoprom







implementation of JSC Atomenergoprom's strategy.

50. 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.

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

Comprehensive risk management measures largely offset the negative impact of external factors on the

Risk management outcomes in 2022

Change in estimated risk levels for 2023:



Sustainability risks are presented in the table (see health, safety and environmental risks, climate and environmental risks, the risk of loss of and damage to assets, social and political risks in the regions of operation).



An optimal ratio of assets and liabilities denominated in the same currency was maintained in the reporting year. Foreign currency liabilities were met without raising additional funds to compensate for exchange rate fluctuations. In 2022, the Company recorded foreign exchange gains on currency conversion transactions.



- Rolling liquidity forecasts and cash flow budget;
- Maintaining required amounts of open lines of credit with banks (funds committed by banks);
- ^s Reducing the period of keeping spare cash on bank deposits when this is advisable from an economic perspective;
- Discussing matters related to state support with Russian federal executive authorities;
- Active use of project financing instruments as part of implementation of projects and programmes by the Company and its organisations;
- Maintaining the credit rating assigned to the Company by the national rating agency, JSC Expert RA.

Results:

The Company maintained sufficient liquidity to repay liabilities on time, preventing unacceptable losses and reputational risk.

For details, see section 7.3 'Financial Management'.



3

Risks and changes in risk levels (risk owners)	Risk description	Risk management practices	6	Connection wit strateg goals
Commercial risks				

5. Nuclear fuel cycle Adverse

(NFC) product and changes in service market risk the pricing environment - - and demand on markets (Executives of the relfor natural evant Divisions of the uranium and Company) uranium conversion and

services

electricity

prices

- Management approaches:
- Maintaining an optimal balance between market-focused and escalation pricing (benchmark price inflation) in contracts;
 - Embedding quantitative flexibility and options in contracts with suppliers to align purchase and sales volumes;
- Discussing the volume of future orders with customers in advance:
- Promoting products in new market segments;
- Improving the technical and economic characteristics of nuclear fuel: developing new types of fuel:
- enrichment - Establishing partnerships in the form of joint ventures (JVs) with foreign suppliers of NFC products and services;
 - Using long-term pricing mechanisms; aligning pricing mechanisms used for procurement and those used in contracts with a high level of commodity risk:
 - Taking into account the current market performance and established operational limits in the course of operations;
 - Product supply diversification. Searching for partners in friendly iurisdictions:
 - Exploring opportunities for concluding additional commercial contracts on the spot market to mitigate the risk;
 - Accelerating product shipments, optimising working capital, including faster receipt of payments from counterparties.

Results:

By implementing the above measures and taking advantage of opportunities offered by a rise in product prices, the Company was able to mitigate the risk.

The risk level remains unchanged, as quotations for natural uranium and the separative work unit are currently low, which limits their downside, while creating an upside if the market environment improves.

6. Electricity and Adverse capacity market risk changes in

(Director General of JSC Rosenergoatom) Management approaches:

- Participating in the working group on forecasting hosted by the Association NP Market Council;
- and capacity Monitoring price drivers;
 - Updating price forecasts on a monthly basis.



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Risks and changes in risk levels (risk owners)

Operational risks

7. Risk of a decrease Decrease in in power generation ----

(Director General of JSC Rosenergoatom) Risk management practices

Results:

Risk description

Agreement was reached with the Association NP Market Council to submit an additional forecast taking into account the predominance of nuclear power sales in the region, which makes it possible to provide the most accurate forecast for electricity prices on the dav-ahead market (DAM) for NPPs. Given the challenging economic situation, the risk of a decline in consumption, which is one of the DAM price drivers, is increasing. The impact of wind and solar power generation capacities commissioned as part of the Integrated Power Systems of the North-West and the South cannot be fully reflected in the forecast due to limited statistics on electricity output, but in certain periods of 2022 they made a significant contribution to a decrease in electricity prices. The likelihood of materialisation of the above risks will increase in 2023.

Management approaches:

- In order to improve NPP safety, reliability and resilience, prevent equipment failures, meet the load schedule and achieve the
- target for power and heat supply while meeting the established schedule of repairs at NPP power units, to accelerate efforts to achieve key targets for power generation, and in order to systematise efforts aimed at ensuring that NPP managers assume a greater personal responsibility, the relevant orders were issued in 2022:
- Scheduled repairs of NPP power units are carried out annually in accordance with the approved schedule; NPP life extension and equipment upgrade programmes are implemented to increase installed capacity and power generation at operating power units (including the possibility of power units operating at above nameplate capacity).

Results:

In 2022, nuclear power generation reached a record high of 223.4 billion kWh, totalling 102.5% of the balance target set by the Federal Antimonopoly Service (FAS) of Russia and 100.4% of electricity output in 2021. The capacity factor stood at 86.21% in 2022. Russian NPPs forming part of the Unified Power System of Russia accounted for 19.9% of the total electricity output within the Unified Power System of Russia. 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.

The implementation of risk management measures and the use of RPS tools make it possible to offset the impact of negative factors.

For details, see chapter 4 'Performance of Divisions'.

Risks and changes in risk levels (risk owners)

8. Health, safety and Major environmental (HSE) accidents/ risks in nuclear enterprises

(Executives of the Company's Divisions)

Management approaches:

Risk management practices

 Occupational safety and health monitoring in nuclear organisations, including inspections and preventive visits, development of action plans and implementation of risk mitigation measures; 4

- Implementation of measures to improve HSE performance in the enterprises, including measures to enhance occupational safety, reduce the impact of the Company's operations on the health of the local population and prevent irreversible changes in the natural environment in the towns and cities where nuclear facilities are located;
- Measures to upgrade process equipment and improve production processes in the enterprises;
- Monitoring of individual radiation risk exposure of employees and measures to reduce it;
- Monitoring of the radiation level and the environmental situation in JSC Atomenergoprom's regions of operation;
- Constant readiness of emergency and incident response teams and equipment;
- Special reserve funds formed by ROSATOM to ensure safety at all stages of the life cycle of its production facilities;
- Arranging civil liability insurance against damage resulting from accidents for enterprises that own hazardous industrial facilities;
- Calculation and monitoring of indicators used for assessing the probability of potential negative impacts of industrial safety violations at hazard class 1 and 2 industrial facilities;
- Timely updates to internal regulations of the organisations, as required by legislation and federal rules and standards;
- Technical inspection of equipment used at hazardous industrial facilities;
- Maintaining a high level of professionalism, accountability and safety culture among employees, including certification of operating personnel at hazardous industrial facilities;
- Continuous monitoring of the use of personal protective equipment by employees in the workplace;
- Improvement of project management practices in the sphere of occupational safety and health.

Results:

Safe operation of JSC Atomenergoprom's organisations, including hazardous industrial facilities.

For details, see chapter 8 'HR Policy and Social Responsibility' and chapter 9 'Safe Operation'.

Risks and changes in risk levels (risk owners)	Risk description
9. Risk of loss of and	Corruption
damage to assets	and other
	offences
	leading to a
(Asset Protection	damage to/
Department of	loss of assets

ROSATOM)

Risk management practices

Connection with strategic goals

Management approaches:

 – JSC Atomenergoprom and its organisations have adopted an industry-wide system for the prevention of corruption and other offences.

loss of assets Results:

Pursuant to the National Anti-Corruption Plan for the period from 2021 through 2024 (Decree No. 478 of the President of the Russian Federation dated 16 August 2021), the Anti-Corruption Plan of ROSATOM and Its Organisations was approved for the relevant period; it supports corruption risk management, including the following focus areas:

- Continuous assessment of corruption risks across all business processes implemented in the Company and all accounting events;
- Professional development of employees focused on combating corruption, with priority given to the following employee categories:
- Employees newly hired by the Company and its organisations and appointed to positions involving responsibility for compliance with anti-corruption standards;
- Executives that have been assigned responsibility for preventing corruption in the organisations;
- Employees involved in the procurement of goods, work and services;
- Introduction of online anti-corruption training based on mobile platforms accessible to every employee in the industry;
- Reporting evidence of corruption and other offences, including through feedback mechanisms (the hotline);
- Reviewing and updating industry-wide regulations on asset protection and combating corruption in line with updates to anti-corruption legislation;
- $-\,$ Detection, timely prevention and settlement of conflicts of interest
- Prioritised implementation of industry-wide anti-corruption regulations in new businesses.



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S

10. Reputational risk Changes in stakeholder - - perception of the trustwor-(Communications thiness and Department of appeal of the **ROSATOM** and Company Heads of Divisions)

Risk description

and its or-

ganisations

Risks and changes

in risk levels

(risk owners)

Management approaches:

Risk management practices

- Measures to shape a positive public opinion on the development of the Company's technologies and projects (both nuclear and
 - non-nuclear) through improved information transparency and open stakeholder engagement (including the functioning of an industry-wide public reporting system);

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Continuous efforts to improve the recognition and appeal of the Company's HR brand (both in the industry and among prospective employees and within the expert community);

- The Company 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;
- The Company implements projects in the sphere of communication and the humanities in cooperation with foreign partners. It has successfully introduced the practice of holding online events in overseas organisations and virtual tours. The Company continuously monitors public opinion on NPP construction and information on the decisions of government and regulatory bodies on curtailment of nuclear power generation in the countries where the Company is implementing projects;
- Technical tours and media tours of Russian nuclear facilities for foreign media representatives;
- Maintaining a presence on social media: the number of followers of the Company's official community pages on social media is growing steadily, with the largest increase in the number of followers recorded for social media platforms focused on visual content;
- Participation of the Company's representatives in international trade fairs as speakers/delegates:
- Production of printed materials to raise public awareness about the nuclear power industry.

Results:

Projects implemented in Russia and abroad are supported by governments. In 2022, the reputation score of companies in the nuclear industry (an indicator whose calculation takes into account the results of opinion polls) stood at 3.7 (2021: 3.5). There was no significant increase in the level of reputational risk in 2022.

For details, see chapter 8 'HR Policy and Social Responsibility'.

Risks and changes in risk levels (risk owners)	Risk description
11. Project risk (Executives of the Company's Divisions)	Changes in the macro- economic indicators of the countries participat- ing in the

projects;

failure to

fulfil their

ments with

the schedule

and quality

performed

regard to

commit-

contractors'





Management approaches:

- Full-cycle risk management applied in NPP construction projects, including risk identification and assessment, development and implementation of risk management measures, risk monitoring,
- updates to the risk register, and reporting;
- Improving project management and risk management systems; - Negotiating the main terms and conditions of contracts with cus-
- tomers in advance:
- Developing risk maps for new business areas;
- Regular monitoring and control of achievement of key milestones, financial and physical targets for overseas projects;
- Regular monitoring and communication with customers concerning the schedule for NPP maintenance and training of foreign NPP personnel abroad, as well as other matters related to the imple-
- mentation of overseas projects: Implementing best project management practices (including
- of work to be ROSATOM's industry-wide risk management system and the TCM NC cost and schedule management methodology) and industry-wide guidelines for projects and investment activities in project companies:
 - Steps taken both by shareholders and at the operational level to enhance risk-based project management;
 - Improving project management practices;
 - Developing action plans for engagement with foreign customers;
 - Concluding long-term contracts and locking in electricity prices;
 - Developing standardised design solutions
 - Implementing a programme to reduce the cost and duration of NPP construction;
 - Implementing procedures forming part of an industry-wide approach to managing risks associated with NPP construction projects;
 - Using opportunities for the redistribution of available credit resources between projects;
 - Concluding agreements that impose penalties for the full or partial repudiation of commitments:
 - Developing alternative projects meeting the established criteria;
 - Concluding long-term offtake contracts.



ion wit



Risks and changes in risk levels (risk owners)

Risk description Risk management practices

Results:

Risk management measures implemented by the Company have enabled it to avoid a negative impact on key performance indicators. For key components that are no longer unavailable, alternative suppliers have been found, and further steps are being taken to replace imports. Project implementation stages are monitored in real time; RPS methodologies are being implemented. The Company is expanding its product portfolio (offers) and entering new end markets, including by establishing JVs and acquiring the relevant assets. Procurement of imported equipment is brought forward, with prices locked in and the warranty period extended. The risk is expected to rise due to the lengthening of supply chains and the fact that major suppliers of IT equipment have left the Russian market because of sanctions pressure.

12.Climate and envi-	Risk of loss of	Management approaches:				
ronmental risks (Executives of the Company's Divisions)	and damage to proper- ty due to the impact of random natural and climatic factors. Risk of en- vironmental damage from the operation of nuclear facilities and other facil- ities in the industry	 At the stage of NPP design, the Company carries out a comprehensive assessment of risks associated with the climatic characteristics of the region where the proposed NPP construction site is situated; Implementation of industry-wide policies on sustainable development and environmental protection. Taking into account adverse natural phenomena (including earthquake tendencies) and climatic factors at the design stage. Industrial environmental control and monitoring; Parameters of the NPP construction site are continuously monitored; Environmental monitoring is performed, including radiation monitoring at the NPP construction site and in the radiation control area using mobile radiation monitoring equipment at ARMS stations in accordance with the Environmental Radiation Monitoring Programme; Annual reports presenting the findings of site monitoring, environmental and radiation monitoring are published on an annual basis. Annual reports are submitted to the Nuclear Regulatory Authority of Turkey (NDK), the general design contractor (JSC Atomenergoproekt) and the holding company (JSC REIN); Steps are being taken to determine the zero background radiation level at the NPP construction site; To maintain the balance of local ecosystems, all enterprises involved in various stages of the production process strictly comply with technological standards for natural uranium mining and process-ing. Active steps are being taken to reduce the relevant impacts and improve the environmental safety of the production cycle. 	1			

Risks and changes in risk levels (risk owners)

cal risks in the regions approval for of operation the location ture facilities

(JSC Atomenergoprom and executives of the Company's Divisions)



Results:

Risk description

Pollutant emissions into the atmosphere from NPPs do not exceed permitted limits and are significantly below the limits set by environmental regulators. The majority of pollutant emissions from NPPs are generated by start-up and backup boiler houses, boiler houses of healthcare centres and backup diesel generators, which are regularly started up for routine testing.

For many years, NPPs account for less than 0.01% of the total volume of pollutant emissions into the atmosphere from Russian enterprises.

Despite the progress that has been made, NPPs continue to regularly implement measures to reduce the man-made impact on the atmosphere: the Company is improving technological solutions to enhance fuel efficiency at its facilities; higher-grade fuel oil (with lower sulphur content) is used; painting techniques are being improved; efficient gas scrubbers and dust collectors are put into operation.

13. Social and politi- Loss of public Management approaches:

- JSC Atomenergoprom operates in a socially important sector of the economy. The Government of the Russian Federation makes a of infrastrucdirect impact on the Company's operations by financing individual
 - federal projects and federal target programmes. As a result, JSC Atomenergoprom and its organisations are characterised by a high level of financial resilience sufficient to withstand the negative economic consequences of social and regional risks;
 - The Company engages with regional and municipal governments on matters related to promoting regional development, increasing regional tax revenue and maintaining social and economic stability in the regions;
 - In order to reduce social risks in its regions of operation, the Company implements a set of measures (public consultations. engagement with non-governmental organisations and the media) to inform the general public about the operations of its regional manufacturing enterprises, plans for their future development and their stability, and the fact that its operations do not pose any environmental risks;
 - Simultaneously, the Company conducts environmental upgrades in the back-end segment, introducing new RAW and SNF processing technologies and reducing the volume and radioactivity of waste.

Result: the situation in the towns and cities where the Company operates remains stable. Operational continuity has been ensured in the Company's enterprises.

Other risks

Licensing risks

JSC Atomenergoprom currently has all the required licences. Where necessary, the Company can promptly obtain licences for new businesses and renew existing licences.

Logistical risks

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

Risk insurance

Risk insurance is one of the main risk management approaches used by JSC Atomenergoprom. To improve the reliability of insurance coverage, in 2022, the Company continued to cooperate with the insurance community in order to insure Russian operators against property risks. A significant share of liability of Russian NPPs for potential nuclear damage was transferred for reinsurance to the Russian Nuclear Insurance Pool (RNIP) and the Russian National Reinsurance Company (RNRC). This proves that the insurance community acknowledges the safety and reliability of Russian NPPs to be adequate.

In 2023, the Company plans to continue to engage RNIP and RNRC experts to audit key enterprises in the industry for insurance purposes.

Objectives for 2023 and the medium term

Plans for 2023 include activities stipulated in the Risk Management Development Programme for the period from 2019 through 2024. The Programme 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 following three key objectives for the development of risk management in the Russian nuclear industry have been set for 2023:

- To develop an automated risk assessment and management system, which will, among other things. enable 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.

In 2023, the Company plans to perform activities in the URAN IRMS and activities forming part of the second stage of the URAN IRMS project (under the resolution of the Steering Board of the URAN IRMS project). Key activities forming part of the second stage will include the following:

- Science system of digital services and TCM NC:

7.3. FINANCIAL MANAGEMENT

Key results in 2022:

Implementation of the financial strategy

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

Cash flow management is centralised through:

- Industry-Wide Financial Policy);
- enables 100% control of funds in the industry:
- essentially a liquidity management centre;
- on a daily basis.

Targets set for 2022 in the financial strategy in terms of engagement with banks, debt portfolio management as part of the day-to-day operations and projects of the Company and its organisations, and further centralisation of financial transactions were met.

towards:

- Accumulating spare cash in the accounts of pool leaders⁵¹;

- Integration with the system supporting investment activities (the Sirius information system), the Digital

- Implementation of modelling and quantitative risk assessment tools.

 The Company placed a second issue of 'green' exchange-traded bonds worth RUB 9 billion. A total of RUB 46.64 billion has been saved in the industry through intra-group financing since 2010. The Expert RA rating agency confirmed the Company's credit rating at ruAAA with a stable outlook.

A single industry-wide legal framework regulating financial management (including the Uniform

 Vertical integration of treasury departments in the Company's subsidiaries and affiliates, which are functionally accountable to ROSATOM's Treasury Department. The established treasury structure

 Concentration of principal treasury functions of nuclear organisations in ROSATOM's Treasury Department, which communicates with nuclear organisations in a shared information space and is

 An industry-wide automated system for recording treasury transactions (the Corporate Settlement Centre Information System), which enables the recording of all treasury transactions across the group

In order to improve the performance of the treasury functions, in 2022, the Company continued to work

^{51.} A pool leader is an organisation of the Corporation on whose accounts spare cash is accumulated and subsequently redistributed between ROSATOM's organisations through loan agreements. The organisation performing the functions of a pool leader is appointed under the resolution of ROSATOM's executive bodies.

- Improving the accuracy of payment scheduling (a rolling liquidity forecast);
- Maintaining a competitive cost of servicing of the consolidated debt portfolio;
- Centralising treasury transactions (complying with the financial policy);
- Introducing project financing instruments as part of project implementation by the Company and its organisations.

In 2022, the Company continued to implement and expand the scope of the project focused on further centralisation of the treasury function, including the rollout of the Payment Factory at JSC Atomenergoprom (hereinafter referred to as the Payment Factory). This project is aimed at further improving the performance of the treasury function in the industry.

A total of about RUB 46.64 billion was saved in the industry through intra-group financing between 2010 and 2022.

Green bonds

In 2022, JSC Atomenergoprom placed the second issue of 'green' exchange-traded bonds (series 001R-02) with a par value of RUB 9 billion. The issue was placed as part of the series 001R exchange-traded bond programme worth up to RUB 100 billion inclusive. The bonds have a maturity of three years.

Proceeds from the bond placement have been used to refinance expenditure on the implementation of the Wind Power programme.

They were more than eight times oversubscribed. As the bond issue was oversubscribed, the Company was able to lower the coupon rate to 8.95% per annum, which corresponds to an effective yield of 9.15%.

The Expert RA rating agency acting as an independent verifier confirmed that the bond issue complied with the Green Bond Principles (GBP) of the International Capital Market Association (ICMA) and with the provisions of the Russian Green Finance Guidelines developed by VEB.RF.

Parties to the transaction included all categories of investors, such as banks, managers, investment firms and insurance companies; it also generated demand from individuals.

Earlier, in 2021, JSC Atomenergoprom placed the first issue of 'green' exchange-traded bonds (series 001R-01) with a par value of RUB 10 billion. The issue was placed as part of the series 001R exchangetraded bond programme worth up to RUB 100 billion inclusive. The bonds have a maturity of five years. This is the first placement of exchange-traded bonds by a Russian issuer to finance renewable energy sources.

Receiving and maintaining credit ratings

In the reporting year, JSC Atomenergoprom continued to take steps to the maintain the credit rating assigned by the national rating agency, JSC Expert RA.

As at 31 December 2022, the national rating agency JSC Expert RA confirmed the credit rating assigned to JSC Atomenergoprom at ruAAA with a stable outlook.

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

As part of its day-to-day operations and project activities, the Corporation successfully maintained the average interest rate on its total debt portfolio denominated in Russian roubles below 8.9% as at 31 December 2022. Despite turbulence on the Russian financial market amid unprecedented sanctions pressure on financial and industrial sectors of the Russian economy, throughout 2022, the Company maintained sufficient liquidity to ensure that it and its organisations operate normally and fulfil their contractual obligations on time.

JSC Atomenergoprom continued to obtain funding on preferential terms, including for the implementation of digital transformation projects. These are aimed at improving management efficiency in the nuclear industry and implementing domestically produced IT solutions that do not rely on imported technology as part of a subsidy programme run by the Ministry of Digital Development, Communications and Mass Media of the Russian Federation pursuant to Decree No. 1598 of the Government of the Russian Federation dated 5 December 2019.

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

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

- Sakha Republic at the 2022 Eastern Economic Forum;

- principles of the Project Finance Factory).

- As part of the development of a concession model for the financing of construction of a pilot small nuclear power plant in the Sakha Republic (Yakutia), an agreement on the implementation of a zerocarbon nuclear power generation project in the Arctic zone of the Sakha Republic (Yakutia) in the form of a public-private partnership was signed with the Ministry for the Development of the Russian Far East and Arctic at SPIEF 2022, and an agreement on cooperation in the development of a mineral resource centre in the Arctic zone of the Sakha Republic was signed with the Ministry for the Development of the Russian Far East and Arctic, the Ministry of Natural Resources and Environment and the Head of the

- Financial documents were signed to finance the construction of three industrial facilities as part of the implementation of the Infrastructure for the Management of Hazard Class 1 and 2 Waste Federal Project. Loans to be provided by the financial partner will total RUB 22.1 billion. The project involves setting sustainable development targets, the achievement of which will result in a decrease in the cost of financing;

- As part of the project to build the multipurpose fast neutron research reactor (MBIR), conditions precedent were met for obtaining project financing, and the first drawdown was made under the syndicated loan agreement based on the principles of the Project Finance Factory (pursuant to Decree No. 158 of the Government of the Russian Federation dated 15 February 2018), with the target amount of funding to be raised from the banks totalling RUB 23.3 billion;

 A dedicated consortium of banks was formed to finance a project to build a plant that will produce lithiumion batteries and energy storage systems in Russia (under a syndicated loan agreement based on the

Plans for 2023 and for the medium term:

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

7.4. INVESTMENT MANAGEMENT

Key results in 2022:

- The investment programme was 83% completed (+7 p.p. compared to 2021).
- Return on the investment portfolio stood at 16.7% (+0.1 p.p. compared to 2021).

Key approaches to investment management:

- A distributed system has been built for investment decision-making by the governing bodies of ROSATOM, the Company and its organisations; it is aligned with the distribution of competence centres in the industry;
- A phase-gate approach is applied to project implementation, with decisions on key milestones made in a staged process;
- Key projects are monitored at the corporate level;
- Investment decisions related to day-to-day operations of assets are delegated to the Company's organisations in order to speed up the decision-making process;
- To improve the quality of investment decision-making, opinions of experts independent from the project initiator are taken into account;

- The Company's project portfolio is built as a set of projects of organisations in the industry for a year and for the medium term based on available investment resources and the required rate of return:
- Experts are engaged to perform an in-depth probabilistic risk analysis for significant projects; the findings of analysis are incorporated in the decision-making system;
- A comprehensive audit is conducted, which helps to formulate recommendations on how to improve project planning and implementation;
- Measures to raise external financing for projects are being developed.

Results in 2022

Breakdown of investments in significant projects



52. Including the investment programme of JSC Rosenergoatom. 53. Calculated for the period from 2022 through 2099

- In 2022, the investment programme of the nuclear industry was 83% completed⁵².
- Performance against the targets of the investment programme (including in the Divisions) increased by 7 percentage points compared to 2022 due to the gradual lifting of COVID-related restrictions.
- At the same time, overall return on the investment portfolio stood at 16.7%⁵³.

Measures to improve investment efficiency

In the reporting year, employees in the industry continued to develop their competences at the Project Management School. 306 people underwent assessment, subsequent training and certification in 2022.

Investment processes were adapted, given the need for prompt response amid the deteriorating international situation: project ranking criteria for building the project portfolio were revised: review and approval processes for import substitution projects were simplified.

Given external restrictions imposed on the Russian Federation in 2022, the Company restructured its project portfolio in order to minimise risks. Projects exposed to risks related to the actions of unfriendly countries were refocused on the Russian Federation and/or friendly countries in terms of supplies (equipment and components required for implementation) and revenue generation.

The Company adopted an approach to the financial autonomy of its Divisions depending on the level of risk involved in investment projects. It enables JSC Atomenergoprom to monitor projects that are the most significant in terms of risks and at the same time to speed up investment decision-making by delegating projects not involving risks to which JSC Atomenergoprom is exposed to the level of Financial Responsibility Centre 2.

The project to reduce red tape in the investment process produced the first results: the project review process was streamlined; a new project manager tool for verifying the completeness and content of project data sheets was introduced; a network scheduling tool based on standard office software was developed to replace specialised IT systems.

The Investment Strategy tool was operationalised in Financial Responsibility Centre 2; this is an additional medium-term investment and project planning tool that contains information on focus areas of investment activities and organisations in the industry that are participating in them. The tool was incorporated into the overall industry-wide investment strategy.

A project to migrate the Sirius information system (project portfolio management) to a new software platform that does not rely on imported technology has been approved and is being implemented in accordance with ROSATOM's plans.

Plans for 2023 and for the medium term:

- To continue to reduce red tape in investment and project processes and to develop project methodology on a systematic basis;
- To align the medium-term investment planning mechanism (investment strategy) with strategic and budget planning tools and schedules;
- To expand the practical application of road maps in portfolio investment management;
- To adjust project execution plans in order to minimise the lag caused by COVID-19 pandemic restrictions imposed in 2021 and the deterioration of the international situation in 2022;
- To increase the level of digitisation of projects and investment activities.

7.5. INTERNAL CONTROL SYSTEM

Kev results in 2022:

The internal control system in ROSATOM and its organisations (including JSC Atomenergoprom) is based on:

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

and in subsidiaries.

- 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;
- the SICBs.

Results in 2022

system:

- Methodological Approaches to the Internal Audit of Performance of the System of Internal Controls in Business Processes were developed;
- The application of incentives for SICB employees who have special knowledge (expertise and practical experience) and act as competence centres in the Divisions was examined taking into account performance in 2021;
- leadership model;
- Progress was made in the development of control activities in terms of assisting the business in the achievement of sustainable development goals.

 Based on the findings of monitoring, internal control performance was highly rated by internal customers (with a score of 6.4 out of 7 against a target of 5.7).

- The COSO model (The Committee of Sponsoring Organisations of the Treadway Commission);
- The Company's internal control system covers all organisations of JSC Atomenergoprom. The Company recognises the importance of building and improving the internal control system both in the parent company
- Key characteristics of the work of specialised internal control bodies (SICBs) in JSC Atomenergoprom's organisations, which perform internal control and audit functions in the Company, include the following:
- Growing demand from executives in the Company's organisations for advisory services provided by

The following measures were implemented in the reporting year in order to improve the internal control

The SICBs of the Company's organisations assumed greater responsibility through an updated

For the SICBs to provide reasonable assurance regarding the achievement of the strategic goals of the nuclear industry, the following steps were taken in 2022:

- Financial and business audits were focused on monitoring the implementation of projects and strategic programmes and minimising material risks;
- The percentage of significant instances of non-compliance with sustainability guidelines adopted in the industry in audited organisations decreased by 64% compared to 2021;
- Measures were implemented to minimise operational risks related to sanctions.

Online meetings of internal auditors and controllers in the nuclear industry are held on a monthly basis in order to share best practices and practical experience in the sphere of internal audit, risk management and internal control (every event is attended by more than 180 people; more than 13 events were held in 2022).

An assessment of compliance with the professional standard for internal control officers (internal controllers) was carried out for 150 SICB employees.

Outcomes of inspections conducted by the SICBs in 2022

In the reporting year, the SICBs conducted 497 inspections in the Company's organisations. Following the inspections, 1,769 corrective measures were developed and approved for implementation.

Based on the findings of inspections conducted in 2022, disciplinary sanctions were imposed on 247 employees of the Company's organisations, including four senior managers.

Stakeholder control

The Company continues to operate the Partner Special Monitoring and Analytics Unit designed for integrating information systems across the industry in real time; it contains full information on complaints regarding procurement processes in the nuclear industry, as well as indicators for online monitoring of procurement procedures.

The Company continues to maintain a public information system for calculating the business reputation score of suppliers, which is one of the key risk assessment tools used in the course of procurement in the nuclear industry. The Uniform Industry-Wide Guidelines for Assessing the Business Reputation of Suppliers were updated. The information system for calculating the business reputation score of suppliers was migrated to modern software that does not rely on imported solutions; the recording of negative information on certain grounds was automated through integration with information systems applied in the industry.

The Company carries out methodological work to produce recommendations and proposals for improving procurement processes in the nuclear industry based on the findings of investigation of complaints. A methodology was developed for monitoring current procurement procedures.

Webinars are held for employees of the procurement function and controllers; they are focused on the most frequent issues and irregularities in the sphere of procurement.

As part of advisory activities, explanatory letters on individual issues are sent to customers to prevent similar violations; advisory support is provided to employees in procurement departments regarding the application of provisions of the Uniform Industrial Procurement Standard (UIPS) and the business reputation score of suppliers; a Q&A forum for employees in the industry has been put into operation as part of the Partner Special Monitoring and Analytics Unit.

The Central Arbitration Committee and the arbitration committees of the Divisions received 407 reports (complaints) from stakeholders regarding violations of procurement rules established by Russian legislation. the UIPS and other regulations of ROSATOM and its organisations supporting the UIPS. 243 complaints were investigated: 54 complaints (22.2% of the total number of investigated complaints) were deemed to be valid. Other complaints were withdrawn by complainants or were dismissed on the following grounds:

- Antimonopoly Service;

Systematic efforts of the arbitration committees (including detailed explanations provided to customers/ procurement authorities during the investigation of complaints concerning the nature of detected violations), the publication of biannual practice reviews and a library of arbitration practices maintained on the official procurement website of the nuclear industry have helped to minimise the number of violations in the procurement process. Following the investigation of complaints, a proposal was submitted to the Central Arbitration Committee, and steps were taken to enable foreign bidders to participate in the procurement process.

In addition, the Central Arbitration Committee reviewed 12 complaints related to the calculation of the business reputation score of suppliers (all complaints were found to be invalid).

Plans for 2023

In 2023, efforts aimed at improving the performance of governance and internal control systems in JSC Atomenergoprom and its organisations and further enhancing control activities will involve implementing a set of measures, including the following:

- Mastering project audit and strategic audit practices;
- Practising continuous auditing techniques;
- of sustainable development;
- Digitisation of control activities;

- supplier verification.

Because the deadline for filing the complaint had expired;

Because a similar complaint had been accepted for investigation or investigated by the Federal

 Because the complainant was not entitled to file a complaint (after the deadline for submitting bids has expired, complaints may only be filed by bidders that have submitted a bid):

 Because the defendant had taken corrective measures to address the violation before the complaint was investigated by an arbitration committee.

- Developing control activities with a focus on improving the maturity of the industry in the sphere

- Automation of the information system for calculating the business reputation score;

- Establishing an integrated nationwide system for assessing business reputation, with a single methodology centre at the Competition Policy Monitoring Office;

- Investigating complaints concerning procurement transactions made using the BRIEF solution and

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HR POLICY AND SOCIAL RESPONSIBILITY

RUB 326.3 BILLION TOTAL PERSONNEL COSTS **OF JSC ATOMENERGOPROM**

HR POLICY AND SOCIAL RESPONSIBILITY 8

8.1. PERSONNEL MANAGEMENT

Kev results in 2022:

- The average monthly salary totalled RUB 115,600.
- 29.2% of employees were aged under 35.
- 72 graduates of core universities were hired by the Company.

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

GRI 2-7 In 2022, JSC Atomenergoprom and its organisations employed 176,100 people⁵⁴.

106,200 employees have a university degree

1,604 employees are Candidates or Doctors of Sciences.



The male/female ratio in the Company is determined by the nature of the industry.

The age of employees averaged 42.9 years.

29.2% of employees were aged under 35.

54. Average headcount.

- dent contractor agreements totals 196 people.
- age headcount.

 - ployees⁵⁵.

 - Moscow and the Moscow Region: over 42,000 people;

 - Sverdlovsk Region: over 10,000 people;
 - Voronezh and Kursk Regions: over 9,000 people each;
 - Rostov Region: over 8,000 people.

JSC Atomenergoprom's organisations operate in 28 foreign countries, where they employ 6,400 people⁵⁶ (3.6% of the Company's total headcount), with the highest headcount in the following countries:

- Turkey: more than 3,600 people;

Personnel costs

In 2022, personnel costs totalled RUB 326.3 billion⁵⁷, up by 38.8% compared to 2021. Costs per employee increased from RUB 1,686,600 in 2021 to RUB 1,838,800 in 2022 (up by 9%).

Structure of personnel costs, %



Payroll

Insurance contributions

Social and other expenses (includin

GRI 2-8 The average number of employees of JSC Atomenergoprom and its organisations working under indepen-

GRI 401-1 In 2022, JSC Atomenergoprom and its organisations hired 40,152 people, which totals 22.8% of the aver-

20,035 employees were dismissed in 2022; the personnel turnover rate stood at 11.4%.

JSC Atomenergoprom's organisations operate in 70 regions of Russia and have a total of 173,400 em-

The Company's organisations with the highest headcount are situated in the following regions:

Saint Petersburg and the Leningrad Region: over 17,000 people;

- CIS countries (Republic of Belarus, Republic of Kazakhstan, etc.): over 1,500 people.

	2020	2021	2022
	74.9	74.9	75.5
	20.9	20.3	19.9
g training)	4.2	4.8	4.6

57. Including payroll costs, social expenses, expenditure on personnel training, development and evaluation, and other personnel costs.

^{55.} For details, see Appendix 3

^{56.} For details, see Appendix 3.

GRI 3-3 Performance management

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

The Deputy Director General for HR of ROSATOM is also responsible for HR management in JSC Atomenergoprom.

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

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

The performance management process is automated through an integrated industry-wide system, RFCORD⁵⁸.

Remuneration system

The Company's current remuneration system:

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

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.

In accordance with the requirements of the Integrated Industry-Wide Remuneration System and the Uniform Industry-Wide Performance Management Policy, the size of the annual bonus paid to employees depends on achieving KPI targets and reflects progress in achieving the key performance targets of the Company and its organisations.

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

In 2022, the average monthly salary per employee of JSC Atomenergoprom increased by 9.8% compared to 2021 and totalled RUB 115,600 per month.

Executive succession pool

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

In order to select development programmes that are best suited to the target positions of ESP members. the ESP is divided into four levels:

- ROSATOM's Capital (middle-level executives):

Since the establishment of the executive succession pool, the number of its members has exceeded 5,900.

Number of ESP members with a breakdown by gender



Women 1.093

Appointments of ESP members to a new position, %⁵⁹



Share of ESP members appointed to positions (top 30 and top 1,000 exe

Share of ESP members among senio appointed to a new (management)

of strategic goals.

59. Since 2018, the calculation of the indicator has changed: the promotion of succession pool members was assessed based on the number of ESP members appointed to new positions over the last three reporting years. In 2019, 2020 and 2021, the assessment focused on the share of promoted ESP members who had been included in the ESP in 2018, 2019 and 2020 respectively.

ROSATOM's Assets and ROSATOM's Assets. Basic Level (top and senior executives);

ROSATOM's Talents (promising specialists and junior executives).

92% of ESP members were appointed to a new position by the end of 2022.

2020		2021		2022		
	Share	Number	Share	Number	Share	
	78%	4,279	77%	4,614	78%	
	22%	1,186	23%	1,306	22%	

	2020	2021	2022
o vacant top and senior executive ecutives in the industry)	68.17	70.37	70.82
or, middle-level and junior executives position	79.65	91.2	92

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

^{58.} For details, see: https://strana-rosatom.ru/2019/06/25/poshli-na-rekord/

Training as part of ESP development programmes

	Develop-		Number of participants ⁶⁰		
ESP level	gramme	key training topics	2020	<mark>2</mark> 021	2022
Coning even tives	ROSATOM's Assets	Shaping the Future, Virtuosos of Management, Communication in Times of Change, Marketing, Finance	368	391	416
Senior executives	ROSATOM'sStrategy, Leadership and PeopleAssets. BasicManagement, Change Management andLevelHorizontal Interaction, Marketing, Finance		368	427	491
Middle-level executives	ROSATOM's Capital	Leadership and Project Management,	2,060	2,271	2,448
Junior executives	ROSATOM's Talents	Management, Situational Leadership	2,215	2,376	2,565
Total			5,011	5,465	5,920

Successor assessment

An innovative approach to assessing high-potential employees has been introduced in order to improve the guality of succession plans and the transparency of employee promotion processes. Executives are involved in talent assessment and are responsible for developing succession plans. This helps to reduce the duration and cost of assessments. In order to share experience and ensure that decisions are made objectively, the assessment methodology involves the possibility of cross-functional or cross-divisional cooperation, whereby executives participate in the assessment of other executives who are candidates for managerial positions. Succession candidates are assessed in terms of their commitment to corporate values, the relevant professional and managerial experience and knowledge, motivation and potential.

In 2022, 2,857 candidates for executive positions in all of the Company's core Divisions (more than 80 organisations) were assessed by executives of the organisations and holding companies.

The methodology is based on the best practices adopted in major international companies and was piloted in 2018.

Career counselling

To achieve the goal of being the best in unlocking talent in accordance with ROSATOM's 2030 Vision, individual career counselling has been provided since 2020. This service helps employees to identify their strengths, decide on their next career move and initiate a career development discussion with their manager. There are currently 54 career counsellors working in the industry. A retraining programme for HR specialists has been developed and piloted. The programme offers a fast and effective way to expand the pool of career counsellors in the industry.

In 2022, 1,678 consultations were held in more than 70 organisations in the industry. In 2022, the service was highly rated by the employees (84% would recommend career counselling to their colleagues). Counselling is available both offline and online. In addition, the service provides support to employees going through a career crisis and helps them to shape their future career strategies.

Employee training

The development of employee competences is a major priority of JSC Atomenergoprom's HR policy.

131,200 employees of JSC Atomenergoprom and its organisations underwent training or retraining or completed professional development programmes in 2022.

in 2022.

by employee category



Executives

Specialists and white-collar workers

Blue-collar workers

by employee gender

	Employee gender	2022
	Female	33.76
	Male	55.16
GRI 404-2	Training for specialists and executives in the indus	try is provided primarily by the Autonomous Non-Profit

development.

The portfolio of the Rosatom Corporate Academy comprises more than 550 training programmes, including online and video courses, face-to-face and mixed-format programmes. A variety of training formats are used. They include conventional, innovative and even experimental ones, for instance, the edutainment format, which helps to make training exciting, or My Best Mistake sessions, during which managers tell trainees about those mistakes from which they have been able to learn. Yet another example of an experimental format is immersive oculography: employee training and testing through simulation of a workplace situation in virtual reality.

The number of training hours per employee in JSC Atomenergoprom's organisations averaged 49.04 hours

Annual average training hours per employee in JSC Atomenergoprom's organisations

	2020	2021	2022
	60.2	81.4	77.2
5	34.8	50.7	43.8
	44.0	61.9	45.7

GRI 404-2 Annual average training hours per employee in JSC Atomenergoprom's organisations

Organisation Corporate Academy of State Corporation Rosatom (hereinafter referred to as the Rosatom Corporate Academy), including its new venue, the Andrey Sakharov Cultural and Education Centre Mavak Academy, and the Autonomous Non-Profit Organisation Rosatom Technical Academy (hereinafter referred to as the Rosatom Technical Academy). Currently, both Academies are full partners of ROSATOM in achieving its strategic objectives; they implement projects directly relevant to prioritised areas of business

^{60.} The number of participants included in the ESP is shown as a cumulative total for the period from 2017 through 2022.

The Rosatom Technical Academy specialises in continuing professional education and retraining of executives and specialists in the nuclear power industry. It is ROSATOM's educational, research and guidance centre focused on the safe use of nuclear energy, state security, operational and supporting processes. In addition, the Rosatom Technical Academy is an international platform for knowledge sharing and competence development in the nuclear industry; it also acts as a technology integrator providing training for the personnel of nuclear power plants.

GRI 403-5 The portfolio of the Technical Academy comprises more than 400 continuing professional education programmes focused on nuclear and radiation safety, industrial safety, information security, occupational safety and health, NPP operation, design and construction, IT solutions that do not rely on imported technology, etc.

In 2022, the Company continued to develop distance learning and e-learning formats.

The share of distance learning stood at 37%.

Digital competences and culture

To achieve technological leadership, the Company continued to take steps to improve digital literacy among both JSC Atomenergoprom's employees and school and university students.

Activities of Change Support Teams

JSC Atomenergoprom has a tradition of supporting 'bottomup' initiatives and thus enabling talented employees to fulfil their potential. Change Support Teams (CSTs) comprise proactive employees who implement projects to drive changes. Participation in the CSTs not only enables them to put their ideas into practice, but also provides an informal channel for prompt and direct communication with industry executives. In turn, this provides employees with new career opportunities and becomes an effective tool for developing future leaders at the local level. In 2022, more than 6,600 employees in the industry were involved in change projects through the CSTs. They took part in 64 new projects supporting the Company's key initiatives. 611 change experts were trained. Further steps were taken to develop the competences of workers and engineers. The focus of the work remains on assisting the participants of the movement in developing their change management and project management competences.

41,877 people underwent digital literacy training in 2022.

The amount of training (measured as the number of participants multiplied by the number of completed courses) as part of a programme to assist end users in the transition to domestic software (Astra Linux and My Office) totalled 154,399 person-courses.

Two programmes were implemented to support the development of digital competences of executives of the Company's enterprises: the Digital Production Management programme run jointly with Peter the Great St. Petersburg Polytechnic University and the Digital Transformation Management programme targeted at top-level CDOs (the coverage of the programme exceeds 250 person-courses).

In addition, in 2022, a new event was held for IT specialists: the IT Core conference, where representatives the country's largest companies discussed the role of digital specialists in ensuring Russia's technological sovereignty, as well as matters related to cooperation between enterprises and students and teachers in the training of IT specialists.

Employee training is accessible 24/7 through the RECORD Mobile training platform. It is available as both a mobile app and a web app. Overall, in 2022, users of the platform completed 1,188,182 courses totalling 1,351,230 man-hours (13% more than in 2021). The user satisfaction rating stands at 4.2 out of 5 points.

In order to develop the Employee's Personal Account service (an online HR service), in 2022, a mobile version of the Employee's Personal Account was piloted in six organisations with a total headcount exceeding 15,000 people. The application can be used by workers and employees who have no access to desktop computers.

The Digital Assistant Mark corporate service is a chatbot that enables employees to get a prompt response on popular services online (to find out the remaining leave, to file a leave application or a business trip request, to request a proof of income or copies of employment records, to contact the technical support for IT services, to recover the account password). It recognises questions in a chat with an employee (in the form of text or voice messages) and finds answers to them (for instance, about training, annual assessment, voluntary health insurance, etc.). The service is available in 85 organisations in the industry and has been used by 37,000 employees. The user rating stands at 4.2 out of 5 points.

The Digital Recruitment corporate service, which includes an integrated career portal of the nuclear industry (https://rosatom-career.ru), is a digital platform for the recruitment and hiring of candidates. The career portal lists available vacancies, internships, work placements, as well as announcements of events for young people. In 2022, the career portal was visited by 750,000 people, with 31,000 people responding to vacancies. More than 2,500 vacancies have been posted simultaneously on the career portal. More than 80 organisations of the industry have access to the service.

In 2022, the functionality of the Rosatom LIFE corporate social media platform was expanded. This is a digital platform for communication and teamwork that enables employees to create professional communities, find experts for their project teams, share knowledge, conduct surveys, manage tasks and use the event calendar. Since its launch, the platform has been used by 55,000 employees, and 900 communities have been created. The user rating stands at 4.3 out of 5 points.

Participation of employees in external and industry-wide professional competitions: Leaders of Russia

Employees of JSC Atomenergoprom and its organisations actively participate in the Leaders of Russia national management competition.

1,083 industry executives took part in the fourth season of this competition; three employees of JSC Atomenergoprom (including two women) won the super finals.

Competitions and professional events

Employees in the nuclear industry achieved impressive results in professional events and competitions. The Corporation's team (including representatives of JSC Atomenergoprom's organisations) topped the medal table of the High-Tech International Competition of High-Technology Professions for the eighth time. More than 230 employees from 10 divisions in the industry, as well as students and teachers from NRNU MEPhI took part in the competition. The team members won a total of 61 awards: 20 golds, 27 silvers and 14 bronzes. This is the highest medal count in the history of the competition.

AtomSkills Industry-Wide Competition. The AtomSkills Competition is the world's largest corporate professional skills competition held in accordance with WorldSkills standards. In the reporting year, more than 1,400 people from 40 regions of Russia took part in the event and competed in 39 professional competences. 16 teams from the Engineering, Power Engineering, Mechanical Engineering, Fuel and other Divisions of the Company took part in the competition. Traditionally, the competition featured about 200 students from nine universities led by the core university in the nuclear industry, NRNU MEPhI, as well as specialists from a number of large industrial companies. A junior programme was held for the first time; it was prepared by the Junior Council of the Corporation and ambassadors of the ROSATOM's Juniors movement.

DigitalSkills. In September, the team of the nuclear industry and NRNU MEPhI competed in 11 out of 29 competences represented in the 4th Industry-Wide Professional Skills Competition in the Field of Information Technology DigitalSkills 2022 and won 10 awards.

Optimisation and Productivity Competition. The 2nd Optimisation and Productivity Competition forming part of the Labour Productivity National Project featured more than 400 contestants and experts across eight competition areas. 53 representatives of six divisions in the nuclear industry took part in the competition. The team won the main prize of the Competition, the Trophy for the Highest Overall Score, having scored the highest number of points in the 'Engineering Thinking. Karakuri' competence.

World Construction Championship. ROSATOM's team including representatives of JSC Atomenergoprom took part in the 2nd World Construction Championship. The team comprised 165 people and won prizes in 16 out of 20 categories. The team of the nuclear industry won 26 medals: four bronzes, 13 silvers and nine golds, including in one of the biggest and most prestigious categories, The Best Construction Site, where the Corporation ranked first and second.

Participation in competitions held in accordance with the WorldSkills methodology and awards won in 2022

Competitions	Competences represented	Total medal count	Gold	Silver	Bronze
High-Tech 2022	25	61	20	27	14
2 nd Optimisation and Productivity Competition	4	7	3	2	2
DigitalSkills 2022	11	10	4	1	5
2 nd World Construction Championship	20	26	9	13	4
Total		104	36	43	25

ROSATOM's Person of the Year

The number of applications submitted by employees in the nuclear industry for the 9th ROSATOM's Person of the Year Industry-Wide Recognition Programme reached a new record high (2,855 applications, up by 8% year on year). This is an all-time record in the history of the programme, with a total of 16,155 applications submitted over nine years.

The competition featured workers, engineers, researchers and employees of corporate functions. A record number of finalists were chosen: 454 employees won awards in 63 team and individual categories. In addition, a special prize was awarded by the Chairman of the Supervisory Board to mark the Year of Science and Technology in Russia.

Corporate volunteering

ROSATOM's approaches and principles of volunteering

In 2018, ROSATOM made an official decision to launch a corporate volunteering programme. The Company, jointly with volunteers from its key Divisions, has identified the following five main areas of volunteer activity:

- ment):

- games, competitions);

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

has exceeded 500,000 people.

Prioritised areas of volunteer activity

The Company's volunteers are actively involved both in the implementation of traditional industry-wide projects (in areas such as blood donations, career guidance and mentoring, environmental volunteering, support for veterans, the elderly, socially disadvantaged groups and animals) and in the promotion of new practices, such as the development of local communities, support for creative industries, social adaptation and provision of training for people with disabilities.

In 2022, the Company joined a large-scale industry-wide project to help stray animals, the Fluffy Atom. In the reporting year. 37 enterprises in the industry joined the project. Together they supported 22 animal shelters across Russia.

Ahead of the New Year, the Company's volunteers and participants of the #WeAreTogether International Forum of Civil Participation sent more than 1,500 New Year greetings cards to elderly people supported by the Joy of Old Age Foundation. The cards were illustrated with drawings made by children of employees in the industry that had been submitted to the Energy of Kindness children's drawing contest.

Employees of the Company's enterprises regularly participate in blood donation campaigns; this includes undergoing blood typing in order to join the bone marrow register. Blood donation campaigns are held regularly, with the number of donors increasing year by year. For instance, in 2022, employees donated their blood more than 3.200 times as part of the Industry-Wide Donor Months (in April and October). An industry-wide donor register was compiled in order to promptly replenish blood banks.

With active support from JSC Atomenergoprom's volunteers, work was initiated to create an integrated information resource on bone marrow donation, cancer prevention and grant writing.

As part of environmental volunteering, more than 200 environmental campaigns were conducted; more than 20 tonnes of municipal solid waste were collected, and 11,000 trees were planted.

Environmental conservation (awareness campaigns, clean-ups, planting of seedlings, waste manage-

Supporting socially disadvantaged groups (low-income families, orphans, the elderly) and veterans;

Promoting a healthy lifestyle (blood donations, sporting events);

- Career guidance and mentoring (lessons in schools, guided tours for the general public, intellectual

Intellectual volunteering (leveraging employees' professional skills in the regions of operation).

In 2022, the Company conducted about 400 volunteer campaigns, including 12 industry-wide ones, with the total number of volunteers in the industry exceeding 40,000 people. The total number of beneficiaries Intellectual volunteering included developing dozens of innovative solutions using digital technologies for urban infrastructure development (digital twins of towns and cities, systems for the optimisation of public transportation, BIM projects, digital products for tourists); more than 1,000 awareness-raising events were held to promote science, blue-collar and engineering jobs and the environmental culture.

Volunteer training

To improve the quality of social projects and expand the range of formats of volunteer activity, more than 150 hours of educational content were created for volunteers and leaders of the volunteer community; a CSR University was launched to study the basics of community engagement and various approaches to CSR, such as programmes and grant writing. In addition, the CSR Accelerator project was implemented. As part of the project, participants from across Russia developed and scaled their projects, with the best practices presented to the Director General of ROSATOM.

In 2022, volunteering practices expanded beyond the industry and nuclear towns and cities. More than 15 companies became partners of projects run by the ROSATOM's Volunteers movement. A number of cross-corporate meetings, joint campaigns and business events were held in 2022, enabling representatives of various companies to meet in person and share their experience.

Representatives of universities are also actively involved in volunteer campaigns (for instance, every year, more than 300 students of NRNU MEPhI take part in environmental field trips).

Particular attention should be given to a project titled 'Social Leader of Usolye-Sibirskoye'; this is a grant competition enabling the town's volunteers to submit their project idea and join the project teams of other applicants (non-profit organisations, educational institutions or entrepreneurs) and subsequently take part in the implementation of the winning projects. Following the 2021/2022 competition, 18 winning projects were successfully implemented, with the total number of beneficiaries exceeding 7,500 people.

An important focus area in 2022 was the development of volunteer communities within the industry and in towns and cities, and integration with federal projects. The Company's volunteers took part in the Clean Arctic and Garden of Memory campaigns and joined nationwide campaigns such as BumBatl (which involved collecting 25 tonnes of waste paper) and the Volga Day.

Volunteer activity in the Company and across the industry has been appreciated by experts and recognised at the federal level. In 2022, the Volunteering and CSR Programme of the nuclear industry received key federal awards: WeAreTogether, Champions of Good Deeds, the Crystal Pyramid in the CSR Project of the Year category, Investment Leaders, People Investor, the National Environmental Award presented by the *Komsomolskaya Pravda* newspaper, etc.

GRI 3-3 Social policy

The Company's social policy is designed to:

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

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

GRI 403-6 Key corporate social programmes of JSC Atomenergoprom, RUB million



Voluntary health insurance

Accident and illness insurance

Health resort treatment and recreat and their children, including:

 health resort and rehabilitation employees

health resort treatment and red

Provision of housing for employees

Private pension plans

Support for retirees

Catering arrangements

Sporting and cultural events

Assistance to employees

Other

Total

The Company is actively developing a corporate social programme focused on employee well-being, which was launched in the industry in 2020; its main goal is to improve the quality of employees' life. The programme includes measures to promote employees' physical, emotional, social, professional and financial well-being: health days (including those focused on healthy eating and lifestyle improvement), consultations and webinars conducted by medical specialists, webinars on financial literacy, a mental health support line, as well as opportunities to participate in charity work and other social initiatives.

JSC Atomenergoprom attaches great importance to encouraging its employees, their family members and residents of the Company's regions of operation to regularly exercise and do sports. One in every six employees regularly does sports.

The biggest sporting event over the past four years has been the Running Race of Nuclear Towns and Cities: the number of its participants increased from 7,000 people in 2019 to 20,000 people in 2022, with the geographical scope of the event and the number of categories of participants continuously expanding. In 2022, employees, their family members, students and residents of the Company's host towns and cities, including in the Republic of Belarus and Turkey, took part in the event offline. In addition, more than 3,000 employees and their family members from 80 Russian cities and towns joined the event online.

	2020	2021	2022
	1,586.0	1,855.4	2,241.9
	54.7	77.4	88.2
tion for employees	416.8	729.6	1,042.8
n treatment for	357.8	546.5	818.8
creation for children	59.0	183.1	224.0
	614.3	532.6	582.0
	357.6	397.8	588.6
	893.4	874.9	1,244.4
	355.2	412.0	1,073.4
	1,034.4	1,042.9	1,272.0
	936.5	1,089.2	1,507.9
	-	-	278.4
	6,249.0	7,011.8	9,919.6

GRI 2-30

l

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

JSC Atomenergoprom adheres to an Industry-Wide Agreement on Nuclear Power, Industry and Science for 2018–2020 (the Agreement), which has been renewed until the end of 2022. The Agreement is based on the established practice of social partnership in the nuclear industry and is aimed at implementing the Integrated Standardised Remuneration System, the Uniform Industry-Wide Social Policy and the Occupational Health and Safety Management System.

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

Recruiting young professionals

In order to encourage promising young professionals to work in the industry and to generate interest in STEM disciplines and engineering professions among school and university students, JSC Atomenergoprom as a company of ROSATOM actively participated in federal events and projects: a nationwide student competition, Your Move; the Big Break Nationwide Competition for Schoolchildren; an academic competition, I'm a Professional; the Career Time nationwide campaign, including the Golden Internship competition; joint events held in cooperation with the Sirius Educational Centre (the Talent and Success Foundation) and the Russian Znanie Society. The annual reach of the federal projects exceeds 10 million views.

The programme to promote student construction teams in the nuclear industry continues. In 2022, 2,144 students took part in the winter and summer work terms. During the work terms, a career guidance programme was run; as a result, 51 people were hired by nuclear enterprises.

The Company continued to organise work placements for students from specialised educational institutions: more than 2,400 students completed internships in the Company's organisations in 2022.

In 2022, JSC Atomenergoprom's organisations hired 72 university graduates who had studied under arrangements with the Company's organisations.

Overall, the Company's organisations hired 1,234 university graduates in 2022.

International cooperation in education

JSC Atomenergoprom is actively promoting Russian engineering education abroad to popularise it and strengthen the Company's positions on the global nuclear technology market. The Company is creating educational infrastructure required for personnel training in partner countries and is developing national nuclear education systems using Russian educational technology.

Foreign students study nuclear and related disciplines at Russian universities. Foreign students attend NRNU MEPhI, as well as core universities of the Company and partner universities: Tomsk Polytechnic University, St. Petersburg University, St. Petersburg Polytechnic University, Mendeleev University of Chemical Technology of Russia, National Research University Moscow Power Engineering Institute, Far Eastern Federal University, Ural Federal University, Moscow Institute of Physics and Technology, National Research University Moscow State University of Civil Engineering, Bauman Moscow State Technical University, Alekseev Nizhny Novgorod State Technical University, and National University of Science and Technology MISiS. In 2022, more than 2,000 foreign students from 65 countries studied at Russian universities.

JSC Atomenergoprom's core universities continue to successfully implement international educational programmes in cooperation with foreign universities in the Company's partner countries: Egypt, Bolivia, Brazil, Ghana, Armenia, Kazakhstan, Bangladesh and Rwanda (with a total of 15 programmes run by NRNU MEPhl. Tomsk Polytechnic University, St. Petersburg University, Lomonosov Moscow State University and Alekseev Nizhny Novgorod State Technical University).

The Company continues to develop overseas branches of core universities of the nuclear industry. In the 2022/2023 academic year, 310 people were studying at the Tashkent Branch of NRNU MEPhI as part of four educational programmes. At the end of this academic year, the first cohort of students will graduate from the university.

On 12 September 2022, a branch of NRNU MEPhI was opened in Almaty (Republic of Kazakhstan); two educational programmes were launched on 1 October 2022. Currently, 94 students are studying at the branch.

Foreign students show considerable interest in hackathons held with support from the Company, or HackAtoms. These are competitions of student teams on nuclear topics. In 2022, HackAtoms were held in Kazakhstan, Argentina, Bulgaria, Hungary, Armenia and Bolivia.



UNIVERSITY GRADUATES HIRED BY THE COMPANY'S ORGANISATIONS

Human rights

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

ROSATOM's Human Rights Policy came into force in June 2022; it applies to the Company and its organisations. The Policy states that people are a top priority for the nuclear industry; accordingly, primary importance is attached to ensuring their safety, supporting them and respecting their rights. The industrywide policy sets out seven key principles underpinning the Company's approach to people:

safety at all management levels;

 Occupational safety and health: priority is given to providing a workplace environment that poses no risks to employees' lives or health and to promoting a responsible approach to occupational health and
- Prevention of forced and child labour: preventing situations when people are forced to work using violence and intimidation; avoiding the use of child labour and eliminating it completely throughout the world:
- Prevention of harassment and abuse: aggressive behaviour, threats and insults in any form (physical, verbal, psychological or sexual) are not allowed either in or outside the workplace; the Company protects people's dignity and equality;
- Prevention of any discrimination: the Industry-Wide Agreement on Nuclear Power, Industry and Science and the Company's internal regulations contain no provisions barring people from being employed in the industry on the grounds of gender, ethnicity, background, the level of personal wealth, marital or social status, position, age, place of residence, attitude towards religion, political opinions or membership of public associations; any personnel management decisions, from hiring to retirement, are based on the principle of equal opportunities;
- Equal access to opportunities and fair remuneration: all employees receive competitive salaries and have equal access to opportunities: social security, training enabling both professional and personal development:
- Freedom of association and the right to collective bargaining: the Company supports freedom of association, recognises employees' inalienable right to collective bargaining and the right of each employee to collective representation of their interests, and respects employees' right to membership in organisations aimed at safeguarding and promoting their interests;
- Development of the regions of operation and local communities: the Company has adopted a responsible approach to respecting the rights and promoting the well-being of local communities in its regions of operation; it cooperates with government bodies and treats local residents in its regions of operation with respect

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

The Company's top priorities in the sphere of employment rights and human rights are to provide a workplace environment that poses no risks to employees' lives or health and to promote a responsible approach to occupational health and safety at all management levels.

JSC Atomenergoprom and its organisations support freedom of association, recognise employees' inalienable right to collective bargaining and the right of each employee to collective representation of their interests, and respect employees' right to membership in organisations aimed at safeguarding and promoting their interests.

The Company and its organisations have adopted a responsible approach to respecting the rights and promoting the well-being of local communities in their regions of operation, cooperate with government bodies and treat local residents in their regions of operation with respect.

GRI 2-26 Employees are informed about an industry-wide hotline which can be used for submitting reports, including complaints and enguiries from individuals and organisations, as well as guestions concerning ethical conduct, to safeguard their right to apply in person and to submit individual and group enquiries to protect the rights and legitimate interests of the company, its organisations and their employees.

GRI 2-26 Code of Ethics⁶¹

corporate image.

Sustainable Development⁶².

Plans for 2023 and for the medium term:

- To create an environment for continuous development;
- To shape an open culture and encourage employee involvement;
- To update the Code of Ethics and improve the performance of the Ethics Board;
- To develop a safety culture aligned with the Vision Zero paradigm (for details, see the section 'Occupational Safety and Health');
- To improve the guality of employees' life and promote a healthy lifestyle;
- To improve the handling of reports and enguiries;
- To continue to top the rankings of the best employers;
- programmes.

GRI 2-23 ROSATOM and JSC Atomenergoprom have adopted a uniform Code of Ethics and Professional Conduct for Employees. The Code of Ethics communicates the key values of the nuclear industry and defines the relevant ethical principles of employee conduct when interacting with a wide range of external and internal stakeholders. The rules of conduct set out in the Code concern combating corruption, protecting the Company's resources, property and information, occupational health and safety, industrial and environmental safety, conflict prevention and resolving conflicts of interest, as well as maintaining the

For more information on the application of the precautionary principle, see the Unified Industry Policy on

To develop an online training system and increase the number of employees covered by training

8.2. DEVELOPING THE REGIONS WHERE NUCLEAR FACILITIES ARE LOCATED

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

Tax payments by JSC Atomenergoprom to budgets of different levels in the Russian Federation, RUB billion

Level of the budget system	For 2020	For 2021	For 2022	Deviation, %
Federal	114.3	132.3	166.0	25.5
Regional	94.8	72.3	72.1	-0.3
Local	0.2	0.3	0.4	33.3
TOTAL	209.3	204.9	238.5	16.4

Ensuring the energy security of Russian regions

In 2022, nuclear power generation accounted for 19.9% of the total electricity output in the Unified Power System of Russia (like in 2021). If this amount of electricity was generated by conventional power generation equipment, it would produce significant greenhouse gas emissions. In fact, in 2022, the Company's operations helped to prevent greenhouse gas emissions in Russia totalling 109.5 million tonnes of CO_2 equivalent.

Generating employment through NPP construction

Employment in key NPP construction projects as at 31 December 2022

Region	Actual headcount, including contractor organisations, persons (2022)	Including employees recruited from local communities, persons* (2022)	Number of local building contractors engaged in construction between 2020 and 2022
Russia (Kursk NPP-2**)	9,439	8,426	31
Foreign NPPs (Belarusian NPP, Rooppur, El Dabaa, Paks)	31,432	23,154	34
TOTAL	40,871	31,580	65

* Employees who are nationals of the countries where the NPPs are being built.

**The figure for Kursk NPP-2 represents the number of employees who are Russian nationals.

GRI 3-3 Contribution to the implementation of national projects

The Company's key priority in terms of engagement with its regions of operation is to increase the effectiveness of participation of its host towns and cities in the implementation of national projects. Thus, in 2022, the total volume of funding for national projects in nuclear towns and cities increased by 37% compared to 2021 and reached RUB 7,856.31 million, including capital investments totalling RUB 4,669.49 million.

In 2022, JSC Atomenergoprom's organisations within ROSATOM continued to support the participation of nuclear towns and cities in the implementation of national and federal projects. The Company continues to provide methodological support to the towns and cities in order to increase the efficiency of their participation in the implementation of national projects. In 2022, a practical workshop involving experts of the Institute for Urban Economics Foundation was held in order to inform municipal administrations about ongoing changes at the federal level which are relevant to the national projects. As part of the workshop, an updated methodology for the participation of towns and cities in the implementation of national/federal projects was presented, and illustrations were provided of changes in the regulatory framework which had been implemented or were scheduled for implementation and which affected the municipalities. The largest number of towns and cities take part in the implementation of the Housing and Urban Environment, Education, Culture, and Ecology National Projects.

In 2022, all of the Company's h ronment National Project.

The federal project titled 'Creating a Comfortable Urban Environment', which forms part of the Housing and Urban Environment National Project, is being implemented in all of the Company's host towns and cities, except for Bilibino. The cost of measures implemented over four years totals RUB 6,031.6 million, including RUB 1,554.1 million in 2022.

The Clean Water Federal Project was included in the Housing and Urban Environment National Project in 2021. In 2022, as part of the project, an initiative was launched in the CATF of Seversk to improve the water supply and sewerage system.

The majority of the towns and cities take part in the Culture National Project. As part of the project, culture development centres, modular municipal libraries and virtual concert halls have been established; children's art schools have been provided with musical instruments; grants are awarded every year to support creative teams.

Urban environment

Between 2018 and 2022, nuclear towns and cities received methodological assistance in shaping and developing the urban environment. Lectures and expert discussions were held; master plans were developed for six projects in five towns and cities; applications were prepared for participation in the National Competition of the Best Projects to Create a Comfortable Urban Environment (hereinafter referred to as the Competition), which is held by the Russian Ministry of Construction, Housing and Utilities. Systematic methodological work with municipal administrations and the participation of nuclear towns and cities in the Competition have made it possible to develop a comprehensive vision of projects focused on urban improvement and the development of the urban environment and the towns' and cities' long-term plans to develop the urban environment, which successfully combine solutions for urban improvement and business development.

In 2022, seven of JSC Atomenergoprom's host towns and cities won the 6th National Competition for Best Projects to Create a Comfortable Urban Environment, which totals 5% of the nationwide figures, 15% in the Towns with Population of 50,000 to 100,000 People category and 5% in the Towns with Population of 20,000 to 50,000 People category.

In 2022, all of the Company's host towns and cities continued to implement the Housing and Urban Envi-

l

Mechanisms for the funding of projects aimed at developing a comfortable urban environment, modern infrastructure and services include the concession mechanism. As part of efforts to develop services improving the standard of living in towns and cities, an initiative has been launched to develop projects focused on creating modern social infrastructure in the nuclear towns and cities using the concession mechanism. The relevant working groups have determined the focus areas for pilot projects (schools, housing and utilities, cultural facilities, digital economy, senior centres, management of municipal solid waste and medical waste).

Urban environment guality ratings assigned to nuclear towns and cities

14 of the Company's host towns and cities have been assigned an urban environment guality rating indicating a favourable urban environment. Furthermore, the average rating assigned to JSC Atomenergoprom's host towns and cities stands at 198, which indicates a favourable urban environment (a score of up to 180 points indicates an unfavourable urban environment, while a score of 181 points and more indicates a favourable urban environment).

Healthcare development in nuclear towns and cities

In 2022, a project was launched jointly with the Federal Medical and Biological Agency of Russia to upgrade primary healthcare in the Company's host towns and cities; the aim of the project is to implement a modern organisational model for municipal, onsite and children's clinics which is based on the principles of accessibility, openness and the use of state-of-the-art technologies.

Healthcare institutions in pilot areas met the 'basic' criteria set as part of a federal project titled 'New Model of a Healthcare Institution', which produced the following transformation effects: the amount of time required for employees to undergo medical examinations was halved: the waiting time for scheduled hospital admission was reduced three-fold; the waiting time for receiving information was reduced fivefold; in addition, new operating standards were implemented for reception areas in organisations of the Federal Medical and Biological Agency of Russia.

Major repairs were carried out in municipal, children's and onsite clinics with a total floor area of 5,789 square metres. The required medical furniture, equipment and specialised vehicles were purchased.

As part of the project, training and retraining programmes for medical personnel were developed and approved.

GRI 203-2 Contribution to the economy

Implementation of agreements with constituent entities of the Russian Federation in 2022

Organisations managed by JSC Atomenergoprom participate in the implementation of agreements between ROSATOM and constituent entities of the Russian Federation in which they operate. In 2022, as part of the implementation of the agreements, ROSATOM signed protocols with the governments of the Voronezh, Murmansk, Rostov, Sverdlovsk, Smolensk, Kursk and Tver Regions approving social and economic development programmes for nuclear towns and cities worth a total of RUB 3,306.3 million; the programmes had been developed by the municipalities in consultation with the organisations. During the implementation of the agreements in three of the Company's host towns (Kurchatov, Desnogorsk and Polyarnye Zori), the programmes were revised.

Sixth Forum of Towns and Cities with High Science and Technology Potential. In 2022, the Sixth Forum of Towns and Cities with High Science and Technology Potential organised by ROSATOM was structured as a series of expert discussions that were distributed over time (during the first six months) and held in various Russian cities (Moscow, Cherepovets, Obninsk and Sevastopol).

Social development

ROSATOM's School project. As part of the project, in 2022, systematic work was organised to design effective education models for preschoolers and schoolchildren using a mobile application titled 'Russia Begins Here' that had been developed earlier. As part of the campaign, in 2022, 10 AR objects were created based on designs produced by children.

In 2022, a pilot project titled 'Together across Our Russia' was implemented. As part of a focus area titled 'Design of Digital Didactics to Make Education More Efficient', more than 50 remote events were held for students of the Atom Class Network of ROSATOM's School, with more than 5,000 schoolchildren participating in the events. A total of over 25,000 children and over 400 educational institutions from all towns and cities participating in the project took part in the events.

ROSATOM's Territory of Culture programme. Launched 15 years ago, the programme titled 'ROSATOM's Territory of Culture' includes projects involving famous artists and ensembles, workshops held by leading experts, educational and awareness campaigns, large-scale social and cultural projects, some of which have expanded beyond nuclear towns and cities and have become a major nationwide phenomenon. The programme also involves providing methodological assistance to theatres, museums, libraries and other cultural institutions in nuclear towns and cities, implementing innovative managerial and strategic decisions, holding professional development events for specialists in the relevant areas of expertise to enable gradual modernisation in the sphere of culture 'from the inside'.

In 2022, as part of the programme, a total of more than 100 events of various scale were held across various areas, styles and genres. An official celebration of the 15th anniversary of ROSATOM's Territory of Culture was held in the form of a gala concert at the Et Cetera Theatre in Moscow. The key project in the sphere of musical education in 2022 was the 5th Music Academy of Nuclear Towns and Cities under the auspices of Yuri Bashmet in Obninsk. 2022 saw the launch of a collaboration between ROSATOM's Territory of Culture and the State Museum and Exhibition Centre ROSIZO, which resulted in a major exhibition project run in a number of nuclear towns and cities.

#ROSATOMVMESTE ('ROSATOM Together') competition. In 2022, the competition programme included three focus areas: the competition of social projects, the Urban Project competition and the Day of Nuclear Towns and Cities. The project competition featured 49 video interviews with social project coordinators, which garnered a total of 78,500 views. 18 towns and cities participated in the Urban Project competition. About 490,000 people voted for the best urban project. The Day of Nuclear Towns and Cities was held online in 2022.

'Glory to Creators!' National Creativity Competition. This is a communication project involving both senior citizens and young people. Its goal is to preserve the memory of the residents of the Company's host towns and cities who have contributed to the establishment and development of the nuclear industry and nuclear towns and cities. Since 2021, the competition has been held online on the VKontakte social media platform. In 2022, more than 1,400 schoolchildren took part in the competition. Every year, the Parades of Creators are held in nuclear towns and cities, featuring the heroes and authors of creative works. Since the launch of the competition, more than 14,500 interviews and video stories have been filmed (the total reach of the competition has exceeded 63,000 people); 23,500 essays have been written, and more than 3,000 online applications have been submitted.

Best Municipal Practices competition The competition was launched in 2017 and is held every year in the Company's host towns and cities. Since the launch of the competition, a total of 508 practices and initiatives focused on social and economic development have been submitted; over 23 training events have been held for leaders of municipal practices, and 34 practices have been declared winners and received financial support.

Citizen of ROSATOM's Country project. The key objective of the project is to enable effective communication between governments and the public to promote urban development. Information is posted on the official portal of the project and is made available via the Grazhdanin Strany ROSATOM ('Citizen of ROSATOM's Country': GSR) mobile application, which serve as permanent discussion platforms for the community of proactive citizens. The project has been run since 2016. The application was launched in 2019. Between 2020 and 2022, about 160 online guizzes were held using the GSR application, with more than 25,000 participants. The media platforms of the project contain both news items and background information on current events in the towns and cities.

School for Leaders training programme. The programme is targeted at representatives of the nuclear industry, senior municipal officials and representatives of local governments. Its aim is to improve core management competences. The training programme was launched in 2020. In 2022, educational materials were developed which are designed to support the development of professional skills and new competences and improve the performance of representatives of the nuclear industry and local governments.

Atomic Quiz project. In 2022, about 8,000 people registered on the project website, including about 3,500 residents of nuclear towns and cities. Residents of Volgodonsk, Glazov and Balakovo showed the greatest interest in the project. More than 4.300 people successfully completed the guiz and were awarded a diploma.

School: Third Age – the Whole World Ahead. The project titled 'School: Third Age – the Whole World Ahead' is aimed at encouraging senior citizens to be socially active in order to implement social projects, find opportunities to acquire new knowledge and skills and generate new employment ideas, and develop creative abilities. More than 700 people took part in the project. In 2022, 173 online and offline meetings were arranged and held for them, and two handbooks titled 'Handicraft Therapy' and Windowsill Gardening for Beginners' were developed.

Atomic Workout project. The project is designed to promote a healthy lifestyle by offering local residents an accessible way to exercise and do sports in the courtyards, parks and sports grounds near their homes. The tournament programme includes power workout competitions, prize contests with spectators, workshops and a show programme by the Russian Street Workout Federation. In 2022, more than 5,500 people took part in more than 50 competitions held in eight towns and cities. In 2022, the project finals were held in Glazov.

Plans for 2023

Since the institution of the consolidated taxpayer group (CTG) is to be abolished as from 1 January 2023, the Company is participating in preparations for the signing of new cooperation agreements between ROSATOM and constituent entities of the Russian Federation, which provide for the participation of the constituent entities of the Russian Federation in the development of ROSATOM's regions of operation (including the Company's host towns and cities) and support for the implementation of investment programmes and projects as part of ROSATOM's strategy, as well as the implementation of measures aimed at achieving the national development goals of the Russian Federation.

8.3. STAKEHOLDER ENGAGEMENT

Kev results in 2022:

- 77% of the population in Russia support the use of nuclear energy.
- totals 3.1 million people.

GRI 2-29 Approaches to stakeholder engagement

Due to the scale and special characteristics of its business, JSC Atomenergoprom has a wide range of stakeholders in Russia and globally.

Targeted stakeholder engagement is aimed at achieving strategic goals and gaining public acceptance for nuclear power development.

The Company promotes systematic and constructive stakeholder engagement across all areas of its business and conducts communication and information campaigns for the general public.



- Viewership of channels broadcasting the Strana ROSATOM TV programme in various regions of Russia

- The Company's representatives took part in more than 12 Russian exhibitions and 59 overseas exhibitions and conferences as part of ROSATOM's delegations.

> Fundamental principles underlying stakeholder engagement are as follows:

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

Stakeholder map



Opinion polls

ROSATOM and JSC Atomenergoprom analyse the public perception of the development of nuclear power in Russia on an annual basis and adjust their communication with stakeholders accordingly.

In 2022, JSC Atomenergoprom's reputation score (an indicator whose calculation takes into account the results of opinion polls) stood at 3.7 (2021: 3.5).

According to an independent opinion poll carried out by ZIRCON Research Group in December 2022, 77% of the Russian population supported the use of nuclear power (66% in 2021, 53% in 2020). Over the past few years, the figure has remained consistently high.

On the whole, do you approve or disapprove of the use of nuclear (atomic) energy as a way to provide power supply for the country? (% of the total sample)

2022	77
2021	66%
2020	53%

Nuclear Energy Information Centres⁶³

The objective of Nuclear Energy Information Centres (NEICs) is to raise awareness among local communities about the operation of the nuclear industry and prospects for the development of nuclear power and radiation technologies, make professions in the industry more prestigious, promote science, innovative technologies and technical education, and cooperate with the professional scientific community in promoting science. The NEIC network comprises 20 centres in Russia, including the Atomarium in Sochi, as well as centres in the Republic of Belarus (Minsk). In February 2023, a Nuclear Technology Information Centre was opened in Myanmar; this is a joint project of ROSATOM and the Ministry of Science and Technology of Myanmar.

In 2022, almost 300,000 people participated in NEIC OPEN programmes and the Atomic Workshop series of activities, attended lectures, workshops, intellectual games and science festivals. 480 teams competed in the BrainShaker intellectual tournament launched in 2022: more than 2.000 people gathered at NEIC venues every month in order to answer guiz guestions and questions from experts. More than 37,000 spectators took part in 670 NEIC OPEN programmes run in 18 regions of Russia. The Energy of Science Federal Project enabled local residents in the regions hosting the NEIC network to engage with federallevel researchers and science communicators.

In 2022, the KSTATI ('By the Way') Science Festival was held in Vladimir. Voronezh. Novosibirsk and Chelyabinsk. The festival in Ekaterinburg became the largest event (5,600 participants). In December 2022. the Atom+ festival of teaching practices was held for the first time in five regions.

Industry media

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

- broadcasting the programme totals 3.1 million people).

63. For more information, see the website of the NEIC network at: http://www.myatom.ru



The Icebreaker of Discovery is an educational expedition to the North Pole organised by ROSATOM and the Autonomous Non-Profit Organisation Bolshava Peremena. In 2022, 70 high school students who had won the Big Break Competition took part in the voyage to the Arctic on the 50 Let Pobedy nuclear icebreaker. The participants of the expedition were accompanied by ROSATOM's leading experts in the field of nuclear physics, new technologies, entrepreneurship, design and construction. The project supervisor, ROSATOM's Corporate Academy, prepared an educational programme for the participants of the expedition; the programme consisted of three tracks: Discovering Technology, Discovering the Arctic, and Discovering Oneself. The experts helped the young travellers to master useful skills, held workshops and training sessions.

- A newspaper (published weekly in all organisations in the Russian nuclear industry, with a circulation of 55,000 copies and a readership (including the online version) exceeding 300,000 people);

- A TV news programme (aired weekly in 24 nuclear towns and cities; the viewership of the channels

SAFE OPERATIONS

RUB17.39 BILLION EXPENDITURE **ON ENVIRONMENTAL** PROTECTION

SAFE OPERATIONS 9

9.1. NUCLEAR AND RADIATION SAFETY; **OCCUPATIONAL SAFETY AND HEALTH**

Kev results in 2022:

- There were no events rated at level 1 or higher on the INES scale.
- The injury frequency rate and the lost time injury frequency rate (LTIFR) stood at 0.25 and 0.11 respectively.
- Individual radiation risk was calculated for 65,729 people using the IRAW system.
 - GRI 3-3 The Company's main objective in the area of nuclear and radiation safety is to ensure ongoing accidentfree operation of existing nuclear facilities and other facilities posing nuclear and radiation hazards, safely manage radioactive waste, improve the culture of safe operation of nuclear facilities, and implement modern safety management systems.

Measures aimed at ensuring nuclear and radiation safety are a priority for the Company and its key stakeholders. All of the Company's organisations are directly involved in ensuring nuclear and radiation safety. Key organisations include JSC Atomredmetzoloto, JSC Atomenergomash, JSC Rosenergoatom, JSC TVEL and JSC Science and Innovations.

the for

Licensing of operations in the nuclear power industry, as well as supervision of day-to-day operations of design, construction and operating organisations is the responsibility of an independent government body, namely the Federal Environmental, Industrial and Nuclear Supervision Service of Russia (Rostekhnadzor).

Nuclear and radiation safety management functions in the nuclear industry are performed by the following divisions of ROSATOM:

- The General Inspectorate participates in the preparation of proposals for shaping the government policy on nuclear and radiation safety, implements measures to ensure the safety of nuclear facilities and monitors safety in the Company's organisations;
- The Nuclear and Radiation Safety, Licensing and Permitting Department ensures that personnel and equipment are ready to respond to emergencies at nuclear facilities and monitors the implementation of emergency prevention measures;

- addressing 'nuclear legacy' issues;
- of nuclear energy.

Nuclear and radiation safety at nuclear facilities

In 2022, JSC Atomenergoprom ensured safe and reliable operation of nuclear organisations. There were no incidents involving radiation leaks. Limits on employee radiation exposure were not exceeded. No licences were revoked in the nuclear industry.

Although there was no significant deterioration in the epidemiological situation or the risk of spread of COVID-19 in 2022, some of the targeted inspections organised by the General Inspectorate and other divisions of the Corporation in early 2022 were carried out remotely.

Nuclear power plants

power plants since 2018⁶⁴.

In 2022, there were 37 deviations rated at level 0 and out of scale. JSC Rosenergoatom investigated all deviations in accordance with the prescribed procedure. Their causes were identified: most of the deviations were caused by failures of thermal and electrical equipment due to manufacturing defects which had not been detected during the installation and adjustment of the equipment. Some of the deviations were caused by errors made by the personnel. The Company rated each event that had occurred in accordance with the INES Scale User's Manual and developed corrective measures to prevent similar failures in the future.

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



Total, including: Level 0 and out of scale Level 1

- The Directorate for Public Policy on Radioactive Waste (RAW), Spent Nuclear Fuel (SNF) and Nuclear Decommissioning plays a leading role in the management of government programmes aimed at

The Technical Regulation Department updates the system of technical specifications for the safe use

The safety status of nuclear facilities is assessed based on the number and scale of recorded deviations in their operation, which are benchmarked against the IAEA International Nuclear and Radiological Event Scale (INES). Events on the scale are rated at seven levels: the upper levels (4–7) are termed 'accidents', while the lower levels are 'incidents' (2–3) and 'anomalies' (1). Events that have no safety significance are classified as below scale, at level 0. Events that have no safety relevance are classified as 'out of scale'.

No events rated at level 1 or higher on the international INES scale have been detected at Russian nuclear

2020	2021	2022
24	34	37
24	34	37
0	0	0

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

GRI 3-3 Physical protection of nuclear facilities

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

In 2022, JSC Atomenergoprom contributed to ROSATOM's efforts aimed at improving the regulatory and methodological framework in the sphere of physical protection and security (including anti-terrorism security) of nuclear facilities.

In 2022, a draft Decree of the Government of the Russian Federation on Amendments to the Rules for the Physical Protection of Nuclear Materials, Nuclear Facilities and Nuclear Material Storage Sites was prepared and approved by the relevant federal executive authorities.

In 2023, the Company plans to submit the draft Decree to the Government of the Russian Federation and to continue to improve its regulatory and methodological framework for physical protection and anti-terrorism security of nuclear facilities.

Due to the remaining threat of the entry and spread of the new coronavirus infection (COVID-19) in 2022, targeted inspections carried out in two of the Company's organisations as part of departmental monitoring did not involve site visits by the Company's employees; instead, they were carried out by security specialists of these organisations.

Proposals were prepared to conduct inspections of physical protection as part of departmental monitoring at 12 nuclear facilities in 2023. The proposals were included in the Consolidated Plan of Inspections for 2023 approved by order of the Corporation.

The Company continued to improve the integrated information system for monitoring the status of the system for physical protection of the Company's facilities posing nuclear and radiation hazards. As part of Russia's import substitution strategy, the Control-SFZ-C cross-platform software was upgraded and incorporated in the said information system, enabling it to be run on various operating systems, such as Astra Linux, Windows and Android. The software is scheduled to be tested in 2023.

163 automated workstations (AWSs) for security analysts and 74 AWSs for facility inspectors have been installed in nuclear organisations. These AWSs form part of the monitoring system and have been installed at 43 industry facilities posing nuclear and radiation hazards and in the workplaces of the Company's specialists. The work will continue in 2023.

Based on the findings of analysis and summary of data provided by the Company's organisations, in 2022:

- In accordance with the approved programmes, the organisations continued to take steps to improve physical protection and security equipment at facilities posing nuclear and radiation hazards. All physical protection and security equipment is fully operational; its maintenance is carried out as scheduled. New equipment (that has been in operation for less than 10 years) accounts for 73% of all physical protection equipment at nuclear facilities (74% in 2020 and 2021);
- Scheduled work was carried out to maintain automated security systems for transportation (ASSTs) installed in control centres and special vehicles (railway cars, special motor vehicles and vessels) and replace equipment that had reached the end of its specified service life.

Measures were organised and implemented in full to ensure the physical protection and anti-terrorism security of facilities (premises) of nuclear organisations.

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

In 2022, as in previous years, there were no violations of access control or internal security regulations at JSC Atomenergoprom's facilities which could have resulted in the theft of nuclear materials, terrorist acts or sabotage at nuclear facilities.

Industry-Wide Radiation Monitoring System

The Industry-Wide Radiation Monitoring System (IRMS) is in operation in the Russian nuclear industry as a functional subsystem of the Integrated State Automated Radiation Monitoring System (ISARMS) in Russia⁶⁵.

- on-site subsoil condition monitoring (OSCM);
- potential radiation hazard categories 1 and 2.

The local radiation monitoring systems in the organisations perform regular radiation monitoring in buffer areas and radiation control areas, including:

- locally produced food products and fodder.

In 2022, radiation levels in the areas where facilities of the Company's organisations are located were within the range of natural background radiation. Real-time data from automated radiation monitoring stations are available on the website at www.russianatom.ru.

Amid the ongoing development of the nuclear industry, the government and society have heightened expectations for the safety of technologies used in the industry. One of the ways to improve safety is to enhance the guality and reliability of environmental monitoring. ROSATOM has adopted the IRMS Development Programme for the period from 2021 through 2030 (hereinafter referred to as the Programme), which defines focus areas for IRMS development and measures for enhancing it. The Programme comprises 58 measures to be implemented across eight focus areas.

65. Pursuant to Articles 20 and 21 of Federal Law No. 170-FZ of 21 November 1995 on the Use of Nuclear Energy, ROSATOM performs state radiation monitoring in the Russian Federation in the locations of nuclear facilities owned by operators with regard to which ROSATOM exercises government control over the use of nuclear enerav.

 The DIAC is the information and data analysis centre within ROSATOM's departmental radiation monitoring subsystem forming part of the ISARMS; it integrates data from local radiation monitoring systems and the industry-wide automated radiation monitoring system (IARMS) and the findings of

30 local radiation monitoring systems are in operation in ROSATOM's organisations included in

Continuous monitoring of the gamma radiation dose rate through the ARMS;

 Periodic monitoring of the gamma radiation dose rate using portable and mobile equipment. dosimeters, radiometers and spectrometers, as well as on-site monitoring of the annual gamma radiation dose in buffer areas and radiation control areas using accumulating dosimeters;

 Periodic monitoring (using portable, mobile and fixed equipment) of radionuclide content in various components of the natural environment: in the lowest layer of the atmosphere, atmospheric precipitation, soil, surface water bodies into which liquid effluents are discharged and hydrologically connected water bodies, bottom sediments, aquatic organisms, groundwater, vegetation, as well as in

The implementation of the Programme will enable ROSATOM to obtain, analyse and report the findings of radiation monitoring and data on radionuclide content in various components of the environment using a modern research and methodological framework, software and hardware in order to take necessary measures to prevent or reduce the radiation impact on local residents and the environment.

GRI 3-3 Emergency preparedness and special transportation

In order to ensure the safe operation of the nuclear industry and protect employees, the local population and regions against the possible impacts of accidents (emergencies), nuclear organisations operate and improve a functional subsystem for emergency prevention and response which covers the organisations (facilities) controlled by JSC Atomenergoprom and falling within the scope of its operations. This subsystem forms part of the integrated state system for emergency prevention and response.

A Programme for the Development of the Emergency Preparedness and Response System until 2035 and beyond was approved in 2022 by order of ROSATOM; it covers the organisations of JSC Atomenergoprom

In the reporting year, the needs of organisations in the industry for special cargo transportation were fully met. All shipments of nuclear materials, radioactive substances and products made from them fully complied with established requirements. Steps are being taken to improve the industry-wide automated system for safe transportation of radioactive substances (ASST-RS). Work was continued to produce and upgrade special vehicles and equip them with modern automated security systems.

GRI 3-3 Occupational safety and health

GRI 403-1

One of the fundamental priorities for JSC Atomenergoprom is to protect the life and health of employees in the industry. Internal regulations adopted in the Company and its organisations (primarily the Uniform Industry-Wide Policy on Occupational Safety and Health) are aimed at preventing workplace accidents and occupational diseases, systematically monitoring working conditions and occupational safety performance,

Since 2019, ROSATOM has been involved in the Vision Zero international campaign and seeks to achieve a zero injury rate in nuclear organisations.

ensuring the safety and protecting the health not only of the Company's employees, but also of employees of contractors and subcontractors involved in the operation of nuclear facilities.

The Company and its organisations recognise their responsibility for the safety of production processes, occupational safety and health, given that the rapid development of the nuclear power industry makes it crucially important to guarantee compliance with fundamental principles whereby priority is given to protecting employees' life and health and enhancing the protection of people and the environment against radiation exposure.

Responsibility for ensuring safety⁶⁶ of the use of nuclear energy for civilian and defence purposes by organisations of JSC Atomenergoprom in the course of their operations has been assigned to the Inspector General of ROSATOM.



ROSATOM's divisions



Key functions of the Corporation's Inspector General include the following:

- the Company on occupational safety and health;

Diagram of safety management (including occupational safety) in the Company through

- Timely and full detection of non-compliance with Russian laws and local regulations of ROSATOM and

 Responsibility for the exercise of powers and performance of functions related to nuclear and radiation safety by the Corporation and the Company as a government regulator controlling the use of nuclear energy, as well as the functions of a regulator in the sphere of industrial and fire safety, the safety of hydraulic structures, occupational safety and health and environmental protection in ROSATOM's organisations (including the Company and its organisations);

162 REPORT ANNUAL MO S Ensuring that the Corporation has in place the relevant methodological framework which is complete and of appropriate quality and is aligned with Russian occupational safety laws.

The performance of the Inspector General is evaluated annually based on indicators specified in the approved KPI map. Key indicators include the reduction in the severity of injuries at facilities of the Corporation's organisations, including contractors (average, against the previous three years as a baseline period).

GRI 403-1 ROSATOM has adopted the Uniform Industry-Wide Policy on Occupational Safety and Health⁶⁷, which GRI 403-3 applies to JSC Atomenergoprom and its organisations and stipulates the goals, key principles and GRI 403-8 obligations in the field of occupational safety and health. Its principles underpin the occupational safety and health management systems used by JSC Atomenergoprom's organisations.

> The Uniform Industry-Wide Policy on Occupational Safety and Health is designed to support the implementation of the main provisions of the Constitution and legislation of the Russian Federation, the norms of international law recognised by the Russian Federation and the provisions of international treaties, the Basic Principles of Government Policy on Nuclear and Radiation Safety in the Russian Federation until 2025 and other fundamental documents supporting the main areas of government policy of the Russian Federation in the field of occupational safety and health and national regulatory requirements for occupational safety and health.

> The policy applies to all of the Company's employees; in addition, the Company requires its contractors and subcontractors to comply with occupational safety and health standards adopted in JSC Atomenergoprom

> The key principles underlying occupational safety initiatives of the Company and its organisations include the followina:

- Giving priority to employees' lives and health over operational performance;
- Continuously improving performance and enhancing employees' safety competences;
- Planning and implementing measures aimed at reducing injury and occupational disease rates;
- Systematically providing employees with state-of-the-art personal protective equipment to protect them against occupational hazards;
- Disclosing material information on occupational safety and health initiatives;
- Setting uniform occupational safety and health requirements aligned with Russian laws and regulations and global expertise;
- Seeking to ensure that all employees of the Company and its organisations are aware that compliance with occupational safety requirements is an integral part of their work.
- GRI 403-8 Regulations on occupational safety are listed in the Uniform Industry-Wide Guidelines for Developing and Improving an Occupational Health and Safety Management System (OHSMS) in ROSATOM's Organisations (Section 11).

100% of the Company's employees (144,451 people) are covered by the OHSMS⁶⁸.

The percentage of employees covered by an OHSMS that has been internally audited as part of internal safety and guality control totals 100%; the percentage of employees covered by an OHSMS that has been internally audited in accordance with the Action Plan to Improve Sustainability Maturity in the Industry for 2022 stands at 67.3%.

In 2022, 42,335 employees (29.3%) worked for the Company's organisations that have a GOST R ISO 45001 or ISO 45001-certified occupational health and safety management system.

GRI 403-2 Managing occupational safety and health risks

The Uniform Industry-Wide Guidelines on Occupational Risk Management in ROSATOM's Organisations have been put into effect as part of the industry-wide occupational safety and health management system. This document is aimed at identifying workplace hazards, assessing occupational risk levels and developing corrective measures to reduce occupational risks.

Occupational risks in the Company's organisations are managed as follows:

- 1. Identifying hazards in the workplace;
- 2. Assessing occupational risk levels in the workplace;
- 3. Developing measures to reduce occupational risk levels.

Occupational risk levels are assessed for each workplace. Occupational risk management commissions are established in the organisations. Members of employees' professional associations (where such associations exist) are involved in the work of the commissions. Members of the commissions are trained in occupational risk management.

The results of hazard identification are formalised in the organisation's Safety Hazard Register. The occupational risk level is assessed by the Company's organisations for each identified hazard in the following order:

- 1. Assessing the level of occupational risk;

An occupational risk assessment card is generated for each workplace.

Based on the occupational risk assessment results, the organisation develops an action plan to improve the effectiveness of existing and implement additional occupational risk management measures. The occupational risk management commission annually reviews the findings of the monitoring of occupational risk assessment and management activities in order to ensure that all measures at the planning and implementation stages have been implemented in full and on time. Based on the results of the annual review, a plan of corrective actions (measures) is formed, which is aimed at improving the effectiveness of occupational risk management.

The Corporation has set up and operates a hotline to receive employees' enguiries and reports concerning working conditions and occupational safety and health.

2. Assessing the acceptability of the occupational risk level (acceptable, tolerable, unacceptable).

^{67.} https://rosatom.ru/upload/iblock/74a/74a0da78404893d842f5cc1136de08c7.pdf

^{68.} Information is provided on JSC Atomenergoprom's organisations which collect the relevant occupational safety data

GRI 2-25 Prevention of occupational injuries

To prevent and minimise occupational injuries, the Company's organisations implement a number of measures on an ongoing basis, the list of which is approved by ROSATOM's Director General:

- 1. List of instructions of ROSATOM's Director General on preventing injuries when working with electrical equipment.
- 2. List of instructions of ROSATOM's Director General on improving process discipline in ROSATOM's organisations during construction, renovation, upgrade and repairs of facilities.
- 3. Order of ROSATOM on Approval of an Action Plan for the Prevention of Occupational Injuries at the Facilities of ROSATOM's Organisations When Working at Heights.
- 4. Order of ROSATOM on Approval of an Industry-Wide Plan of Urgent Measures to Ensure Safety and **Reduce Occupational Injuries.**
- 5. Order of ROSATOM on Approval of a Comprehensive Programme for Preventing Occupational Injuries in the Nuclear Industry.

GRI 403-4 Safety culture and occupational safety and health⁶⁹

In terms of a safety culture, the Company and its organisations focus on shaping and developing those characteristics of their operations and individual employee behaviour that help to maintain an acceptable safety level, protect people and the environment against the negative impacts of their operations, and ensure that employees of the Company and its organisations are committed to safety as the main goal and are guided by fundamental safety principles.

GRI 403-9 In 2022, JSC Atomenergoprom's organisations implemented preventive measures on an ongoing basis to enhance the workplace safety culture.

Occupational injury rates in JSC Atomenergoprom

Indicator	2020	2021	2022
Number of people injured in accidents	15	16	35
Number of fatalities	0	2	6
Injury frequency rate (FR)	0.12	0.17	0.24
LTIFR (per 1,000,000 man-hours)	0.06	0.07	0.11
LTIFR (per 200,000 man-hours)	0.012	0.01	0.02
Number of people newly diagnosed with an occupational disease	10	6	16

Number of man-hours worked ⁷⁰

Number of serious injuries

Number of people newly diagnosed

Fatality rate (per 1 million man-hou

Fatality rate (per 200.000 hours)

Serious injury rate (per 1 million ho

Serious injury rate (per 200,000 ho

Reported occupational injury rate

Reported occupational injury rate

Occupational disease rate (per 1 m

Occupational disease rate (per 200

Number of people injured in accide

Causes of the accidents included:

- Non-compliance with road safety rules;
- Inadequate work organisation;
- Non-compliance with operational procedures;
- Design flaws and poor equipment reliability;
- Negligence on the part of the victims.

Between 2020 and 2022, all fatalities were men.

GRI 403-10 A total of 16 people were newly diagnosed with occupational diseases in 2022, including 16 people in JSC Atomredmetzoloto (PJSC PIMCU).

The occupational disease risk remains high in PJSC PIMCU.

In 2022, the FR stood at 0.25, as against 1.2 across Russia.

69. The principles, approaches, policies and mechanisms for managing the safety culture are described in the 2021 Annual Report of JSC Atomenergoprom, pp. 198-200.

Occupational safety and health performance of JSC Atomenergoprom's organisations in 2022

	245,874,402
	8
d with an occupational disease	16
urs)	0.024
	0.005
purs)	0.033
urs)	0.007
(excluding / including fatalities) (per 1 million hours)	0.12/0.14
(excluding / including fatalities) (per 200,000 hours)	0.024/0.03
illion hours)	0.065
,000 hours)	0.013
ents in contractor organisations ⁷¹	4 ⁷²

GRI 403-9 A total of 35 people were injured in JSC Atomenergoprom in 2022, including 27 men and 8 women. This included eight people who suffered serious injuries and six fatalities.

- The main occupational hazards posing a high risk of occupational diseases include general and local impacts of vibration on the body and noise exposure affecting hearing.

71. No data are available on man-hours worked or newly diagnosed occupational diseases in contractor organisations.

^{70.} Not including information on 113 organisations (an increase in the number of organisations in 2022 was due to a considerable expansion of the scope of the industry compared to 2021).

^{72.} Including two minor accidents and two fatalities.

The risk of injuries remains high for employees who violate safety rules during the operation and maintenance of equipment, and for those employees who do not follow safety precautions when moving around the premises of an organisation.

In addition to the injury frequency rate (FR), JSC Atomenergoprom also uses the lost time injury frequency rate (LTIFR), which enables it to benchmark the injury rate in the Company against that of other companies and countries. The LTIFR has been included in the KPI maps of all Division executives. The LTIFR reference value for the Divisions, units, holding companies and the Company as a whole has been set at 0.5, which is a good result for any company in any country in the world.

Average LTIFR values achieved in Divisions, units and holding companies within the Company over the previous three years have been accepted as baseline (initial, to be improved) values for those Divisions, units and holding companies.

The LTIFR targets are set individually for the Divisions, units and holding companies within the Corporation but do not exceed the baseline values.

LTIFR in JSC Atomenergoprom's Divisions between 2020 and 2022

Division/complex/unit	2020	2021	2022
Mining Division	0	0.22	0.2
Fuel Division	0.02	0.05	0.09
Mechanical Engineering Division	0.07	0.07	0.19
Power Engineering Division	0.03	0.04	0.12
Innovation Management Unit	0.07	0.06	0.06
Total across the Company	0.09	0.08	0.11

Seven people were not included in the LTIFR calculation; three of them were injured in accidents caused by third parties (including road accidents), and four injured persons were included in the LTIFR calculation for 2023 as accident investigations are ongoing.

To reduce the injury rates in its organisations, the Company will implement measures focused on improving production processes, upgrading machine tools, developing a safety culture and enhancing controls.

Radiation exposure of employees

GRI 3-3 Ionising radiation is an occupational hazard specific to JSC Atomenergoprom's enterprises. Radiation safety criteria for personnel are laid down in the Radiation Safety Standards (NRB-99/2009), the Basic Sanitary Rules of Radiation Safety (OSPORB-99/2010) and other regulations. Most enterprises in the industry provide workplace conditions that fully meet the requirements set out in these documents.

Average annual effective radiation dose for employees

As at 31 December 2022, 42,385 people (group A personnel) in the organisations of JSC Atomenergoprom were under individual radiation exposure monitoring. Compared to 2021, the figure increased by 1.3%.

In 2022, the average annual effective radiation dose for JSC Atomenergoprom's employees totalled 1.42 mSv. The average effective and collective radiation doses for personnel remain low and tend to decrease.

The statutory limit on radiation exposure of employees was not exceeded in 2022. There were no persons with a total effective dose of more than 100 mSv over five consecutive years (from 2017 through 2021).

The annual dose limit of 50 mSv was not exceeded.

Average annual effective radiation dose for employees*



In the structure of radiation exposure of employees, the share of employees with doses ranging between 2 mSv and 20 mSv tends to decrease (from \sim 20% in 2020 to 18% in 2022).

Distribution of group A personnel by dose range, %



Individual radiation risks

whose average age exceeds 60 years.



GRI 403-2 In 2022, the Company continued to monitor radiation risks for group A personnel using the IRAW (individual risk assessment workstation) occupational radiation risk assessment system. Individual risk was calculated for 42,385 people. The vast majority of group A employees work in the conditions of acceptable occupational risk. For 596 people (1.4% of the total number of employees included in the IRAW system), individual risk exceeded the standard value of 10⁻³. The high-risk group comprises mainly industry veterans,

	2020*	2021*	2022
Share of employees exposed to negligible and acceptable occupational risk	98.46	98.46	98.59
Share of employees in the high-risk group	1.54	1.56	1.41
Share of employees in the industry undergoing individual radiation exposure monitoring and included in the IRAW system	100.0	100.0	100.0

* Data have been adjusted to account for restructuring in 2022.

In 2022, the average individual radiation risk across the Company stood at 7.3•10⁻⁵. Over the past three years, this indicator has not exceeded 8% of the standard value, and the maximum individual risk has been decreasing steadily.

Fire safety

The fire situation at the Company's facilities is stable. In 2022, there were no fires at the Company's facilities under construction.

In 2022, four fires occurred at facilities operated by organisations within JSC Atomenergoprom's scope of consolidation. No harm to the life or health of personnel was caused, and there were no violations of the limits or conditions of safe operation of the facilities. The cost of damage from fires in the Company's enterprises totalled RUB 46,700 (a two-fold decrease compared to 2021).

List of fires in the Company's enterprises in 2022

Enterprise	Date	Description of the event
PJSC PIMCU (Mining Division)	9 February 2022	A fire broke out in the operator cabin of an overhead crane as a result of a violation of fire safety rules during the operation of electric heaters. There were no injured persons; the cost of damage totalled RUB 46,700.
JSC VNIINM (Fuel Division)	19 April 2022	Electrical equipment in a distribution transformer substation short-circuited and caught fire. There were no injured persons or damage to property.
JSC Atomenergoremont, Beloyarsk NPP branch of JSC Rosenergoatom (Power Engineering Division)	15 August 2022	A fire broke out in a workshop; the fire was caused by faulty electrical wiring posing a fire hazard. There were no injured persons or damage to property.
Rostov NPP branch of JSC Rosenergo- atom (Power Engineering Division)	31 December 2022	Collapse of a generator transformer followed by a release of burning oil. Two NPP employees were injured (one of the employees died; the other one suffered serious injuries); damage to property is being estimated.

Industrial safety

Hazardous industrial facilities operated by JSC Atomenergoprom are required to be registered in the departmental section of the state register of hazardous industrial facilities of ROSATOM in accordance with Decree No. 1371 of the Government of the Russian Federation on Registration of Facilities in the State Register of Hazardous Industrial Facilities dated 24 November 1998.

In 2022, as part of efforts to ensure compliance of the industrial safety management system with new mandatory requirements, JSC Atomenergoprom continued to manage the risk of accidents at hazardous industrial facilities in accordance with the Uniform Industry-Wide Guidelines on the Establishment of an Industrial Safety Management System in ROSATOM's Organisations.

All equipment used at hazardous industrial facilities undergoes timely technical inspection and industrial safety assessment. Compulsory insurance is arranged in accordance with the law on compulsory third-party liability insurance for the owner of a hazardous facility for potential damage from an accident at the hazardous facility. There were no events classified as accidents at hazardous industrial facilities of JSC Atomenergoprom.

Calculations of metrics used to assess the probability of potential negative consequences of non-compliance with industrial safety requirements at hazardous industrial facilities show that the level of risk of accidents is acceptable.

In 2023, the Company plans to continue improving the industrial safety management system, to organise a meeting on industrial safety matters with representatives of JSC Atomenergoprom's organisations (to discuss current matters related to industrial safety), and to hold an annual R&D workshop on industrial safety (to provide training and inform about the latest developments in the sphere of legal regulation). In the course of industrial safety inspections, special focus will be given to compliance with the established procedure for extending the life cycle of technical equipment operated at hazardous industrial facilities that has reached the end of its statutory service life.



9.2. ENVIRONMENTAL SAFETY

GRI 3-3 Environmental safety and environmental protection management. Performance assessment

The environmental footprint of the nuclear power industry is substantially smaller than that of carbonbased power generation using fossil fuels. Nuclear power generation produces virtually no emissions of hazardous chemicals into the atmosphere, including those that destroy the ozone layer or contribute to the greenhouse effect.

JSC Atomenergoprom's organisations attach great importance to environmental safety and 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 operations of organisations in the industry publicly available.

The goals and initiatives of ROSATOM and JSC Atomenergoprom in the field of environmental safety and environmental protection are stipulated in the Uniform Industry-Wide Environmental Policy of the Corporation.

An important tool for the implementation of the environmental policy is a three-year Comprehensive Implementation Plan. In 2022, the Company approved the Comprehensive Plan for the Implementation of the Environmental Policy for the period from 2022 through 2024, which includes organisational, operational and technical measures to be implemented by nuclear organisations.

Inspection visits are carried out as part of the internal safety control system to prevent non-compliance with legislative and regulatory requirements for environmental protection, including inspections of environmental protection at production facilities in the industry; the findings of these inspections provide a basis for the relevant managerial decisions aimed at improving environmental safety performance. Organisations in the industry continue to develop and implement environmental, energy and guality management systems, as well as occupational health and safety management systems.

GRI 2-25 To support the implementation of the Environmental Policy of ROSATOM and its organisations and ensure compliance with environmental legislation, a three-year Comprehensive Plan for the Implementation of the Environmental Policy of ROSATOM and its Organisations has been developed and approved; it includes operational and technical measures to be implemented by the organisations in order to reduce the negative impact of their operations on the environment, among other things.

A five-year industry-wide action plan has been developed to minimise the negative impact of ROSATOM on the environment until 2025; it is aimed at reducing the negative impact on the atmosphere and the climate impact, reducing emissions and the use of ozone-depleting substances, reducing the negative impact of waste on the environment, on water bodies, on biodiversity and its conservation, and reducing the negative impact on soil, land resources and subsoil; it also includes measures aimed at improving energy efficiency, controlling and monitoring the impact on various components of the environment and indicates expected environmental benefits from these measures.

In order to meet statutory requirements, a greenhouse gas emissions accounting system has been established in the nuclear industry, and steps are being taken for its further improvement.

As part of Russia's commitment to comply with the requirements of the Stockholm Convention on Persistent Organic Pollutants, an inventory of equipment and waste containing polychlorinated biphenyls has been compiled in ROSATOM's organisations, and plans are being developed for the decommissioning of such equipment and the transfer of waste for decontamination/disposal.

Commissions under ROSATOM's General Inspectorate communicate with representatives of regional departments of federal executive authorities as part of inspections and preventive visits to the organisations. ROSATOM's Public Council as a collective expert body facilitates communication and cooperation between the Corporation's organisations and individuals, non-profit organisations, regional and local governments in Russia and abroad.

In order to minimise environmental risks, during the reporting period, ROSATOM consistently implemented comprehensive preventive measures approved by the Corporation's Director General to prevent potential environmental damage from its operations:

- seven measures implemented ahead of schedule).
- Russian Federation.
- of Greenhouse Gas Emissions.

Financing of environmental measures

In 2022, expenditure on environmental protection in JSC Atomenergoprom's organisations totalled RUB 17.39 billion, including expenditure on environmental measures totalling RUB 12.69 billion and fixed asset investment for environmental purposes totalling RUB 4.70 billion.

Environmental costs increased by RUB 4.62 billion in 2022 compared to 2021. The increase was driven mainly by an increase in investments in water recycling systems at Kursk NPP.

Allocation of JSC Atomenergoprom's environmental costs, RUB billion



Expenditure on environmental mea

Fixed asset investment for environi

Total

1. Directive of ROSATOM on Approval of an Action Plan to Minimise the Negative Impact from ROSATOM on the Environment until 2025. In 2022, performance of nuclear organisations against the targets set in the Action Plan stood at 130.4% (23 measures were planned; 30 measures were implemented, with

2. Directive of ROSATOM on Approval of a Road Map for the Adaptation of ROSATOM and its Organisations to Climate Change Given the Introduction of State Regulation of Greenhouse Gas Emissions in the

3. Order of ROSATOM on the Establishment of an Industry-Wide Working Group on the Planning of Measures for the Adaptation of the Industry to Climate Change and the Introduction of State Regulation

ndicator	2021	2022
sures	11.72	12.69
nental purposes	1.05	4.70
	12.77	17.39



A major part of fixed asset investment was allocated for the protection and sustainable use of water resources (80.9%) and the protection of the atmosphere (15.3%). JSC Atomenergoprom's organisations account for 1.6%⁷³ of the total amount of environmental investment in the Russian Federation.

GRI 2-27 Environmental charges and fines

Environmental charges

In 2022, charges for the negative environmental impact totalled RUB 94.9 million, including charges for allowable emissions and discharges of pollutants, disposal of industrial and consumer waste totalling RUB 25.3 million (26.7%), and charges for excess emissions and discharges totalling RUB 69.6 million (73.3%).

Charges for the negative environmental impact, RUB million

Indicator	2021	2022
Charges for allowable emissions (discharges) of pollutants (disposal of industrial and consumer waste), total, including:	28.9	25.3
into water bodies	3.8	2.3
into the atmosphere	2.4	3.5
for the disposal of industrial and consumer waste	22.7	19.5
Charges for excess emissions (discharges) of pollutants (disposal of industrial and consumer waste), total, including:	60.3	69.6
into water bodies	7.8	23.9
into the atmosphere	8.6	0.8
for the disposal of industrial and consumer waste	43.9	44.9
Charges for allowable and excess emissions (discharges) of pollutants (disposal of industrial and consumer waste), total	89.2	94.9

73. Calculated based on data provided in the Government Report on the Status and Protection of the Environment of the Russian Federation in 2021.

Environmental fines

- administrative penalties in the form of fines.
- RUB 0.67 million⁷⁴.

The number of administrative violations detected during the reporting period was 1.89 times (47.1%) lower than in 2021, while the total amount of fines decreased by a factor of 3.29 (69.6%).



Pollutant emissions into the atmosphere

All organisations of JSC Atomenergoprom are directly involved in managing the radiation impact on the environment, including significant organisations managing the Company's Divisions, such as JSC Atomenergomash, JSC Rosenergoatom, JSC TVEL, JSC Atomredmetzoloto, etc.

In 2022, pollutant emissions into the atmosphere totalled 33,000 tonnes; the pollutant capture rate reached 90.9%. Nuclear organisations (including those of JSC Atomenergoprom) accounted for 0.2% of the total volume of emissions in the Russian Federation⁷⁵.

In 2022, government supervision agencies in the field of environmental protection detected nine violations in organisations within the scope of consolidation of JSC Atomenergoprom, for which they imposed

Fines levied on JSC Atomenergoprom's organisations for environmental non-compliance totalled



^{74.} The violations are attributed to the year in which the fine was paid.

Pollutant emissions into the atmosphere⁷⁶, '000 tonnes

	2021	2022
Total, including:	30.9	33.0
Particulate emissions	11.8	10.1
NO _x emissions	6.2	8.8
SO ₂ emissions	9.0	9.8
CO emissions	2.4	2.8
Hydrocarbon emissions, including:	1.2	1.2
Methane emissions	0.1	0.1
Volatile organic compounds	0.9	0.8
Other gaseous and liquid compounds	0.3	0.3
Other hydrocarbons	0.2	0.3

Pollutant emissions into the atmosphere increased by 2,100 tonnes compared to 2021 as data on the branch of JSC RIR in Ozersk were recorded for the full reporting year (the branch has been controlled by the Company since September 2021).

Pollutant emissions from individual groups of pollution sources, '000 tonnes

Substance	From fuel combustion for electricity and heat generation	From production and other processes
Particulate matter	9.3	0.8
NO _x	8.0	0.8
SO ₂	9.2	0.6
со	2.0	0.8
Hydrocarbons, including volatile organic compounds (excluding methane)	0.01	0.9

76. Pollutant emissions are reported by the Company's organisations using chemical analysis methods or automatic gas analysers. Hereinafter in Section 9.2, changes in the figures are shown for 2021 and 2022, as no statistics were kept on organisations within the scope of JSC Atomenergoprom under IFRS until 2021

Substance	2021	2022
Dichlorodifluoromethane (Freon 12)	72.24	14.05
Chlorodifluoromethane (Freon 22)	0.05	0.13
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.00	0.00
Chlorotrifluoromethane (Freon 13)	164.21	123.75
Tetrafluoromethane (Freon 14)	6.24	0.24
Total	242.74	138.17

Emissions of ozone-depleting substances decreased in 2022 as a result of the use of instrumental methods for measuring dichlorodifluoromethane (Freon 12) emissions and a reduction in the equipment operating time at JSC Chepetsk Mechanical Plant.

Initiatives to reduce harmful emissions into the air

Key measures implemented in 2022 included the following:

- emissions into the atmosphere;
- electrical products and galvanic coatings;
- Seversk branch of JSC RIR;
- 99.5%.

Greenhouse gas emissions

Federal Law No. 296-FZ of 2 July 2021 on Limiting Greenhouse Gas Emissions establishes a regulatory framework for greenhouse gas emission control in the Russian Federation.

In order to meet statutory requirements, a greenhouse gas emissions accounting system has been established in the nuclear industry, and steps are being taken for its further improvement. In 2022, a framework high-level document was updated: the Regulations on a System for Accounting for Greenhouse Gas Emissions Generated by the Operations of ROSATOM's Organisations in the Russian Federation. A list of organisations included in the industry-wide system for accounting for greenhouse gas emissions from organisations located in the Russian Federation and producing direct greenhouse gas emissions was compiled in accordance with the provisions of Federal Law No. 296-FZ of 2 July 2021. The threshold for the

Emissions of major ozone-depleting substances, tonnes of chlorofluorocarbon-11 equivalent⁷⁷

 Air conditioning systems continued to be upgraded in the Rostov NPP branch of JSC Rosenergoatom (Power Engineering Division). This is expected to eliminate the use of 800 kg of ozone-depleting Freon R22 in autonomous air conditioners at power unit No. 1;

 An ammonia intake, storage and supply facility (room OVK-13) was upgraded in the Kola NPP branch of JSC Rosenergoatom (Power Engineering Division), resulting in a 50% reduction in ammonia

- In JSC Afrikantov OKBM (Mechanical Engineering Division), a GOU FVG-M-6,4-Sch scrubber was replaced with a more efficient wet gas scrubber, GM4-800-FVG-PP, in a workshop manufacturing

- Protective casings were installed for flange joints of oil pressure lines of turbine unit No. 1 in the

- In JSC CDBMB (Mechanical Engineering Division), the welding area in building 251A was equipped with three cantilever-type fume extraction systems, ensuring the pollutant removal efficiency of up to

^{77.} The data are presented taking into account the ozone depletion potential of substances under the Montreal Protocol on Substances that Deplete the Ozone Layer The calculations have been made for those ozone-depleting substances that are reported in Form 2-TP (Air) as specific pollutants.

inclusion in the industry-wide system has been set at 20,000 tonnes or more of CO₂ equivalent per year (according to the Russian methodology), which is a more ambitious target compared to the regulatory threshold set at 150,000 tonnes of CO₂ equivalent per year.

The said list includes 22 organisations (legal entities and branches) in the nuclear industry that report on greenhouse gas emissions in the form approved by Decree No. 707 of the Government of the Russian Federation dated 20 April 2022. Work is underway to establish an industry-wide greenhouse gas emission management system and calculate greenhouse gas emissions in accordance with international methods (Scope 1 and Scope 2).

> (For details, see the section 'Assessment of Greenhouse Gas Emissions, Contribution to the Climate Agenda').

In 2022, direct greenhouse gas emissions from JSC Atomenergoprom's organisations included in the industry-wide accounting system according to the Russian methodology totalled 16,386,800 tonnes, or 16,421,700 tonnes of CO₂ equivalent⁷⁸.

Gross direct greenhouse gas emissions from JSC Atomenergoprom's organisations in the Russian Federation, 000 tonnes

Substance	Indicator in 2022
Carbon dioxide	16,386.8
Methane	0.0
Nitrous oxide	0.0
Trifluoromethane	0.0
Perfluoromethane	0.005
Perfluoroethane	0.0
Sulphur hexafluoride	0.0
Total	16,386.805

Impact on local flora and fauna

The high quality of the natural environment is a vital prerequisite for the existence of mankind on Earth. Global environmental problems, such as the greenhouse effect and associated irreversible climate change, the depletion of the ozone layer and a rising level of toxic substances in the environment, ultimately lead to a reduction of biodiversity on the planet.

In terms of environmental performance, nuclear power is much more advantageous than thermal power, since nuclear power plants consume no oxygen and do not emit a significant amount of harmful chemicals into the atmosphere. Environmental protection measures are beneficial to living organisms, including human beings. At the same time, the nuclear industry, primarily nuclear power plants, is subjected to close scrutiny by various environmental organisations, the general public and the media due to the potential radiation impact of nuclear power plants on the environment.

Nuclear organisations operating nuclear facilities regularly monitor radionuclide content in local agricultural products, wild-growing foods (berries, mushrooms, etc.) and fodder growing in radiation control areas, as well as in fish and other aquatic organisms living in cooling ponds at NPPs. The specific activity of doseforming radionuclides is monitored in food products. Regional offices of the Russian Federal Medical and Biological Agency (FMBA) conduct independent radiation monitoring of the environment and locally produced food: radiation monitoring of abiotic components of the environment is carried out by the Federal Service for Hydrometeorology and Environmental Monitoring (Roshydromet).

The results of long-term radiation monitoring show that the content of radioactive substances in various types of crops corresponds to the background radiation level, that the species composition of flora and fauna is practically unchanged, with no hazards that can affect their existence, and that the growth rate of the amount of dead wood is within permissible limits.

In addition, the close proximity of NPPs to nature reserves also provides evidence of biodiversity conservation at their locations. The Lapland State Nature Reserve is located within a 30-kilometre radius of Kola NPP, and 16 nature monuments and 33 wildlife sanctuaries are located within a 30-kilometre radius of Kalinin NPP. This shows that the radiation impact of nuclear technologies and production facilities on the natural environment poses no danger to living organisms or their habitat and, accordingly, cannot be assessed as negative.

- followina:

 - getting drawn into them:
 - these units and mechanisms:
 - Installing bird diverters on power lines;

 - lots for them;

 - and to prevent the death of living organisms in fires;

In the Russian Federation, there are no criteria for quantitative assessment of the radiation impact on flora and fauna, and in the vast majority of cases the assessment of such impacts is viewed as supplementary to

GRI 304-3 All organisations in the nuclear industry take measures to prevent the degradation of natural ecosystems as a result of their operation. Measures aimed at preserving the diversity of flora and fauna include the

Equipping tailings ponds with bird deterrents to prevent birds from landing on the water surface;

- Equipping water intake facilities with fish screens in order to prevent young fish from swimming or

 Equipping transformer substations, their components and operating mechanisms with special devices (fences, casings, etc.) to prevent animals from entering the premises of the substation and getting into

- Maintaining fences along the perimeter of industrial sites in good condition, including in order to prevent animals from entering the premises of an organisation;

Ensuring that motor vehicles and special machinery travel on paved roads and providing special parking

- Using machines and mechanisms that are in good condition, with adjusted fuel fittings preventing losses of fuel and lubricants and their spills onto the ground and vegetation;

- Measures to protect the atmosphere, which help to minimise the amount of pollutants inhaled by animals and humans, as well as the deposition of pollutants on vegetative parts of plants, further spread of harmful substances along the food chains and their accumulation in living organisms;

 Arranging waste accumulation sites compliant with technical and sanitary standards; removing waste and transporting it to designated locations in a timely manner;

Fire prevention measures in order to ensure that industrial sites comply with fire safety requirements.

the setting of hygienic standards.

^{78.} Including PJSC Quadra - Power Generation.

- Measures to provide protection against noise exposure (using equipment that is less noisy; more effective soundproofing. etc.):
- Lighting of industrial sites at night.
- In 2022, JSC Atomenergoprom's organisations took the following steps to replenish aguatic wildlife:
- At Balakovo NPP, 78,795 juvenile grass carp, 78,795 juvenile silver carp, 158,914 juvenile common carp and 73,678 juvenile sterlets were released into the Saratov Reservoir;
- At Beloyarsk NPP, 269,997 juvenile bighead carp were released into the Beloyarsk Reservoir;
- At Kalinin NPP, Lake Pesvo and Lake Udomlya were stocked with black carp bred during the year weighing a total of 1,038 kg;
- At Novovoronezh NPP, 6 tonnes of juvenile silver carp were released into the cooling pond;
- At Rostov NPP, 418,807 juvenile grass carp, 856,128 juvenile common carp and 34,030 juvenile sterlets were released;
- 101,000 juvenile chum salmon were released at the FTNPP into the Trezubets Stream (the Paratunka River basin) in the Kamchatka Territory:
- JSC Siberian Chemical Plant released 34.980 kg of juvenile fish into the Tom River;
- JSC Khiagda released 163,000 grayling fry into the Ina River in the Barguzinsky District of the Republic of Buryatia.

GRI 3-3 Restoration of disturbed land

GRI 304-3

In 2022, JSC Atomenergoprom's organisations carried out reforestation activities, with the area of restored forests totalling 233.75 hectares.

Land rehabilitation in the Company's organisations, hectares

OprOrganisation	2021	2022
JSC Lunnoye	0.00	41.05
JSC ZIO-Podolsk	0.10	0.05
PJSC NCCP	0.00	2.45
JSC Siberian Chemical Plant	0.00	0.00
Total	0.10	43.55

Reforestation activities in JSC Atomenergoprom's organisations, hectares

Organisation	2021	2022
JSC Dalur	59.70	41.05
JSC Khiagda	0.00	174.20
Leningrad NPP	19.5	19.50
Total	79.20	233.75

Industrial and consumer waste management

As an environmentally responsible company, JSC Atomenergoprom recognises the high importance of industrial and consumer waste management.

Companies managed by JSC Atomenergoprom include JSC Rusatom Greenway, the industry-wide environmental integrator for industrial and consumer waste management. JSC Rusatom Greenway operates in accordance with the uniform industry-wide environmental policy of ROSATOM and JSC Atomenergoprom; it complies with international environmental standards and adheres to the principles of transparency and openness in the course of its operations.

The main rules of the industry-wide environmental policy are as follows:

- protection;

In 2022, nuclear organisations generated 27.8 million tonnes of industrial and consumer waste. 99.98% of the generated waste is hazard class 4 and 5 waste (low-hazard and virtually non-hazardous waste). An increase in the volume of waste generated in 2022 was due to an increase in the amount of loose overburden produced in PJSC PIMCU. Most of the waste is class 5, which is the least hazardous waste. Industrial and consumer waste generated in JSC Atomenergoprom's organisations accounted for 0.3% of the total volume of waste generation in Russia in 2022⁷⁹.

98.4% of the total amount of waste generated and received by JSC Atomenergoprom's organisations was recycled; 0.005% was treated. The weight of transferred waste totalled 123,322 tonnes, including 14,200 tonnes of solid household waste transferred to a regional operator.

Industrial and consumer waste management, '000 tonnes

Year	Amount at the beginning of the year	Waste generated and received during the year	Recycling and generated and Amount	l treatment of received waste %	Transferred to third-party organisations	Storage in enterprises	Amount at the end of the year
2021	442,195.114	23,503.583	22,966.723	97.7	123.734	430.672	442,841.679
2022	442,538.899	27,795.482	27,351.997	98.4	123.322	303.838	442,835.841

Compliance with regulatory requirements and standards for environmental safety and environmental

 Taking into account environmental factors and assessing potential negative environmental impacts in the course of planning and operations as a priority and a mandatory requirement;

- A science-based approach to making environmentally significant decisions.

79. Calculated based on data provided in the Government Report on the Status and Protection of the Environment of the Russian Federation in 2021

In 2022, JSC Atomenergoprom's organisations did not transport, import, export or process waste classified as 'hazardous' according to Annexes I, II, III, and VIII of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.

Industrial and consumer waste management⁸⁰ by hazard class in 2022, '000 tonnes

Waste hazard class	Amount at the begin- ning of the year	Waste gen- erated and received in the report- ing year	Recycling o ated and re wast '000 tonnes	f gener- eceived e %	Treatin genera receive '000	nent of ted and d waste %	Transfer of waste to third- party organisa- tions	Waste sto sites ope the Comp reporting ton Total	red at the erated by any in the year, '000 nes Including	Amount at the end of the year
			And Providence of Control		tonnes		10	No. Contraction	buriai	
Class 1	0.012	0.074	0.000	0.0	0.0001	0.0	0.054	0.00001	0.000	0.032
Class 2	0.020	1 452	0.000	0.0	1 222	0.005	0.000	0.000	0.000	0.052
Class 2	0.020	1.455	0.000	0.0	1.323	0.005	0.099	0.002	0.000	0.052
Class 3	0.458	5.444	0.015	0.00001	0.000	0.0	5.426	0.0005	0.000	0.461
Class 4	4,441.647	49.606	0.383	0.001	0.000	0.0	45.772	3.211	2.332	4,442.766
Class 5	438,096.762	27,738.903	27,350.276	98.4	0.000	0.0	71.971	300.625	20.881	438,392.538
TOTAL	442,538.899	27,795.482	27,350.674	98.4	1.323	0.005	123.322	303.838	23.213	442,835.841

Emissions and discharges of radionuclides

Emissions of radionuclides

JSC Atomenergoprom's organisations operated steadily in 2022; there were no accidents or incidents that could have had a negative impact on the environment.

The total activity of radionuclides released into the atmosphere by organisations within the scope of consolidation of JSC Atomenergoprom in 2022 amounted to 5.25•10¹⁵ Bg. Beta-emitting radionuclides accounted for 86.17% of the total activity (4.52•10¹⁵ Bg).

Actual and permitted emissions of radionuclides by JSC Atomenergoprom's organisations in 2022

Type of radionuclides	Permitted emission, Bq	Actual emission, Bq	Percentage of the permitted level
Alpha-emitting	5.41•10 ¹⁵	7.26•10 ¹⁴	13.41
Beta-emitting	2.92•10 ²¹	4.53•10 ¹⁵	0.0002

Discharges of radionuclides

JSC Atomenergoprom's organisations discharged 23.56 million m³ of wastewater with a total activity of 3.81•10¹³ Bg into surface water bodies.

Manufacturing Plant.

Actual and permitted radionuclide discharge by JSC Atomenergoprom's organisations in 2022



Beta-emitting

Contaminated sites and their remediation

25.29 km², including:

- 24.03 km² at industrial sites:
- 0.76 km² in buffer areas;
- 0.51 km² in radiation control areas.

uranium and its decay products.

In 2022, no site remediation was carried out in JSC Atomenergoprom's organisations.

GRI 3-3 Water use GRI 303-1

The nuclear industry is a major water user. The systematic approach to water use management is underpinned by water accounting data covering all water resources used in the industry (surface water, groundwater, reused and recycled water). Furthermore, industrial facilities are designed and their locations are selected with due regard for uneven geographical distribution of natural water resources. Wastewater guality assurance approaches and methods used by the Company are based on scientific research and are aimed at preserving the natural water quality and minimising pollutant discharges into water bodies, which ensures the sustainability of water resources in the regions of operation.

Water withdrawal and discharge for the needs of the Company's organisations is regulated by water use agreements and fully complies with prescribed limits.

Sustainable use of water resources is achieved through:

- The use of water recycling and reuse systems;
- Wastewater treatment using mechanical, biological, and physical and chemical methods;
- Minimising freshwater consumption in regions with access to seawater;
- Continuous monitoring of wastewater quality and compliance with statutory limits;
- The implementation of investment projects focused on the construction and renovation of wastewater treatment facilities and water supply networks.

Compared to 2021, wastewater discharges decreased by 5%, while the total activity decreased by 31.00%. The decrease in wastewater discharges compared to 2021 was driven by JSC MSZ Machinery

ted discharge, Bq	discharge, Bq Actual discharge, Bq	
1.16•10 ¹³	2.50•10 ¹⁰	0.21
2.04•1015	3.81•10 ¹³	1.87

At year-end 2022, the area of contaminated sites in JSC Atomenergoprom's organisations totalled

Radioactive contamination is caused mainly by caesium-137 and strontium-90 nuclides, as well as natural

^{80.} As from 1 January 2015, the term 'use' as a type of industrial and consumer waste management was legally replaced by the term 'recycling'; however, the scope of the concept has not changed. According to the definition given in Article 1 of Law No. 89-FZ, recycling is the use of waste for the manufacture of goods (products), performance of work and provision of services. According to this definition, reprocessing and reuse are waste recycling options.

In 2022, water withdrawal from natural sources by nuclear organisations made up 8.5% of the total water withdrawal in the Russian Federation⁸¹. The main water consumers among the Company's organisations are Leningrad NPP and Kola NPP (75.9% of the total water withdrawal).

In the reporting year, water withdrawal by JSC Atomenergoprom's organisations totalled 5,447.9 million m³, which is 564.8 million m³ more than in 2021. This was primarily caused by a rise in seawater intake at Leningrad NPP due to an increase in power generation and the fact that electricity is produced by RMBK-1000 units with once-through cooling systems.

GRI 303-3 Total water withdrawal, million m³

Source	2021	2022
Seawater	2,665.7	2,926.3
Fresh surface water, including rivers, marshes and lakes ⁸²	2,142.2	2,441.7
Groundwater	65.8	69.4
Water from third-party organisations	9.4	10.5
Total	4,883.1	5,447.9

Volume of recycled and reused water, million m³

Indicator	2021	2022
Total volume of recycled and reused water, million m ³	37,781.0	37,572.7
Water withdrawal, million m ³ (% of recycled and reused water)	4,883.1 (12.9%)	5,447.9 (14.5%)
Total, million m ³	42,664.1	43,020.6
Share of recycled and reused water in water withdrawal, %	773.7	689.7

The volume of water used by JSC Atomenergoprom's organisations for their own needs in 2022 totalled 5.381.8 million m³, which is 563.1 million m³ more than in 2021. This was mainly due to an increase in water consumption at Leningrad NPP.

Water consumption for own needs, million m³

Type of consumption	2021	2022
Drinking and sanitary purposes	25.8	27.1
Operational needs	4,759.7	5,323.8
Other types	33.2	30.9
Total	4,818.7	5,381.8

GRI 303-2 Water discharge

JSC Atomenergoprom manages all its negative impacts in compliance with the standards set in laws and regulations of the Russian Federation, which stipulate the necessary tools for identifying and controlling pollutant discharges.

81. Calculated based on data provided in the Government Report on the Status and Protection of the Environment of the Russian Federation in 2021.

All organisations in the nuclear industry discharge wastewater within the established limits and have the relevant permits. The level of pollutants subject to state environmental regulation⁸³ in wastewater is monitored by in-house laboratories as part of industrial environmental control; compliance with statutory limits is confirmed as part of monitoring and supervision by the Federal Service for Supervision of Natural Resources. In some cases, water from natural water sources does not meet guality standards, and an organisation withdraws water that has already been contaminated for its own needs. Such water is also treated before discharge to ensure compliance with statutory limits, where possible. In the reporting year, six organisations of JSC Atomenergoprom exceeded statutory limits on discharges of pollutants set in accordance with the Methodology for the Setting of Statutory Limits on Discharges of Pollutants into Water Bodies for Water Users⁸⁴.

In 2022, wastewater discharge by JSC Atomenergoprom's organisations totalled 4,807.4 million m³, with clean water compliant with regulatory requirements accounting for 96.1% of the total volume, while the share of treated wastewater compliant with regulatory requirements and contaminated wastewater stood at 0.4% and 3.5% respectively.

(8.6%).

In the reporting year, wastewater discharge increased by 596.9 million m³ compared to 2021 mainly due to an increase in discharges from Leningrad NPP into the Gulf of Finland in the Baltic Sea.

In 2022, discharge of treated wastewater compliant with regulatory reguirements totalled 17.3 million m³, of which 16.9% was treated using the biological method, 0.01% was treated using the physical and chemical method, and 83.1% was treated using the mechanical method.

GRI 303-4 Contaminated wastewater discharge by nuclear organisations accounted for 1.5% of the total volume of discharges in Russia in 2022⁸⁵.

Total wastewater discharge in 2022, million m³

Total wastewater discharge	4,807.4
Total volume of discharges with a breakdown by destination, including:	4,807.4
Surface water, including marshes, rivers and lakes	1,939.8
Groundwater	0.8
Seawater	2,866.8

Total volume of wastewater discharges, million m³

Wat

Clean water compliant with regulat

Treated wastewater compliant with

Contaminated wastewater

TOTAL

83. According to the List of Pollutants Subject to Government Regulation in the Field of Environmental Protection approved by Decree No. 1316 of the Government of the Russian Federation dated 8 July 2015.

84. Order No. 1118 of the Ministry of Natural Resources and Environment of Russia dated 29 December 2020.

85. Calculated based on data provided in the Government Report on the Status and Protection of the Environment of the Russian Federation in 2021

In the structure of wastewater discharge, the main destinations are seas (59.6%), lakes (29.7%) and rivers

er category	2021	2022
ory requirements	4,052.7	4,619.8
regulatory requirements	22.6	17.3
	135.2	170.3
	4,210.5	4,807.4

Including water received from water supply organisations.

Pollutant content in wastewater, kg

Pollutant	2021	2022
Chemical oxygen demand	13,615,208.852	5,560,506.694
Suspended matter	1,670,753.000	2,455,203.000
Phosphates (phosphorus contained)	26,401.000	29,919.000
Hexavalent chromium	24.898	54.599
Trivalent chromium	42.754	112.906
Manganese	605.761	616.855
Iron	21,164.468	32,691.304
Nickel	52.203	61.860
Copper	365.581	525.250
Zinc	493.985	640.017
Molybdenum	457.754	622.000
Lead	3.074	4.460

Initiatives to reduce discharges of harmful substances into water bodies

Key measures implemented in 2022 included the following:

- PJSC PIMCU (Mining Division) carried out comprehensive tests of process equipment and process lines of the mine water treatment plant at Mine No. 6 in the pre-commissioning and operating modes;
- In the Kola NPP branch of JSC Rosenergoatom (Power Engineering Division), major repairs of secondary sedimentation tanks of packaged sewage treatment plants were carried out to improve the quality of biological wastewater treatment;
- In the Atommash branch of JSC AEM-Technologies (Mechanical Engineering Division) in Volgodonsk, pipelines, floatation units and tanks of industrial wastewater treatment facilities were flushed, which enabled a 5% increase in the efficiency of industrial wastewater treatment;
- In JSC Chepetsk Mechanical Plant (Fuel Division), the use of recycled water for equipment cooling was introduced in the granulation section of workshop No. 5, which reduced water consumption by 9,213 m³ per year.

Environmental impact forecast, plans for 2023 and for the medium term

The organisations of JSC Atomenergoprom will continue to systematically reduce the negative environmental impact and take steps to prevent climate change as part of the Action Plan to Minimise the Negative Impact of ROSATOM on the Environment until 2025.

In addition, the following steps will be taken:

- Continuing to pursue the policy of sustainable use of natural resources and implementing a number of measures to reduce the discharge of contaminated wastewater;
- Further reducing hazardous waste generation:
- organisations are located;

Improving energy efficiency

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

Responsibility for implementing the energy efficiency policy in ROSATOM and JSC Atomenergoprom lies with the Economic Analysis and Operational Efficiency Management Department.

An Energy Conservation and Energy Efficiency Improvement Programme of ROSATOM for the period from 2018 through 2022 has been approved in the nuclear industry by order of the Director General of ROSATOM.

The Programme is aimed at:

- by ROSATOM's organisations:

Objectives of the Programme include:

- equipment, and reducing the environmental footprint;
- conditions) against the base year.

Results in 2022⁸⁷

shown in the tables below.

Maintaining fixed asset investment related to environmental protection at the current level;

- Expanding and improving radiation and chemical monitoring systems in the areas where the Company's

- Developing plans in the organisations for the decommissioning of PCB-containing equipment and the transfer of such equipment (including waste) for decontamination/disposal.

1. Systematisation and continued implementation of energy conservation and energy efficiency initiatives

2. Annual reduction of energy consumption in accordance with the targets of the Government Programme of the Russian Federation 'Development of the Nuclear Power and Industry Complex'86.

1. Increasing the sustainable use of heat and electricity by introducing energy-saving technologies and

2. Achieving an annual reduction in energy consumption by ROSATOM's organisations (under comparable

Data on energy consumption and energy cost allocation with a breakdown by Division and complex are

^{86.} Approved by Decree No. 506-12 of the Government of the Russian Federation dated 2 June 2014. 87. According to the reports of nuclear organisations in the Corporation's information system (the Automated Energy Efficiency Management System, hereinafter

referred to as the AEEMS).

Energy consumption by JSC Atomenergoprom in physical terms in 2022

and also	Heat		Water		Electric	ity	Other (gas, fuel oil)		
Division/complex	Actual consump- tion under compara- ble condi- tions, '000 Gcal	%	Actual consump- tion under comparable conditions, '000 m ³	%	Actual consump- tion under comparable conditions, '000 kWh	%	Actual consump- tion under comparable conditions, tonnes of fuel equivalent	%	
JSC Atomredmetzoloto	591.33	1.23	3,668.32	2.89	530,907.68	3.02	-	-	
JSC Atomenergomash	48.23	4.52	1,531.21	37.77	159,506.79	2.16	65,510.83	3.57	
JSC Rosenergoatom	410.02	2.32	1,210,119.41	0.44	984,804.95	0.97	-	-	
Other	2,343.27	3.33	607,709.68	-4.36	3,260,335.55	0.59	2,556,396.21	1.92	
Total across JSC Atomenergoprom	3,392.85	2.86	1,789,867.33	-1.07	4,873,382.78	0.96	2,621,907.04	1.96	

Energy cost savings in JSC Atomenergoprom in 2020 (against 2015 as the base year, excluding VAT) and in 2021 and 2022 (against 2020 as the base year, excluding VAT)

2019		202	0	20	21	2022		
RUB million	%	RUB million	%	RUB million	%	RUB million	%	
1,735.83	8.17	1,668.77	8.25	231.98	0.96	336.67	1.25	

Implementation of new import substitution technologies that contribute to the technological sovereignty of the Russian Federation

JSC Atomenergoprom's organisations work continuously to achieve the strategic goal of developing new products for the Russian and international markets, which involves increasing the share of import substitution products relevant to energy conservation.

In order to replace imports and meet the demand for lighting fittings, JSC Khiagda continued to produce high-performance lighting products (LED lamps) used in industry enterprises. More than 3,000 lamps have been sold since 2021.

The Company's organisations have implemented most elements of an energy management system compliant with the ISO 50001 international standard (the organisations of JSC Rosenergoatom and JSC TVEL have obtained international certificates; organisations in other Divisions have implemented individual elements of the system).

Organisations in the industry use the AEEMS information system (the Automated Energy Efficiency Management System of ROSATOM) for reporting on energy conservation and improvement of energy efficiency.

In addition, in order to comply with the requirements of Federal Law No. 261-FZ of 23 November 2009 on Energy Conservation and on Increasing Energy Efficiency and on Amending Certain Laws of the Russian Federation, in 2022, energy conservation and energy efficiency improvement programmes were approved for the period from 2023 through 2027 in ROSATOM and its organisations (including JSC Atomenergoprom), which involve migrating the AEEMS to software that does not rely on imported solutions.



50

Plans for 2023 and for the medium term

In 2022, the energy conservation target was 0.5% higher that the target set as part of the Government Programme 'Development of the Nuclear Power and Industry Complex'; accordingly, the following differentiated energy conservation targets were set for 2023 and included in the KPI maps of executives of the Company's Divisions/complexes (against 2020 as the baseline), providing for outperformance against the targets set in the Government Programme for the current year.

Division/complex	Energy conservation targets for 2022 (%)
JSC Atomredmetzoloto	1.70
JSC Atomenergomash	2.10
JSC Rosenergoatom	0.70
JSC Science and Innovations	0.60
JSC RIR	1.50
Other	from 0.80 to 5.60

Between 2023 and 2027, the Company plans to:

- Programmes;
- industry ratings) on an annual basis;
- industry and continuously improve their performance;
- improve sustainability maturity in the industry;
- Update the Company's scope of reporting;

Number of JSC Atomenergoprom's organisations covered by the AEEMS



Monitor progress on scheduled energy audits in organisations in the industry;

 Monitor updates to Energy Conservation Programmes approved by organisations with energy costs exceeding RUB 50 million per year for the next five years following the completion of the current

- Assess the outcomes of energy conservation measures implemented by the organisations (assign

- Maintain the energy efficiency management and energy management systems implemented in the

- Achieve additional synergy between energy conservation initiatives and the Company's efforts to

Continuously improve the range of functions of the AEEMS.



APPENDIX 1.

Report Profile

The Public Annual Report (hereinafter referred to as the Report) of Joint-Stock Company Atomic Energy Power Corporation (JSC Atomenergoprom) for 2022 provides an integrated account of the Company's strategy and key financial, economic and operating results for the reporting year. The Report also outlines the Company's health, safety and environmental performance, its contribution to the development of the towns and cities where nuclear facilities are located, implementation of the social policy and other aspects of sustainable development.

GRI 2-3 JSC Atomenergoprom publishes its reports on a yearly basis. The previous annual report was published on 30 May 2022. The publication date of the 2022 Annual Report is no later than 31 May 2023.

This Report covers the operating results of the Company and its organisations within the scope of consolidation in accordance with IFRS (hereinafter referred to as the organisations of JSC Atomenergoprom) for the period from 1 January through 31 December 2022. It also discloses some information on and the results of the Russian nuclear industry as a whole. The reporting period for financial reporting coincides with the reporting period for the annual report.

GRI 2-14 The annual report of JSC Atomenergoprom is approved by the Board of Directors.

Standards and regulatory requirements

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

- The Uniform Industry-Wide Policy of State Atomic Energy Corporation Rosatom on Public Reporting and the Uniform Industry-Wide Methodological Guidelines (Standard) on Public Reporting of State Atomic Energy Corporation Rosatom and Its Organisations;
- The Global Reporting Initiative Sustainability Reporting Standards: this Report has been prepared in accordance with the GRI Standards:
- Federal Law No. 208-FZ on Joint-Stock Companies dated 26 December 1995;
- Regulations of the Bank of Russia No. 714-P on Disclosure of Information by Issuers of Issue-Grade Securities dated 27 March 2020.

GRI 3-1 Process for determining the materiality of disclosures

GRI 3-2 Material topics to be disclosed in the Report were identified in several stages as part of the process of identifying material topics to be disclosed in ROSATOM's public report for 2022 and their decomposition in the Company's public reports.

Following an analysis of the business context, ROSATOM's Communications Department identified the impacts (economic, environmental and social) made by ROSATOM and Atomenergoprom. Stakeholders and experts assessed these impacts, which were then prioritised by experts and consumers of information. Based on this, the Company formulated the following material topics to be disclosed in the Report:

- 2. Technological sovereignty.
- 4. Promoting the well-being of our employees.

The list of material topics was revised compared to the previous reporting period (see JSC Atomenergoprom's Annual Report for 2021) due to changes in the methodology for identifying material topics set out in the GRI SRS standards (the 2021 version) and given the prioritisation of material topics to be disclosed in the 2022 Report based on stakeholder engagement.

GRI 2-5 Verification of reporting information

Reporting information was certified as accurate and reliable by an independent auditor which certifies the annual financial statements. Non-financial reporting information was certified as accurate and reliable by an independent auditor which assured compliance of the Report with the GRI Standards.

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.

1. Contribution to industrial development in the Russian Federation.

3. Nature conservation and ensuring environmental safety in the country.

5. Developing the regions of operation and improving the standard of living.

APPENDIX

GRI Content

PF	PENDIX 2	2.				CPI	Disalasuma	Section		Omission	
RI C	Content I	ndex				Standard	Disclosure	Section	Requirements omitted	Reason	
						GRI 2: General Disclosures 2021	2-3 Reporting period, frequency and contact point	Appendix 1, p. 188 Contact Details, p. 205			
9		JSC Atomenergoprom has r period from 1 January throu	eported in accordan ugh 31 December 20	ce with the GRI Sta 22.	ndards for the		2-4 Restatements of information	Financial results of Atomenergoprom and its			
		GRI 1: Foundation 2021						Divisions for 2021, as well as			
e	ctor Standard(s)	Not applicable						individual radiation risks have been recalculated.			
				Omission			2-5 External	Appendix 1 p 189			
	Disclosure	Section	Requirements omitted	Reason	Comments		assurance	The Company's policy with			
)	sures				- •			assurance is set out in the Uniform			
ı	2-1 Organisational details	Section 'Company Profile', p. 8 Section 'JSC Atomenergoprom						Industry-Wide Methodological Guidelines on Public Reporting of ROSATOM and Its Organisations.			
		Today', p. 12 Section 3.1 'International						The external assurance report is available on the website at https://report.rosatom.ru/aep			
		Business', p. 50									
		owned ⁸⁸									
							2-6 Activities, value chain and	Section 'JSC Atomenergoprom Today', p. 12			
	2-2 Entities	JSC Atomenergoprom's					other business relationships	Section 'Key Results in 2022', p. 16			
	organisation's sustainability	included in its financial statements under IFRS.						Section 'Financial and Economic Performance', p. 17			
	reporting	Material subsidiaries included in the financial statements under IERS are listed in note						Section 'Markets Served by Atomenergoprom and Value Chains', p. 37			
		38 thereto. Environmental disclosures in accordance with						Section 'Promoting JSC Atomenergoprom's			
		GRI 303 and GRI 304 and data on occupational injuries in accordance with GRI 403 do not						Technologies on Foreign Markets', p. 50			
		include PJSC Quadra – Power Generation. GRI disclosures that						Section 5.2 'Business Diversification', p. 82			
		belong to the Social category are reported within the scope of budget consolidation: GRI					2-7 Employees	Section 7.1 'Corporate			
		disclosures that belong to the Environmental category are					_ /p.c)ccc	Governance', p. 104			
		reported for all significant organisations within ROSATOM						Management', p. 130			
		which provide information on their environmental					2.8 Workers who	Section 8.1 (Percennel	Types of work	Lack of data on	
		performance using corporate reporting forms.					are not employees	Management', p. 131	performed by workers who are not employees	the types of work	ζ.
_							2-9 Governance structure and composition	Section 7.1 'Corporate Governance', p. 101			

88. With regard to 100% of ordinary shares that are voting shares.

GPI			Omission				
Standard	Disclosure	Section	Requirements omitted	Reason	Comments		
	2-10 Nomination and selection of the highest governance body	Section 7.1 'Corporate Governance', p. 101					
GRI 2: General Disclosures 2021	2-11 Chair of the highest governance body	Section 7.1 'Corporate Governance', p. 101					
	2-12 Role of the highest governance body in overseeing the management of impacts	Section 7.1 'Corporate Governance', p. 102					
	2-13 Delegation of responsibility for managing impacts	Section 2.2 'Sustainable Development Management', p. 34 Section 7.1 'Corporate Governance', p. 103					
	2-14 Role of the highest governance body in sustainability reporting	Appendix 1, p. 188					
	2-15 Conflicts of interest	Section 7.1 'Corporate Governance', p. 105 Competences of the Board of Directors related to preventing conflicts of interest are set out in paragraph 85 of JSC Atomenergoprom's Charter. None of the Board members own the Company's shares. Detailed information on cross- shareholding is provided in paragraph 2.1 of the issuer's report for the six months of 2022, p. 21. Information on related-party transactions is provided in paragraph 35 of the consolidated financial statements for 2022, p. 121.					
	2-16 Communication of critical concerns	Section 7.1 'Corporate Governance', p. 103 No critical concerns were reported in 2022.					

GRI Standard			Omission				
	Disclosure	Section	Requirements omitted	Reason	Comment		
	2-17 Collective knowledge of the highest governance body	Members of the Board of Directors did not undergo sustainability training in the reporting year.					
GRI 2: General Disclosures 2021	2-18 Evaluation of the performance of the highest governance body	Section 7.1 'Corporate Governance', p. 102					
	2-19 Remuneration policies	Section 7.1 'Corporate Governance', p. 105					
	2-20 Process to determine remuneration	Section 7.1 'Corporate Governance', p. 105					
	2-21 Annual total compensation ratio	The indicator has not been disclosed.	Ratio of the annual total compensation for the organisation's highest-paid individual to the median annual total compensation for all employees	The information is not available	Detailed dat on employe of the Corporation subsidiaries are not available. Nu methodolog for calculati the indicato has been approved. Ir 2023/2024, Company pl to examine the possibili of data consolidatio for the calculation of the indicato		
	2-22 Statement on sustainable development strategy	Message from the Management, p. 10					
	2-23 Policy commitments	Section 8.1 'Personnel Management', p. 145					
	2-24 Embedding policy commitments	Section 2.2 'Sustainable Development Management', p. 32					
	2-25 Processes to remediate negative impacts	Section 2.2 'Sustainable Development Management', p. 33 Section 9.1. 'Nuclear and Radiation Safety; Occupational Safety and Health', p. 164 Section 9.2 'Environmental Safety', p. 170					

CPI	Disclosure		Omission		
Standard		Section	Requirements omitted	Reason	Comments
	2-26 Mechanisms for seeking advice	Section 8.1 'Personnel Management', pp. 144–145			
GRI 2: General Disclosures 2021	2-27 Compliance with laws and regulations	Section 9.2 'Environmental Safety', p. 172 There were no significant instances of non-compliance with laws and regulations, i.e. instances that resulted in administrative suspension of JSC Atomenergoprom's	Information on fines (other than fines for environmental non-compliance)	The information is not available	Government and corporate statistical reports prepared by ROSATOM provide no statistics on this topic
	2-28 Membership associations	Section 3.1 'International Business', p. 50 Membership in associations			
		is maintained through the participation of JSC Atomenergoprom's organisations. More specifically,			
		JSČ NIKIET is a member of the Russian National Committee of the World Energy Council (an association of companies in the fuel and energy sector);			
		a number of JSC Atomenergoprom's organisations are members of the World Nuclear Association.			
	2-29 Approach to stakeholder engagement	Section 8.3 'Stakeholder Engagement', p. 151			
	2-30 Collective bargaining agreements	Section 8.1 'Personnel Management', p. 141			
GRI 3: Material Topics 2021	3-1 Process to determine material topics	Appendix 1, p. 188			
	3-2 List of material topics	Appendix 1, p. 188	_		
Contribution	to industrial develo	pment in the Russian Federati	ion		
GRI 3: Material Topics 2021	3-3 Management of material topics	Section 2.2 'Sustainable Development Management', p. 28 Section 8.2 'Developing the Regions Where Nuclear Facilities Are Located', p. 147 Section 5.2 'Business			

1

GRI	Disclosure		Omission		
Standard		Section	Requirements omitted	Reason	Comments
Promoting th	e well-being of our	employees			
GRI 3: Material Topics 2021	3-3 Management of material topics	Section 8.1 'Personnel Management', p. 132			
GRI 401: Employment 2016	401-1 New employee hires and employee turnover	8.1. 'Personnel Management', p. 131	In terms of breakdown by age group, gender and region	The information is not available	The indicator has been disclosed in part, with no breakdown by age group, gender and region, due to the lack of the relevant records. The Company plans to provide
					the required breakdown in the 2023 report.
GRI 404: Training and Education 2016	404-1 Average hours of training per year per employee	Section 8.1 'Personnel Management', p. 135			
	404-2 Programmes for upgrading employee skills and transition assistance programmes	Section 8.1 'Personnel Management', p. 135			
GRI 403: Occupational Health and Safety 2018	403-1 Occupational health and safety management system	Section 9.1 'Nuclear and Radiation Safety', pp. 160, 162			
	403-2 Hazard identification, risk assessment, and incident investigation	Section 9.1 'Nuclear and Radiation Safety', pp. 163, 167 In accordance with the Labour Code of the Russian Federation (Articles 216 and 379), the Cornoration's employees have			
		the right to refuse to perform work if there is a hazard to their life and health due to non- compliance with occupational safety requirements until the hazard has been eliminated, except as otherwise provided in federal laws.			

CPI			Omission					
Standard	Disclosure	Section	Requirements omitted	Reason	Comments			
	403-9 Work-related injuries	Section 9.1 'Nuclear and Radiation Safety', pp. 164–165	Injury rates for workers who are not employees but whose work and/or workplace is controlled by the organisation; micro-injuries (microtrauma) suffered by employees and requiring medical assistance beyond first aid	The information is not available	No records of hours worked by contractors are kept. No records of micro-injuries (microtrauma) with a breakdown by type of required medical assistance are kept.			
	403-10 Work- related ill health	Section 9.1 'Nuclear and Radiation Safety', p. 165	Information on work-related ill health for workers who are not employees but whose work and/or workplace is controlled by the organisation; information on fatalities as a result of work- related ill health	The information is not available	No occupational safety and health records are kept for these groups of employees.			
Developing th	ne regions of operat	ion and improving the standa	rd of living					
GRI 3: Material Topics 2021	3-3 Management of material topics	Section 8.2 'Developing the Regions Where Nuclear Facilities Are Located', p. 147						
GRI 203: Indirect Economic Impacts 2016	203-2 Significant indirect economic impacts	Section 8.2 'Developing the Regions Where Nuclear Facilities Are Located', p. 148						
GRI 413: Local Communities 2016	413-1 Operations with local community engagement, impact assessments, and development programmes	JSC Atomenergoprom and its organisations have no separate arrangements with their regions of operation. Local community engagement forms part of ROSATOM's stakeholder engagement.						

GRI 2-7 APPENDIX 3.

Number of employees of JSC Atomenergoprom with a breakdown by type of employment and region (as at 31 December 2022)⁸⁹

Indicator	Nu em
Altai Territory	
Amur Region	
Arkhangelsk Region	
Astrakhan Region	
Belgorod Region	
Vladimir Region	
Volgograd Region	
Voronezh Region	9
Moscow	3
Saint Petersburg	8
Zabaykalsky Territory	
Ivanovo Region	
Irkutsk Region	
Kaliningrad Region	
Kaluga Region	
Kirov Region	
Krasnodar Territory	
Krasnoyarsk Territory	4
Kurgan Region	
Kursk Region	
Leningrad Region	
Lipetsk Region	
Moscow Region	1
Murmansk Region	:
Nizhny Novgorod Region	
Novosibirsk Region	:
Omsk Region	
Orenburg Region	
Oryol Region	

89. The Company has no non-guaranteed hours employees.

Number of employees	Number of permanent employees	Number of temporary employees*	Number of full-time employees	Number of part-time employees
52	52	0	52	0
61	60	1	61	0
15	15	0	15	0
33	32	1	30	3
1,881	1,880	1	1,873	8
1,235	1,219	16	1,182	53
80	80	0	76	4
9,477	9,089	388	9,292	185
31,887	30,351	1,536	30,451	1,436
8,512	8,347	165	8,346	166
6,846	6,577	269	6,791	55
14	14	0	14	0
1,439	1,382	57	1,428	11
370	346	24	369	1
138	137	1	135	3
37	34	3	37	0
2,071	2,053	18	2,061	10
4,208	4,104	104	4,015	193
739	567	172	730	9
9,392	8,528	864	9,337	55
8,704	8,586	118	8,531	173
2,146	2,036	110	2,145	1
10,198	9,917	281	9,945	253
3,862	3,697	165	3,821	41
7,836	7,353	483	7,568	268
2,573	2,480	93	2,534	39
291	221	70	291	0
29	29	0	29	0
647	647	0	647	0

Indicator	Number of employees	Number of permanent employees	Number of temporary employees*	Number of full-time employees	Number of part-time employees
Penza Region	178	177	1	177	1
Perm Territory	75	68	7	72	3
Primorsky Territory	1,206	1,078	128	1,190	16
Republic of Bashkortostan	98	92	6	97	1
Republic of Buryatia	687	499	188	677	10
Republic of Karelia	1,363	1,305	58	1,300	63
Republic of Mordovia	178	175	3	172	6
Sakha Republic	103	103	0	103	0
Republic of North Ossetia – Alania	14	6	8	8	6
Republic of Tatarstan	590	584	6	586	4
Republic of Khakassia	259	259	0	252	7
Rostov Region	8,991	8,726	265	8,703	288
Ryazan Region	220	220	0	220	0
Samara Region	80	76	4	78	2
Saratov Region	5,705	5,552	153	5,623	82
Sakhalin Region	591	590	1	591	0
Sverdlovsk Region	10,205	9,992	213	10,001	204
Smolensk Region	6,083	6,032	51	6,034	49
Stavropol Territory	83	81	2	83	0
Tambov Region	614	604	10	614	0
Tver Region	5,521	5,345	176	5,359	162
Tomsk Region	5,698	5,173	525	5,610	88
Tula Region	778	778	0	778	0
Tyumen Region	27	26	1	27	0
Udmurt Republic	5,119	4,962	157	5,034	85
Ulyanovsk Region	552	500	52	533	19
Khabarovsk Territory	125	123	2	125	0
Khanty-Mansi Autonomous District	11	11	0	11	0
Chelyabinsk Region	1,956	1,916	40	1,875	81
Chukotka Autonomous District	1,196	1,172	24	1,186	10
Yaroslavl Region	245	244	1	238	7
Other	29	27	2	28	1
Total	173,353	166,329	7,024	169,191	4,162

Number of employees in JSC Atomenergoprom's overseas branches and organisations with a breakdown by type of employment (as at 31 December 2022)⁹⁰

Indicator	Number of employees	Number of permanent employees	Number of temporary employees*	Number of non- guaranteed hours employees**	Number of full-time employees	Number of part-time employees
Turkey	3,664	3,636	28	0	3,662	2
Kazakhstan	1,298	1,294	4	0	1,298	0
Bangladesh	268	241	27	0	268	0
Hungary	247	243	4	0	241	6
Belarus	207	93	114	0	199	8
Czech Republic	193	193	0	0	193	0
Egypt	161	159	2	0	161	0
Germany	120	119	1	0	119	1
Other	215	141	74	0	209	6
Total	6,373	6,119	254	0	6,350	23

Number of employees with a breakdown by gender and type of employment (as at 31 December 2022), persons⁹¹

Indicator	Women	Men	Total
Number of employees	59,958	119,768	179,726
Number of permanent employees	56,780	115,668	172,448
Number of temporary employees	3,178	4,100	7,278
Number of non-guaranteed hours employees	0	0	0
Number of full-time employees	57,019	118,522	175,541
Number of part-time employees	2,939	1,246	4,185

90. Data on the personnel structure have been provided for JSC Atomenergoprom's host countries with the largest number of employees.

91. A significant increase in the headcount compared to 2021 was driven by the development of new businesses: PJSC Quadra – Power Generation (11,000 people), LLC MC Delo (8,500 people), expansion of the Digitisation Unit by 5,200 people, and expansion of TITAN2 IC in the Power Engineering Division to 6,900 people.

APPENDIX 4.

Summary consolidated financial statements based on consolidated financial statements for the year ended 31 December 2022 and the independent auditors' report



FEEDBACK FORM

Dear readers,

You have read the annual report of JSC Atomenergoprom, which is intended for a wide range of stakeholders. We attach great importance to the opinion of the readers of our Report. We would appreciate it if you helped improve the quality of the Company's reports by completing the questionnaire below.

Please return the completed form by mail to the Communications Department or to the Treasury Department at 24 Bolshaya Ordynka Street, Moscow, 119017 or by email (EAMamy@rosatom.ru).



1. Please assess the Report using the following criteria:

actory	Poor
f information actory	Poor
ence, wording actory	Poor

2. Please specify which sections of the Report you have found to be relevant and useful:

3. What topics do you think should be covered in the next Report?

5. Please specify which stakeholder group you represent: Employee of JSC Atomenergoprom Representative of a customer/consumer of or ROSATOM goods and services

4. Your recommendations and additional comments:

Employee of an organisation forming part of JSC Atomenergoprom or ROSATOM Representative of a business partner Representative of a non-governmental Representative of the federal government organisation Representative of a regional government Representative of the media Representative of a local government Representative of the expert community

Representative of a contractor/supplier

Other (please specify)

GRI 2-3 Contact Details

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