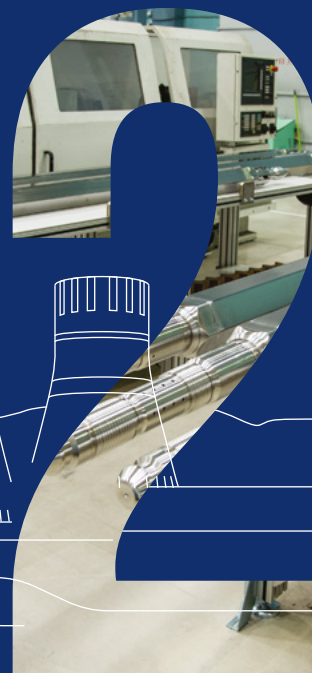
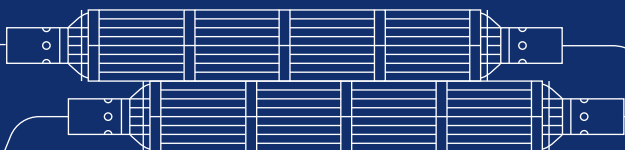




TVEL
ROSATOM



PERFORMANCE
OF THE FUEL DIVISION

2022

PERFORMANCE OF THE FUEL DIVISION

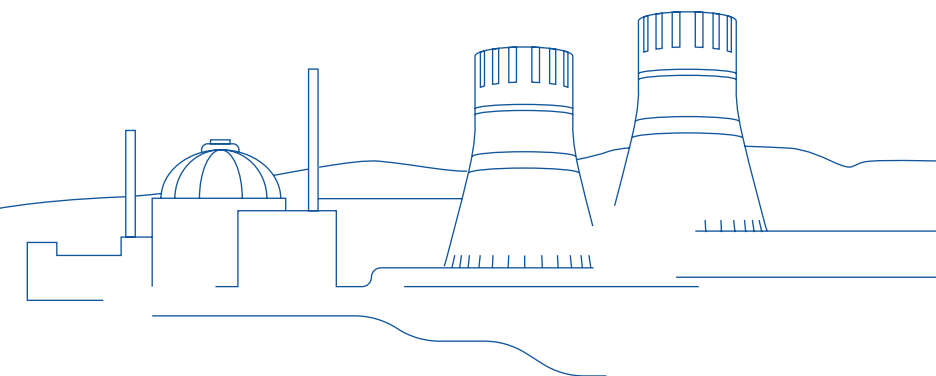
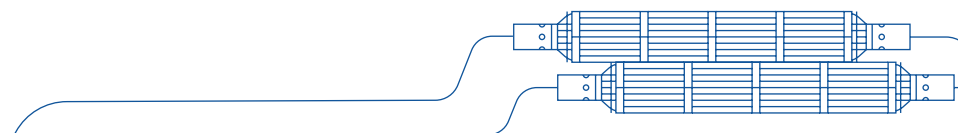
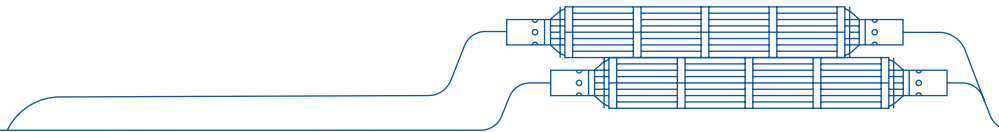


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GRI 2-22 MESSAGE FROM THE HEAD OF THE DIVISION

Dear colleagues, friends and partners,

In 2022, despite new global challenges, ROSATOM's Fuel Division fully implemented all of its contractual obligations. The consolidated revenue of the Division increased by nearly 15% to RUB 271 billion. Revenue growth was mainly driven by an increase in orders for our core fuel products. Our sales functions promptly adapted our foreign trade infrastructure to the new challenging conditions, including the creation of new logistics chains, while production facilities successfully coped with the increased workload.

We are successfully implementing international engineering projects, which strengthen ROSATOM's technological leadership in the nuclear fuel cycle. Fuel for start-up core loading and for the first reloading of CFR-600, the first high-power fast neutron reactor in China, was manufactured and shipped to the customer. Earlier, the Machine-Building Plant in Elektrostal (MSZ JSC) had successfully launched the production of fuel designed for the Chinese reactor. In India, a project was implemented to introduce advanced

VVER-1000 nuclear fuel at Unit 1 of Kudankulam NPP and extend its fuel cycle to 18 months.

The development of new non-nuclear businesses by the Fuel Division makes a significant contribution to the technological sovereignty of the Russian production sector, where whole new industries are being created. The construction of a lithium-ion battery factory was launched in the Kaliningrad Region. The first Russian 'gigafactory' with a capacity of 4 GWh per year will meet the demand of Russian electric vehicle producers for traction batteries; it will also supply stationary energy storage systems for the power grid. ROSATOM's second Additive Manufacturing Centre was opened in Novouralsk. In addition, SKD assembly of telecommunications equipment essential for import substitution was launched at the Moscow Polymetals Plant.

Continued efforts to eliminate nuclear legacy will have a comprehensive effect on environmental, social, economic and technological aspects.



INCREASE OF THE CONSOLIDATED REVENUE OF THE DIVISION

Following the appointment of TVEL JSC as the CIS base organisation for the decommissioning of nuclear facilities, we have been successfully developing this line of business on the international level. In 2022, an agreement was signed for the reclamation of uranium factory dumps and tailings at Taboshar in Tajikistan.

In 2023, the Fuel Division will continue to implement all of its strategic research, engineering, and production projects. The assembly of an innovative BREST-OD-300 reactor will begin at the Pilot and Demonstration Energy Facility in Seversk. The first cycle of pilot operation of accident tolerant fuel (ATF) meeting new-generation safety standards and the uranium/plutonium REMIX fuel for VVER reactors will be completed at Rostov NPP and Balakovo NPP respectively. Large-scale efforts will be focused on non-nuclear businesses, including the development of metals production at the Chelyabinsk Mechanical Plant (CMP JSC); implementation of projects to introduce new

special chemical products; development of a new line of equipment for hydrogen production; opening of new sites for the assembly of energy storage devices, etc.

The medium-term and long-term priorities of the Fuel Division are determined by the strategy of TVEL JSC and related to improving our competitiveness in the global market, diversifying our business by product and geography, and implementing sustainable development principles both in production and the social policy in the regions of operation.



Natalya Nikipelova
President of TVEL JSC, Head of the Fuel Division



1

**KEY RESULTS AND EVENTS IN THE
REPORTING YEAR**

2

OVERVIEW OF THE DIVISION

RUB 271 BILLION
CONSOLIDATED REVENUE

KEY RESULTS AND EVENTS IN THE REPORTING YEAR

Key results in 2022

Indicator	2020	2021	2022
Consolidated revenue, RUB million	208,736.7	235,734.6	271,001.1
LTIFR	0.02	0.05	0.09
Revenue from the sale of non-nuclear products, RUB million	24,221.5	26,187.1	30,777.3
Revenue from new products, RUB million	19,301.9	22,664.1	27,918.6
Environmental costs, RUB million	1,989.1	2,345.8	2,366.8
Average headcount, persons	21,946	21,958	23,382
Tax payments (actual), RUB million	15,961	15,072	16,116

Key events in 2022

- 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.
- An engineering project to introduce more advanced nuclear fuel, TVS-2M, was implemented at power unit No. 1 of Kudankulam NPP (VVER-1000).
- The delivery of vessel components for the innovative BREST-OD-300 reactor to the power unit construction site was started: the support plate for the unique reactor was delivered to Seversk.
- The programme of reactor tests for new materials for accident tolerant fuel (ATF) 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.
- A contract was signed for the supply of modified nuclear fuel for a VVR-SM research reactor operated at the Institute of Nuclear Physics of the Uzbekistan Academy of Sciences.
- The construction of a lithium-ion battery factory was started in the Kaliningrad Region. The first Russian ‘gigafactory’ with a capacity of 4 GWh per year will meet the demand of Russian electric vehicle producers for lithium-ion traction batteries; it will also supply stationary energy storage systems for the power grid.
- A contract was signed with BKM Holding, a leading Belarusian manufacturer of ground urban electric transport, to supply lithium-ion batteries for 97 trolleybuses with an extended off-wire range of up to 20 kilometres. The trolleybuses are manufactured for St. Petersburg; and the first of them have already appeared on the city’s routes.
- ROSATOM’s second Additive Manufacturing Centre was opened in Novouralsk.
- LLC T-COM launched a workshop for the SKD assembly of telecommunications equipment at the site of the Moscow Polymetal Plant. 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.
- A contract was signed for the development of documentation and implementation of a reclamation project at uranium factory dumps and tailings at the Taboshar production site in Tajikistan. This is the first contract for the reclamation of uranium tailings in the CIS for ROSATOM.
- A major nuclear legacy elimination project was completed in Moscow: a building with the U-5 nuclear unit was decommissioned.
- The unique and complicated project was implemented in a densely populated Schukino district in Moscow, while the research institute functioned as usual.

2 | OVERVIEW OF THE DIVISION

GRI 2-1 TVEL Fuel Company (hereinafter referred to as TVEL Fuel Company or the Division) is one of the world's largest nuclear fuel producers and the monopoly supplier of nuclear fuel for Russian NPPs, naval propulsion and research reactors in Russia.

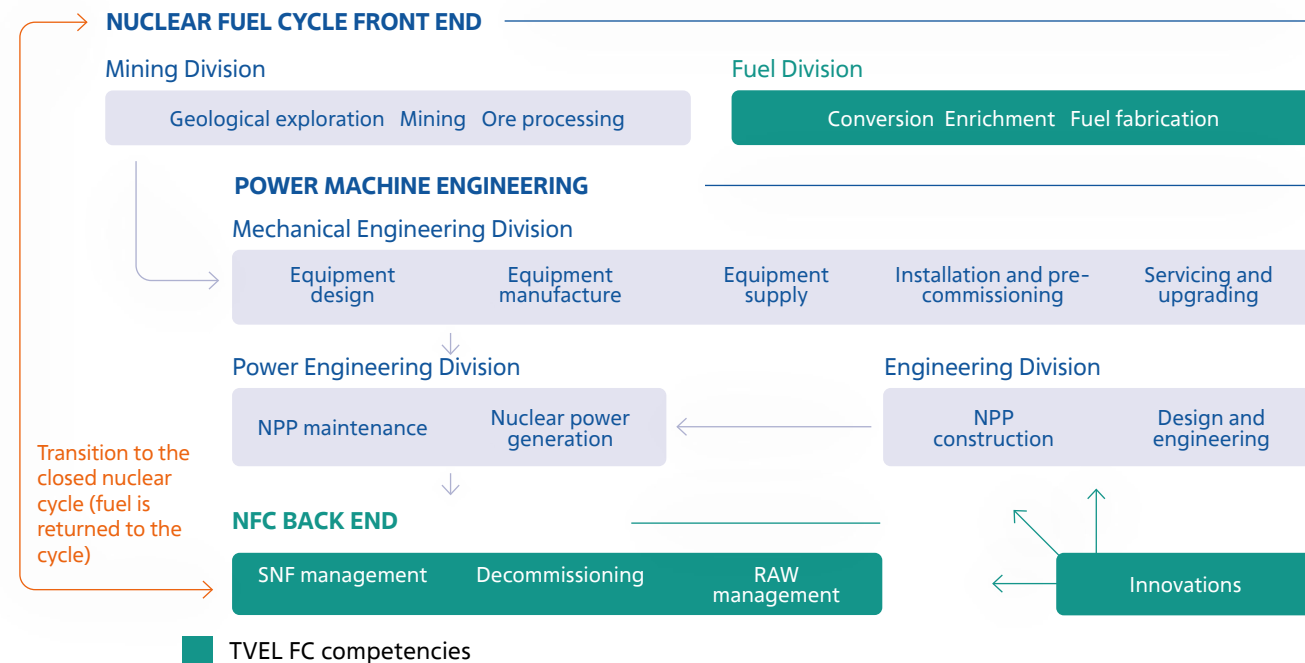
TVEL JSC provides nuclear fuel to 73 power reactors in Russia and abroad. Fuel produced by the Division is used at NPPs in 15 countries, meaning that one in every six power reactors worldwide runs on this fuel.

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, as well as in

additive manufacturing and energy storage systems. The Division is the world's largest producer of enriched uranium and stable isotopes.

Role of the Division in the structure of the nuclear industry

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



Key business areas

The core business of TVEL JSC is mainly focused on the global market. The Company is the main supplier of fuel for Russian-design VVER reactors abroad and has the necessary capabilities for the fabrication of nuclear fuel for PWR and BWR reactors and its components from reprocessed uranium (in cooperation with Framatome), as well as fuel pellets for BWR and PHWR reactors. TVEL Fuel Company has developed its own in-house design of fuel assemblies for PWR reactors and markets it as TVS-Kvadrat fuel. The Division has globally unparalleled 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 for the future innovative BREST-OD-300 reactor, are currently being tested in the BN-600 reactor.

All stages of its operations strictly comply with nuclear and radiation safety, industrial, fire and environmental safety requirements, and the requirements for occupational health and safety, physical protection of nuclear facilities and nuclear materials, and emergency preparedness.

The Fuel Division's enterprises also fabricate nuclear fuel and its components for research reactors of Russian and foreign design around the world.

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

The R&D activities of TVEL Fuel Company comprise a wide range of areas, from improving nuclear fuel designs and materials, closing the nuclear fuel cycle, and developing innovative types of fuel to solving a number of scientific applications tasks.

Responsibility for the Division's products at all stages of their life cycle

According to the Quality Manual of the Fuel Division (paragraph 9.4 of RKK-1-2022), the supplier shall organise the monitoring and measurement of product characteristics (product control) by manufacturers to ensure that the quality of products meets applicable requirements.

The procedures for managing the monitoring and measurement of products are defined in the quality manuals of the manufacturers.

The scope, sequence and methods of product control during the production process and the controlled parameters are determined by supply contracts.

No products shall be shipped or transferred for further use unless product acceptance, including acceptance by a customer and/or a customer representative (if specified in the supply contract), has been satisfactorily completed and documented.

Certificates issued to confirm that the products meet the acceptance criteria shall specify the persons who authorised the release of products.

Regions of operation

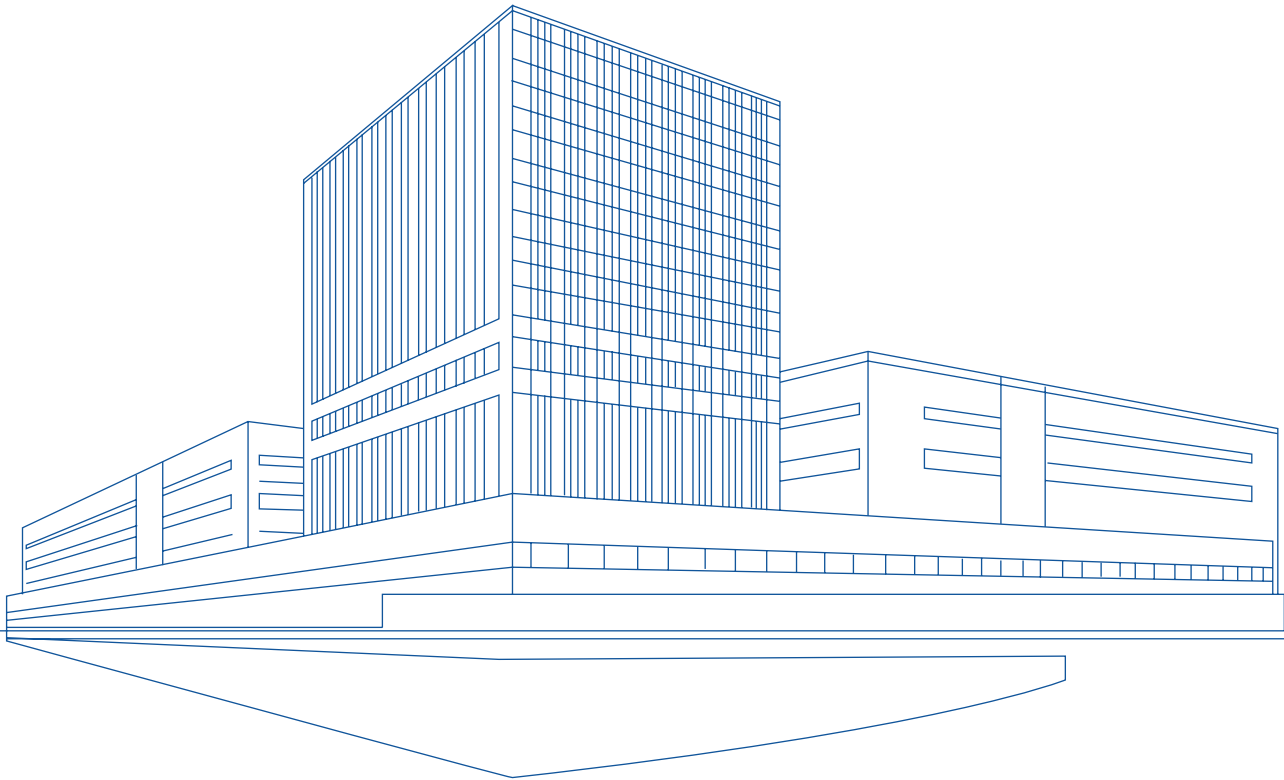
The Company is present in 10 regions of the Russian Federation. The Division’s production facilities are based in closed administrative and territorial formations (CATFs), such as Seversk, Novouralsk and Zelenogorsk, and in the single-industry town of Glazov. These enterprises play a central role in the local economy and are major taxpayers.

When the new battery plant in Neman is commissioned, the Kaliningrad Region will become a new region of presence for the Fuel Division.

Geographical footprint of the Division



Region	Entities
1. Moscow	TVEL, VNIINM, Moscow Polymetal Plant, Central Design and Technological Institute
2. Moscow Region	MSZ JSC (Elektrostal)
3. Saint Petersburg	Centrotech-Engineering LLC
4. Vladimir Region	Tochmash (Vladimir), KMP (Kovrov)
5. Udmurt Republic	Chepetsk Mechanical Plant (Glazov)
6. Sverdlovsk Region	UEIP, Centrotech (Novouralsk)
7. Novosibirsk Region	NCCP (Novosibirsk)
8. Tomsk Region	SCP (Seversk)
9. Krasnoyarsk Territory	ECP (Zelenogorsk)
10. Irkutsk Region	AECP (Angarsk)





3

GOVERNANCE SYSTEM

4

INNOVATION AND DEVELOPMENT
OF SCIENCE

RUB 27.9 BILLION
REVENUE OF NEW PRODUCTS

‘Gigafactory’ for manufacturing lithium-ion
batteries (cells) layout



3 | GOVERNANCE SYSTEM

GRI 2-1 The Division builds its corporate governance system in accordance with Russian and global best practices and standards and on the basis of applicable Russian legislation regulating the operations of a joint-stock company and its governing bodies, as well as ROSATOM’s universal industry-wide methodological guidelines and related internal corporate governance regulations.

GRI 2-9 Corporate governance principles. Governing bodies

TVEL JSC applies certain provisions of the Corporate Governance Code recommended in Letter No. 06-52/2463 of the Bank of Russia dated 10 April 2014, with due regard to the special characteristics of ROSATOM’s legal status stipulated in laws and regulations of the Russian Federation that ensure consistent management of organisations in the nuclear industry. These provisions are incorporated in a number of local regulations of the Company.

In accordance with the Articles of Association, governing bodies of TVEL JSC include the following:

- The General Meeting of Shareholders (represented by the sole shareholder);
- The Board of Directors;
- The President (the sole executive body).

Decisions on issues within the competence of the General Meeting of Shareholders are taken by the sole shareholder of the Company, Atomenergoprom JSC.

GRI 2-10 The Board of Directors plays a key role in the strategic management of TVEL JSC and the entire Fuel Division. Members of the Board of Directors are nominated by Atomenergoprom JSC as the sole shareholder, based on the qualification and competencies to address the tasks set.

GRI 2-17 The Board of Directors mainly consists of external directors not employed by the Company. The directors are professionals with extensive experience in the industry and a deep insight into the specific nature of the Company’s operations.

As per the Sole Shareholder’s Resolution No. 58 dated 28 June 2022, seven members were elected to the Board of Directors.

There are no independent directors (within the meaning of the Corporate Governance Code recommended by the Bank of Russia) on the Board of Directors of TVEL JSC.

In the reporting period, the Board of Directors of TVEL JSC consisted of five men and two women.

In accordance with the Articles of Association and the Sole Shareholder’s Resolution No. 56 dated 17 September 2021, as well as the contract signed with the Company, Natalia Nikipelova, President of TVEL JSC, performs the functions of the sole executive body.

In 2022, 12 meetings of the Board of Directors were held. The Board adopted resolutions on the most important business issues for TVEL JSC:

- Approved the budget and financial and business targets for TVEL JSC;
- Approved amendments to the Regulations on Procurement;

- Approved recommendations for the Single Shareholder on the allocation of net profit for 2021 and on the election of a new Board of Directors of TVEL JSC;
- Approved the Annual Report and the annual financial statements;
- Made a decision on the appointment of auditors.

In 2022, all of the Board meetings were held by correspondence.

Ownership structure

All of the shares in TVEL JSC have been contributed to the capital of Joint-Stock Company Atomic Energy Power Corporation (“Atomenergoprom”) ROSATOM owns 100% of voting (ordinary) shares in Atomenergoprom JSC.



Improvement of the corporate governance system

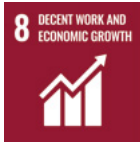
The corporate governance system is being improved in accordance with the strategic goals and objectives of ROSATOM, subject to the specific nature of the Division’s business.

Commitment to sustainable development principles

GRI 2-22 TVEL JSC shares ROSATOM’s commitment to the sustainable development agenda and its focus on environmental, social and governance aspects of its operations.

The UN Sustainable Development Goals (SDGs), the achievement of which is directly influenced by the production, operational, investment, and R&D activities of TVEL Fuel Company are discussed in the table below.

UN SDGs	The Division’s contribution to the achievement of the UN SDGs
	<p>Stable isotopes produced by TVEL JSC are widely used in medicine. Its titanium and zirconium products are supplied to manufacturers of medical equipment and surgical implants. In 2022, the first batch of bioceramic dental implants was delivered to register the new medical product and bring it to the Russian market, and serial batches of medical titanium bars and wire were shipped to key domestic manufacturers of medical implantable products. The bars were used to produce implants for osteosynthesis, maxillofacial surgery and products for the arthroplasty of large human joints.</p> <p>Stable isotopes produced by TVEL are also used in fundamental research. Double beta-ray decay of zirconium-96 is the rarest of radioactive decay processes. In 2022, PA ECP was the first in the world to produce and deliver unique samples of zirconium-96 isotope (Zr-96) to the Joint Institute for Nuclear Research (JINR, Dubna, Moscow Region) for international research in physics, cosmology and astrophysics.</p>
	<p>The Company’s fuel is used to generate ~400 billion kWh of clean low-carbon energy per year. TVEL JSC also manufactures components for wind turbines. The Company’s energy storage systems represent an end-to-end technology for the development of a new generation of energy systems, including renewable energy projects, smart grids, and energy efficiency solutions.</p>



The enterprises of the Division are the principal employers in their host towns and cities and major taxpayers in their regions. The production operations of the Fuel Division create an extensive network of suppliers and numerous jobs across the supply chain.

An active development of new businesses and product lines also generates employment.

In 2022, the average monthly salary in the Division increased by 12% year on year to RUB 104,171.

The Company continues its comprehensive work with the potential and existing residents of PSEDAs in its host towns and cities (Seversk CATF, Novouralsk CATF, and Glazov). Since the formation of PSEDAs by the Fuel Division, a total of 62 resident companies have been registered therein, 64 agreements have been signed, 1,880 new jobs have been created and RUB 3,634.6 billion of investments have been attracted.



The Division annually invests ~RUB 7 billion into financing nuclear and non-nuclear R&D projects. The Division participates in major international megascience projects by supplying stable isotopes with very high chemical purity and superconducting materials. In the context of developing new non-nuclear businesses, TVEL JSC has created a number of new industries in Russia, such as additive manufacturing and energy storage technologies.

In November 2022, for example, field tests of a process of cutting up real gaseous diffusion equipment using a mobile laser complex were carried out at the production site of AECF JSC.

See Chapter 6 'Innovation and Development of Science' for details.



The Division is actively developing technologies for the recycling of nuclear materials,

in particular, for the fabrication of new types of uranium-plutonium fuel based on recycled products of the nuclear fuel cycle.

Fuel for fast neutron reactors, namely, oxide-based MOX fuel and nitride-based MNUP fuel, is fabricated by mixing plutonium from used thermal reactor fuel with depleted uranium. Industrial DUHF reconversion technologies enable the conversion of uranium hexafluoride into oxide and its re-introduction into the fuel cycle. Fluorine-containing products obtained as a result of DUHF de-fluorination, such as hydrofluoric acid and anhydrous hydrogen fluoride, are marketed as commercial chemical products.

Other solutions include fuel for thermal neutron reactors based on regenerated uranium and REMIX fuel for VVER reactors fabricated from unseparated mixture of uranium and plutonium.

In 2022, NCCP JSC launched into operation a line for integrated processing of production waste containing radionuclides. The project implemented at NCCP made it possible to fully eliminate the discharge of industrial wastewater to the tailings dump and minimise the amount of waste generated at the plant.

In the reporting year, AECF JSC (Irkutsk Region) commissioned an innovative Fremes system for sorting bulk materials. The system is expected to reduce the volume of radioactive waste for final disposal by 80%.

A programme to develop technologies and infrastructure for the management of SNF-contaminated waste is implemented in cooperation with Beloyarsk NPP, the Pilot and Demonstration Engineering Centre for the Decommissioning of RBMK Reactors and a number of nuclear organisations, with 25 initiatives scheduled for 2022–2028.

A comprehensive programme for the management of minor actinides until 2030, with detailed cost estimates for 2022–2024, is being implemented.

See Chapter 6 'Innovation and Development of Science' for details.



TVEL JSC is actively developing the production of energy storage systems, a key technology for the development of environmentally friendly electric vehicles. Moreover, TVEL JSC is a leading Russian manufacturer of automotive and motorcycle engine catalysts, which reduce emissions of harmful substances into the atmosphere.

The Company is also developing a line of products for hydrogen energy.



TVEL Fuel Company is an industry integrator of the Russian nuclear industry for decommissioning of nuclear and radiation hazardous facilities.

On request of TVEL JSC, a unique technology of NPP equipment decontamination has been developed for decommissioning projects. The technology has no precedents in the Russian nuclear industry. An experimental test bench was created to test a decontamination technology based on the use of high concentration ozone, and a transportable unit was made for decontaminating NPP pipe equipment

In 2022, a contract was signed for the development of documentation and implementation of a reclamation project at uranium factory dumps and tailings at the Taboshar production site in Tajikistan. This is the first such contract in the CIS for ROSATOM. Also, in 2022, the Chepetsk Mechanical Plant (CMP JSC) completed a project to expand its monitoring network for on-site subsoil condition monitoring (OSCM) by increasing the number of stations monitoring the radiation and chemical parameters of subsoil condition at 25 wells of the main production site.

See section 'Key Events in 2022' in Chapter 1. 'Key Results and Events in the Reporting Year' for details..

The main objective of the environmental protection activities of TVEL JSC is to ensure environmental, nuclear and radiation safety. The Company is a leader in the implementation of automated energy accounting systems and a methodology for improving energy efficiency in the nuclear industry.

See Chapter 6. 'Safety of Operations' for details of the Company's practices and activities in this field.

One of the best practices is the exchange of in-house experience in energy efficiency improvement in the course of internal audits of energy management systems carried out to check compliance with ISO 50001, by means of annual rotation of working group members delegated by the Division's enterprises.

The Company has developed a number of strategic initiatives and special projects focused on the social and economic development of regions/territories of operation and maintaining social stability therein. This activity includes, in particular, urban improvement projects, organisation of socially important events, and charity projects and generally improves social welfare in the regions of operation.

See Chapter 9 'Developing the Regions of Operation' for details of implemented social projects..

The Company adheres to the Unified Industry Policy on Sustainable Development. Its key objectives are implemented as part of the operational activities of JSC TVEL and its subsidiaries in the field of environmental protection, occupational health and safety, energy saving and energy efficiency, anti-corruption, and the implementation of projects and initiatives aimed at social support and development of the host towns and cities of TVEL Fuel Company.

TVEL JSC has adopted the Uniform Industry-Wide Guidelines on the Management of Sustainability Initiatives, the Code of Ethics and Professional Conduct for Employees of ROSATOM, and ROSATOM's uniform industry-wide policies on occupational health and safety, safety culture, environmental protection, social policy, human rights, anti-corruption, and public reporting.

Also, the Company adopted a Sustainable Development Plan for 2022.

A sustainable development officer on the Division level is appointed in accordance with the minutes of JVEL JSC meeting on the Functional Strategy of the Block for Regional and Social Projects on Social Development (Minutes No. 4-01.2/100-pr of 17 March 2021). The Minutes also specify the tasks of the Project Office, namely, to introduce sustainable development practices in accordance with ROSATOM's uniform industry-wide guidelines on sustainable development.

Following the industry-wide internal product sustainability certification in the category of energy storage systems based on electrochemical cells, metal products (titanium, calcium wire, conductors) and TVS-Kvadrat fuel passed the internal sustainability certification and were included in ROSATOM's Order No. 1/1784-P of 27 December 2022. There are plans to carry on sustainability certification in other business areas with subsequent implementation of plans and actions aimed at improving product sustainability.

In 2022, the Division, as part of ROSATOM, participated in the ESG rating by the Analytical Credit Rating Agency (ACRA). ACRA rated ROSATOM at ESG-3 and assigned it to the ESG-B category on environmental, social and governance score. Enterprises of the Fuel Division were highly efficient in reducing waste generation and harmful emissions: these factors of negative environmental impact remain consistently low compared to peer companies.

The Company successfully operates a system of sustainable development training for employees. Employees have access to free training offered to all nuclear industry workers, including the Fuel Division. Online training courses are available in the RECORD Mobile application (12,490 person-courses, 7,699 unique employees trained in 2022). The Company's employees also participated in sustainable development training at workshops and webinars on Sustainable Environment in ROSATOM, in particular, a workshop on human rights protection in ROSATOM arranged by TVEL JSC (500 person courses in 2022).

GRI 2-29 Stakeholder engagement

TVEL Fuel Company is committed to the principle of openness: it engages with stakeholders on an ongoing basis and systematises, analyses and takes into account their requests. This approach allows the Division to promptly react to potential risks, mainly social and reputational, related to stakeholder engagement.

The system of engaging each of the stakeholder groups has and will have a material impact on the Company's business; therefore, the recognition of stakeholder interests in the process of planning across multiple horizons and in day-to-day operations is a critical sustainable development factor.

The Fuel Company interacts with various stakeholders, including consumers, population in the regions of operation, suppliers and contractors, scientific community, educational institutions, non-governmental organisations, rating agencies, expert community, shareholders, senior executives of ROSATOM's subsidiaries and divisions, employees, government authorities (in particular, regulatory and supervision bodies), local administrations, and mass media. Engagement formats vary depending on specific stakeholder requirements.

Anti-corruption

Preventing corruption is one of the Division's most important business principles. The Division is guided by the industry-wide anti-corruption policy of ROSATOM. The Division has zero tolerance for corruption offences, such as abuse of office, giving a bribe, accepting a bribe, abuse of authority, commercial bribery or other illegal use of one's official position contrary to the legitimate interests of the company and the state in order to obtain benefits.

In order to combat corruption and implement Decree No. 478 of the President of the Russian Federation on the National Anti-Corruption Plan for 2021-2024 dated 16 August 2021, the Company has implemented policies and procedures aimed at avoiding and preventing corruption offences, identifying and eliminating the causes of corruption, and disclosing and investigating such offences. In its fight against corruption, the Company has been working to identify and eradicate the causes of offences and minimise and eliminate their consequences.

GRI 2-25 The Division operates a multi-channel hotline. In addition, employees register for and participate in a full-time Corporate Anti-Corruption Policy training programme on a quarterly basis.

Quality Management System

TVEL JSC has implemented and successfully operates an Integrated Management System (IMS), which covers all enterprises controlled by the Division's and includes corporate systems for quality management, environmental management, occupational health and safety management, energy management, and supply chain security management.

Standards have been developed and implemented to ensure efficient functioning of the IMS in accordance with the international standards ISO 9001:2015, ISO 19443:2018, ISO 14001:2015, ISO 45001:2007/2018, ISO 50001:20181, ISO 28000:2007; the requirements of the IAEA, and customer requirements. The system has received an international certificate of compliance.

The main strategic goal of the Company in this area is the constant improvement of product quality and operational safety aimed at maximum satisfaction of customer requirements, expanding the Company's markets and supporting the sustainable development of its subsidiaries. To achieve this goal, a comprehensive set of measures and documented procedures has been developed and implemented to enable efficient functioning of the IMS quality management system; feedback is solicited from product users to further develop and improve the operations of TVEL Fuel Company; and customer satisfaction surveys are conducted on an annual basis.



4

INNOVATION AND DEVELOPMENT OF SCIENCE

The R&D activities of the Division comprise a wide range of areas, from improving nuclear fuel designs and materials, closing the nuclear fuel cycle, and developing innovative types of fuel to solving a number of scientific applications tasks. The Division’s enterprises rely on advanced technological solutions to produce reliable fuel with improved characteristics for the existing and new reactor types.

Innovation activity in the nuclear industry is a key prerequisite for long-term business competitiveness and sustainability of the Division, since nuclear fuel cycle front-end services and products represent the core business of its enterprises.

The Division has the following **key areas of innovation activity** focused on attaining ROSATOM’s strategic goals of expanding its share of the international market and developing new products, in particular, the development of nuclear fuel for:

- A two-component nuclear energy system with a closed nuclear fuel cycle;
- Uranium nuclear fuel and nuclear cores of Russian-design power reactors (primarily VVER-1000/1200/1300);
- Western-design reactors (PWR);
- Accident tolerant fuel for VVER and PWR reactors based on advanced technologies;
- Small NPPs, research reactors and nuclear icebreakers.

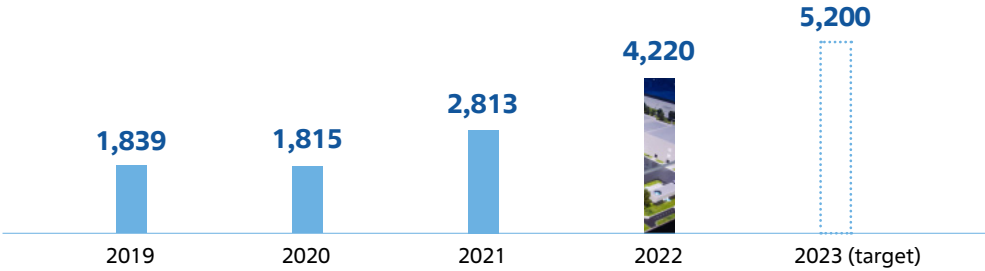
Work on NPP power units that are currently in operation or under construction is focused on the achievement of the following objectives:

- Higher fuel burnup;
- Longer service life of NFAs;
- More reliable nuclear fuel;
- Validation of NFA performance during NPP operation at increased capacity (up to 107% of rated capacity for VVER-1000) in strict compliance with safety requirements.

Cooperation between research institutes, design bureaus and production enterprises facilitates the development of sophisticated technological solutions. They include new gas centrifuge types, optimisation of TVS-K fuel design, new types of fuel for small nuclear power plants (SNPP) and research reactors and new cores for nuclear icebreakers.

Projects to optimise the design of TVS-K fuel and develop new types of fuel for SNPP and research reactors facilitate the implementation of plans to develop international business and enter new markets.

Investments in R&D, RUB million



Nuclear fuel for thermal neutron reactors

New fuel development and engineering services

Development of nuclear fuel projects

The Division completed acceptance testing of:

- TVS-2M fuel assembly for Kudankulam NPP;
- dummy NFAs and CPS absorber rods for Akkuyu NPP;
- fuel cassettes with an optimised water-uranium ratio for Loviisa NPP;
- RK 3+ fuel cassettes for Dukovany NPP;
- fuel cassettes and NFAs with fuel made of RS-E feed for Bohunice NPP and Mochovce NPP;

Development of TVS-5 fuel assemblies for the Balanced NFC product area

- The design of 5th generation NFAs (TVS-5) was developed, a full-scale mock-up fuel assembly was manufactured and tested on a test bench in close-to-operation conditions.
- Documentation was prepared for the TVS-5 technical project.
- Decision on conducting reactor tests of the first three TVS-5 fuel assemblies with uranium fuel starting from 2023 was approved.

R&D project to validate the reliability of nuclear fuel for high power reactors operated in the load following mode

- The MANEVR-1 load following experiment in the MIR research reactor was completed.

Licensing of nuclear fuel designs by supervisory bodies

- TVS-2M VVER-1000 was licensed by an Indian supervisory authority and loaded into Unit 1 reactor at Kudankulam NPP.
- TVS-2006 VVER-1200 was licensed in Hungary for use at Paks-2 NPP.
- TVS-2006 VVER-1200 was licensed in Egypt for use at El Dabaa NPP.

Accident-tolerant fuel (ATF)

- As part of the project to develop accident tolerant fuel based on U_3Si_2 for VVER reactors, research and tests were completed and a technological process was developed for experiments with a production technology for manufacturing U_3Si_2 powder from UF_6 through multiple-stage conversion.
- Technical documentation was developed for licensing pilot operation of combined TVS-2M with ATF assemblies in the reactor core of power unit No. 2 at Rostov NPP during the 11th fuel campaign.

Moving Towards Zero Fuel Failure Project

In 2022, TVEL JSC developed and fully implemented an action plan under the Moving Towards Zero Fuel Failure Project, covering the launch, manufacturing and operation of products. Key measures implemented as part of the plan included the following:

- The composition of the working group responsible for correcting design, technical and operating documentation on nuclear fuel for NPPs with VVER reactors was updated.
- Failure Mode and Effect Analysis (FMEA) of methods used for the analysis of risks and consequences of failures in the process of nuclear fuel production at NCPP PJSC and MSZ JSC was completed.
- Peer reviews of nuclear fuel and TVSA-PLUS component production at MSZ JSC and nuclear fuel and TVS-2M production at NCPP PJSC were conducted.
- Work is in progress on compiling an Atlas on Standard Condition of Components Used in Fresh NFAs and CPS absorber rods for VVER.
- Tests of equipment for removing foreign bodies from the NFA cap, the CPS absorber rod support, and the space between fuel assemblies were completed at power unit No. 3 of Kalinin NPP.

Fuel for fast neutron reactors and closed NFC

Development of fuel for fast neutron reactors

For Russian reactors:

- Decision on replacing the material of plugs used in control rods for active and passive safety systems in BN-800 reactors with EK164-ID steel was developed and approved by JSC Rosenergoatom.

For the Chinese CFR-600 reactor:

- Pilot batches of fuel elements, NFAs, sleeves, rods, CPS and PSS absorber elements were manufactured and tested at MSZ JSC.

Development of uranium-plutonium fuel

MOX fuel

- Decision on developing, producing, testing in the BN-800 reactor core and post-reactor studies of NFAs with fuel elements containing MOX fuel with minority actinides was developed and approved by ROSATOM.
- Four NFAs for the BN-800 reactor with MOX fuel and EK164 steel cladding of fuel elements were fabricated and passed acceptance testing at FSUE Mining and Chemical Plant. Switching to a new steel grade will improve fuel utilisation efficiency in the long term.

MNUP fuel:

ROSATOM has approved the following projects:

- To launch and manufacture the core products and components for the actual and simulation reactor cores of the BREST-OD-300 reactor unit;
- To develop, manufacture and use experimental ETVS-26, -27, -28 fuel assemblies with BN-1200 fuel elements and MNUP fuel for operation in the core of the BN-600 reactor and post-reactor studies;
- To develop, manufacture and use irradiation assemblies with MNUP fuel for operation in the core of the BN-600 reactor and post-reactor studies;
- To develop, manufacture and use KETVS-25 combined experimental fuel assemblies with BN-1200 fuel elements containing mixed nitride uranium-plutonium fuel and improved cladding for pilot operation in the core of the BN-600 reactor and post-reactor studies;
- Irradiation fuel assemblies with MNUP fuel and ETVS-26,-27,-28 with MNUP fuel for testing in the BN-600 reactor were manufactured and passed acceptance tests at the Siberian Chemical Plant.
- MSZ JSC manufactured and completed acceptance tests of modernised control rods for active and passive safety systems of the BN-800 reactor and dummy inner and outer core fuel elements for dummy NFAs to be used in the dummy core of the BREST-OD-300 reactor.

Proryv (Breakthrough) Project Implementation

Proryv is a top-priority strategic project of ROSATOM and federal project No. 1 under the Comprehensive Programme for the Development of Equipment, Technologies and Scientific Research in the Field of Nuclear Energy Use in the Russian Federation for the Period up to 2024. Technologies developed under the Proryv project are expected to make Russia a global nuclear power leader.

In 2022, the most important milestone in the Proryv project was the delivery of the first shipment of metal structures for the reactor vessel of the BREST-OD-300 reactor unit, including a 160-tonne support plate shipped by water via the Northern Sea Route, the Ob River and the Tom River.

The commissioning and trial operation of the main process equipment began at the fabrication/prefabrication module (FRM). Equipment for the analytical laboratory was delivered.

As part of the project to develop design documentation for the construction of the SNF reprocessing module, a contract for engineering surveys was concluded.

A shielded inert glovebox, a prototype of radiation protected pyroprocessing equipment for SNF and RAW processing at the SNF processing module, was assembled and successfully tested at the Chemical and Metals Plant of SCP JSC. The glovebox section will be used for testing new inert-atmosphere equipment.

The construction of the training centre at the Pilot and Demonstration Energy Facility (PDEF) was completed. A protocol on the commissioning of the centre was signed. Agreements were concluded for the development and manufacture of analytical and full-scale simulators for the BREST-OD-300 power unit. Training of FRM operators at the ATOM analytical simulator will begin in 2023.

The construction of a test bench for acceptance testing of the main circulation pumps of the BREST-OD-300 reactor was completed. A protocol on the acceptance of the completed test bench was signed and the loading of lead into the furnaces commenced. The testing of a prototype pump will begin in 2023.

Technical specifications for connecting a power evacuation system to a power grid were received, engineering surveys and the development of design documentation were completed. A positive opinion was obtained from the ROSATOM Expert Review Board for the results of engineering surveys and design documentation.

Design documentation was developed for the construction of a workshop for the manufacture of large-size metal tubes at the Chepetsk Mechanical Plant. The documentation received a positive opinion of the state expert review panel. Construction of the workshop was launched in December 2022.

Development of nuclear fuel for small nuclear power plants (SNPPs)

Development of the reactor core for the ground-based SNPP project with a RITM-200N reactor was completed.

For floating SNPP projects:

- Development of the core for a modernised floating nuclear power unit (MFPU) with a RITM-200C reactor was completed under the programme to build MFPU to supply energy to Baimsky GOK mining project.
- As part of the industry programme to develop a family of floating power units with a full range of generation capacities for domestic and overseas markets, development of the RITM-400M reactor core for optimised Arctic-type Nuclear Floating Power Units was started.

Development of fuel for research reactors

- Technical specifications and design projects were developed, process technologies were tested and pilot NFAs were manufactured for a VVR-SM research reactor in the Institute of Nuclear Physics of the Uzbekistan Academy of Sciences.
- Technical specifications, design projects and addenda to certificates were developed and the testing of technologies was completed for the MARIA research reactor in the National Centre for Nuclear Research in Poland;
- Technical documentation and specifications were developed, the testing of technologies was completed, VVR-M2 NFA mock-ups were manufactured and trials were performed for the BRR-200 research reactor in the Centre for Nuclear Technology Research and Development in Bolivia.

Key R&D areas for non-nuclear businesses

Superconductivity:

Development of technology for manufacturing high-purity niobium sheets for superconducting resonators

- VNIINM JSC manufactured a batch of 50 niobium sheets with the residual resistivity ratio (RRR) >300 in accordance with a foreign customer's specifications.

Additive manufacturing

Project UITP-MT-98 to develop 3D equipment and technologies for using electron beam selective melting (EBSM) to print metal products with domestic electron-beam guns and scanning systems

- As part of the project, a wire-based electron-beam (EBAM) 3D printer was developed and manufactured, a technology for printing blanks of the MHD-pump outlet nozzle for reactors with liquid-metal coolants was developed and validated, and the target product was manufactured.

Project UITP-MT-99 to develop a set of technologies and equipment for additive manufacturing of complex-shaped and large-sized products for the nuclear industry (2022 project stage)

- As part of the project, a direct laser deposition printer was developed and manufactured, a technology for 3D-printing of in-vessel components for VVER reactors was developed, and a core baffle fragment with specified properties and characteristics was printed for testing.

Hydrogen energy

Programme of electrochemical technology development in ROSATOM until 2030

- The programme of electrochemical technology development was finalised, projects under the programme were prepared for launching.
- The establishment of an R&D Centre of Electrochemical Technologies for Hydrogen Energy was launched.
- The head of research for energy accumulation and storage systems was appointed.

Technology development and setting up new manufacturing operations

- As part of the project to launch the manufacturing of rolled SAV aluminium alloy products for ROSATOM enterprises, NCCP PJSC set up the production of assorted pipe and bar products.
- Certification of fuel elements and NFAs was completed, fuel assemblies for start-up loading and the first reloading of the CFR-600 fast reactor (China) were manufactured.
- The Chepetsk Mechanical Plant launched large-scale production of sponge zirconium based on the chloride process. The plant's products are used for cladding fuel elements in fuel supplied to foreign and Russian NPPs.

Plans for 2023

Nuclear fuel cycle:

- To manufacture pilot TVS-5.
- To obtain licences for pilot operation of three combined TVS-2M assemblies with accident-tolerant fuel elements at power unit No. 2 of Rostov NPP during the 11th fuel campaign.
- To manufacture, install at CMP JSC and perform preliminary trials of the pilot unit for coating the zirconium cladding of fuel elements with chromium.
- To perform scheduled work under the project to develop accident tolerant fuel based on U3Si2.
- To perform comprehensive validation exercise for nuclear fuel designed for the BRR-200 research reactor in the Centre for Nuclear Technology Research and Development in Bolivia.
- To finalise the technology for manufacturing experimental fuel elements with U-Mo-Si fuel.
- To rump up the production of sponge zirconium at CMP JSC to design capacity.

Non-nuclear businesses

- To manufacture a prototype selective laser melting printer for 3D printing.
- To facilitate the implementation of projects included in the Federal Road Map for the Development of the Technologies for New Materials and Substances (within the Division’s area of responsibility).
- To establish and support the operations of an R&D Centre.
- To manufacture a prototype containerised electrolyser with a capacity of 50 nm3/h for the first stage of testing.
- To introduce digital engineering methods into product design and development processes.

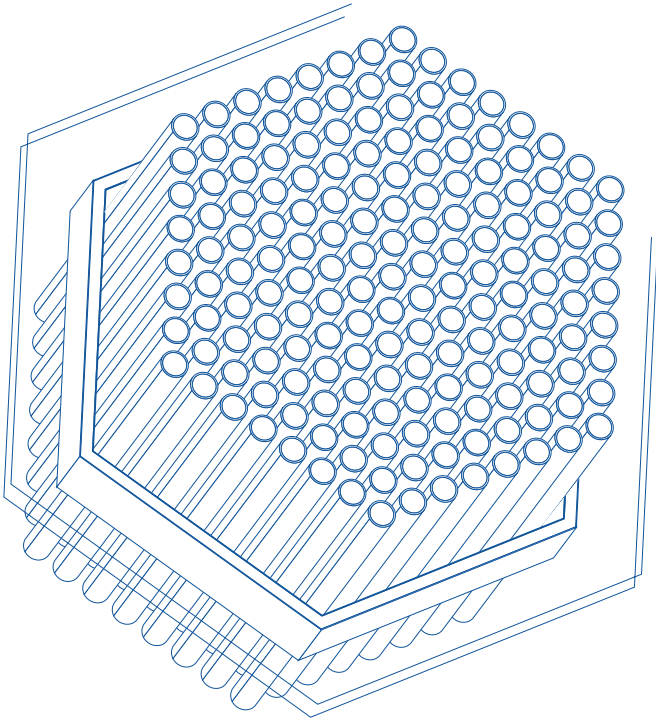
Technology development and setting up new manufacturing operations

- To put into operation full scale production of SAV alloy pipe and bar products for consumption by ROSATOM’s enterprises, including a chemical processing and coating line.
- To manufacture and install at MSZ JSC additional equipment to ramp up the production of stainless steel pipes, in particular, for the fuel system of the Chinese CFR-600 reactor.

Intellectual property

Patent activity of the Division

Indicator	2020	2021	2022
Number of intellectual property assets owned by TVEL JSC at year end (cumulative)	1,790	1,830	1,838
Number of patents obtained			
- Inventions (Russian)	22	33	16
- Inventions (foreign)	10	10	13
- Utility models (Russian)	3	1	0
- Computer software	7	11	13
- Trade secrets (know-how)	135	77	109



An aerial photograph of a forest road. A large, white, curved vessel component is being transported on a red trailer. The road is surrounded by dense forest with trees in various shades of green and yellow. A white line with a triangle points to the road ahead.

5

**CONTRIBUTION TO THE
TECHNOLOGICAL SOVEREIGNTY.
NEW PRODUCTS AND BUSINESSES**

6

SAFETY OF OPERATIONS

**RUB 2.367 BILLION
ENVIRONMENTAL COSTS**

The delivery of vessel components for the innovative BREST-OD-300 reactor to Seversk



5

CONTRIBUTION TO THE TECHNOLOGICAL SOVEREIGNTY. NEW PRODUCTS AND BUSINESSES

The Fuel 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, additive manufacturing, hydrogen energy, etc.

Metals production

- The range of titanium products for shipbuilding and the aircraft industry was expanded;
- The first batch of bioceramic dental implants was delivered to register the medical product and bring it to the Russian market;
- Serial batches of medical titanium bars and wire were shipped to key domestic manufacturers of medical implantable products. These bars were 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 successfully passed industrial tests. Serial batches of wire have been supplied 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 was set up;
- Process parameters were tested for the machining of rare-earth magnets and the application of a multilayer protective coating on them; a pilot batch was manufactured, and samples of finished products were sent for the requisite examination and testing. Permanent rare-earth magnets are used primarily in wind power generation and electric vehicles.

Special chemicals

In 2022, the first samples of battery-grade lithium hydroxide produced by JSC Angarsk Electrolysis Chemical Plant (AECF JSC) were shipped. The pilot plant for the manufacture of lithium hydroxide was launched in 2021. In the future, the Company plans to expand its sales footprint; work is underway to set up large-scale production.

Energy storage systems

Gigafactory construction start

In October 2022, the construction of Russia's first 'gigafactory' designed using state-of-the-art technologies was started in the Kaliningrad Region. The enterprise will manufacture world-class products, namely lithium-ion batteries (cells), and assemble them into battery modules.

The factory will be the country's largest enterprise 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.

'Megafactory' launch:

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

MZP JSC 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 line set up at MZP in 2021. The annual output will be up to 150 MWh of batteries for stationary systems (the total capacity of manufactured devices) or ~2,000 traction batteries for electric vehicles.

Additive manufacturing

- An Additive Manufacturing Centre was opened in Novouralsk (Sverdlovsk Region).
- A pilot sample of a DMD printer based on two industrial robots and a positioner was put into operation; a relevant technology was developed, and a fragment of a partition for an in-vessel component of a VVER-TOI reactor was produced.
- Mass production of stainless steel powders was launched.
- An integrated process chain for the printing of products involving heat treatment in a vacuum kiln, post-processing and 3D scanning was set up in the Moscow Additive Manufacturing Centre.
- Components for the aircraft industry were printed from heat-resistant superalloys in the Additive Manufacturing Centres in Moscow and Novouralsk.
- An automated additive manufacturing facility for repairs and production (MARPAK) was designed.

Digital products

Results in 2022:

- The Ministry of Digital Development, Communications and Mass Media of the Russian Federation included the AtomMind information system for predicting the quality of products and the state of equipment, developed by TVEL JSC, in the Unified Register of Russian Programmes for Electronic Computers and Databases. AtomMind is an industry digitisation platform, which provides predictive analytics tools for efficient equipment maintenance and repairs and for product quality assurance.
- AtomBot.Procurement, a digital product developed in TVEL JSC, was included in the Unified Register of Russian Programmes for Electronic Computers and Databases. AtomBot.Procurement is the first digital product for procurement automation based on artificial intelligence and the use of software robots, which significantly increases the efficiency of procurement documentation management.
- T-COM LLC (a company of ROSATOM's Fuel Division) launched a workshop for the SKD assembly of telecommunications equipment at the Moscow Polymetal Plant. 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 included in the register of domestic software. The partner network of LLC T-COM has grown to 140 companies in less than a year.

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:

- To manufacture and supply fuel for the initial loading of the first power units of Akkuyu NPP (Turkey) and Rooppur NPP (Bangladesh).
- To complete the first cycle and start the second cycle of pilot operation of accident tolerant fuel (ATF) at Rostov NPP;
- To manufacture experimental fifth-generation fuel assemblies (TVS-5) and deliver them to one of the Russian NPPs;
- To build an industrial plant for applying chromium coatings on zirconium alloy cladding of fuel elements at the Chepetsk Mechanical Plant;
- 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.

Additive manufacturing:

- To bring mass-produced 3D printers using metal powder compositions and wire materials to market;
- To start mass production of stainless steel powders, superalloys and titanium alloys, and to continue expanding the network of additive manufacturing centres.

Energy storage systems:

- To open a new assembly site for the production of energy storage systems in the Technopolis park.

Digital products:

- To bring the AtomReverse digital service to market. The product combines engineering solutions for replicating and optimising equipment and its components.

Hydrogen energy:

- To manufacture and test a prototype 50 m³/h electrolyser for hydrogen production.

Metals production:

- To expand calcium injection wire production capacity.
- To bring implantable products for osteosynthesis, prosthetic implants for the arthroplasty of large human joints and high-technology surgical instruments to the Russian market.
- To develop new types of conductor products based on copper-niobium and other alloys.



Safety of nuclear technologies and products

The environmental policy of TVEL Fuel Company is focused on ensuring nuclear and radiation safety at all of the Company’s facilities and preventing radiation exposure of personnel, the general public and the environment.

Radiation monitoring

The Programme for the Development of the Industry-Wide Radiation Monitoring System for 2021–2030 was approved for the Division by order of ROSATOM.

The Company developed an action plan to implement the Programme. The plan provides for the standardisation of radiation measurement methods across the Division’s organisations and the reequipping of radiation monitoring laboratories at VNIINM JSC and SCP JSC.

Elimination of the nuclear legacy

TVEL Fuel Company implements a strategic Environmental Responsibility initiative and takes steps to address the nuclear legacy, including the rehabilitation of contaminated territories.

In 2016, a new Federal Target Programme on Nuclear and Radiation Safety for 2016–2020 and for the Period Until 2030¹ was launched.

Programme for Safe Treatment of Depleted Uranium Hexafluoride

ROSATOM is implementing the Programme for Safe Treatment of Depleted Uranium Hexafluoride (DUHF). The Programme is focused on proceeding from accumulation to planned decrease and complete elimination of existing DUHF stocks.

The programme covers the following areas:

- using all ‘rich’ heaps accumulated through the use of diffusion technology and first-generation gas centrifuges as raw materials for enriched uranium production;
- building new W-type units for reconversion of DUHF into depleted uranium oxides;
- reducing the number of separation facilities used for DUHF storage from four to two within 15 years.

The programme includes the following key stages:

- Increasing the capacity of defluorination units at ECP JSC to 20,000 tonnes of DUHF per year to stop the growth of DUHF stocks by 2024;

Competence centres for decommissioning

Competence centres for the decommissioning of facilities posing nuclear and radiation hazards have been established in SCP JSC, AECJ JSC, Central Design and Technological Institute (TSPTI) JSC and VNIINM JSC. The key objective of these centres is to prepare for the decommissioning of and decommission facilities posing nuclear and radiation hazards both in Russia and abroad using the enterprises’ own resources.

1. FTP NRS 2, for details see <http://фцп-яп62030.pdf>

- Starting from 2027–2028, gradual reduction of DUHF stocks through the commissioning of new W-UEIP units with a capacity of 20,000 tonnes of DUHF per year and W3-ECP units with a capacity of 10,000 tonnes of DUHF per year;
- Complete removal of DUHF from the site of AECF JSC by 2035 and from the site of SCP JSC by 2038.

The Programme is expected to be completed in 2057 with full elimination of DUHF stocks at all sites.

Environmental safety

Construction of new DUHF reconversion facilities in Zelenogorsk

PA ECP JSC continues to expand its DUHF defluorination project by building W2-ECP processing unit. The project will increase the capacity of ECP’s DUHF processing plant from 10,000 to 20,000 tonnes of DUHF per year. Orano Projets completed the deliveries of imported equipment in 2022. Construction and equipment installation are in progress.

Construction of new DUHF reconversion facilities in Novouralsk

Under a similar project to launch W-UEIP units with a capacity of 20,000 tonnes of DUHF per year at the Ural Electrochemical Integrated Plant (UEIP JSC), the Central Design and Technological Institute completed a feasibility study of the investment project. The study received a positive assessment of ROSATOM’s industry experts. In 2022, engineering surveys were completed at the future construction site, and an engineering agreement was negotiated with the Central Design and Technological Institute.

The functioning of the Integrated Management System and the Corporate Environmental Management System as an integral part of the IMS, as well as the compliance with sustainability principles, are top priorities in environmental protection and safety for the Fuel Company.

The consistent application of environmental policy guidelines and a uniform methodology for identifying environmental aspects and assessing environmental risks and opportunities supports the allocation of funds to the most important tasks, resulting in improved environmental performance.

Energy conservation and energy efficiency improvement programme

The Division is a leader in the implementation of automated energy accounting systems and a methodology for improving energy efficiency in the nuclear industry, including the implementation of specific energy conservation measures, energy audits, and development of long-term investment,

administrative and technical programmes. Since 2011, the Division has been implementing the Energy Saving and Energy Efficiency Improvement Programme (‘the Programme’), approved on the basis of energy audits and thermal inspections at Company enterprises.

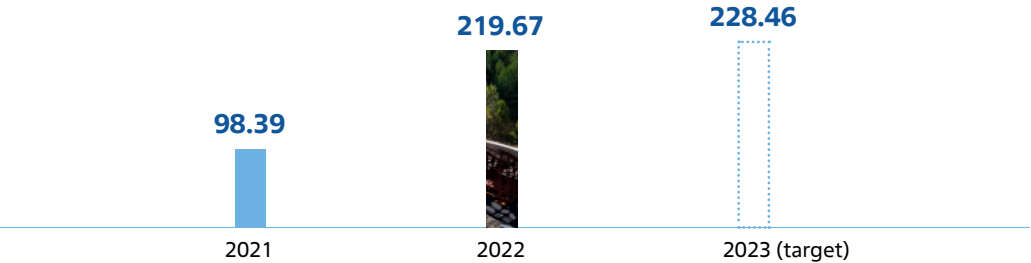
GRI 302-1 In 2022, electricity and heat consumption in the companies controlled by TVEL Fuel Company was reduced by 2.39% (to 71.85 million kWh) and 9.16% (to 187,040 Gcal) respectively, compared to 2020 as the base year under comparable conditions.

GRI 302-4 Energy consumption was reduced by 4.9% (RUB 624.35 million) compared to 2020, against a target of 1.0%.

Importantly, the decrease in energy consumption did not involve a reduction in the scope of the production programme of the Company. It was achieved through the implementation of measures envisaged by the Energy Saving and Energy Efficiency Improvement Programme. In 2022, the Company invested RUB 324.18 million in the Programme. In 2023, it plans to allocate RUB 1,207 million for energy conservation initiatives.

In 2020–2022, enterprises of the Fuel Company conducted a comprehensive survey of power plants and networks, including power supply, lighting, heat supply, ventilation and air conditioning, and water supply systems, as well as support equipment. Based on the findings of the energy audit, the Company’s enterprises completed thermal inspections and certification of buildings and facilities, prepared energy passports of enterprises, and developed an action plan to improve the fuel and energy efficiency by 2025. In 2022, an Energy Saving and Energy Efficiency Improvement Programme for 2023–2027 was approved for ROSATOM and its subsidiaries.

Total energy savings from energy conservation and energy efficiency improvement measures, under conditions comparable to 2020 base year, RUB million



Use of primary energy sources, million GJ¹

Energy source	2021	2022	2023 (target)
Gas	0.21	2.13	2.08

Industrial and consumer waste management

In 2022, the total amount of industrial and consumer waste generated by the Company’s enterprises decreased by 11% year on year to 28,500 tonnes. The decrease in generated industrial and consumption waste in 2022 was driven by a decrease in the amount of construction waste after the completion of dismantling works in preparation for the second phase of the DUHF defluorination project: the construction of the W2-ECP unit.

The major part of the waste was hazard class 5 waste (practically non-hazardous), mainly scrap and metal waste transferred to specialised organisations for processing and disposal.

1. Including those associated with electricity and heat generation at thermal power plants in the Division’s companies.

Water consumption and discharge

- GRI 303-2

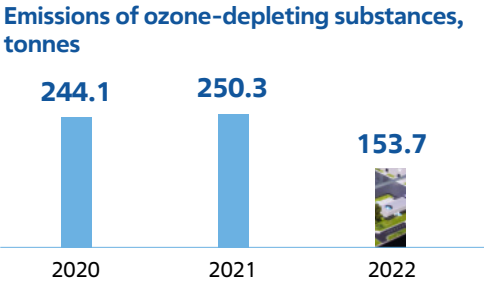
GRI 303-4
- In 2022, water withdrawal by the Company’s enterprises increased by 21% to 568.4 million m³, while water consumption for operational needs increased by 9% to 214.9 million m³. As a result, the Company’s enterprises discharged 277 million m³ of water (70% of the permissible limit) into water bodies, or a major portion of the total water discharge. The increase in water withdrawal was driven by growing water use, including the use by third-party consumers, e.g., customers of UEIP JSC.
- GRI 303-3
- The water withdrawal limit for 2022 was set at 537.3 million m³, while the actual water withdrawal was 106% of the limit.

The volume of recycled water was 322.5 million m³ in 2022. The share of recycled and reused water in the total water withdrawal was 57% and 0.02% respectively.

Pollutant emissions

In 2022, the total pollutant emissions into the atmosphere from the Company’s enterprises decreased by 21% to 1,100 tonnes (22% of the permissible limit). The decrease in the total pollutant emissions into the atmosphere was mainly driven by measures taken by CMP JSC to compile an inventory of pollutant emissions and by the use of gas chromatographic analysis to quantify industrial emissions of tetrafluoromethane (Freon 14) and dichlorodifluoromethane (Freon 12).

The largest volume of emissions was recorded at CMP JSC as a result of chemical and metals production processes.



Emissions of ozone-depleting substances in 2022

Substance	Emissions in natural tonnes	Emissions in tonnes of CFC-11 equivalent
Dichlorodifluoromethane (Freon 12)	20.946	20.946
Chlorodifluoromethane (Freon 22)	5.665	0.283
Chlorotrifluoromethane (Freon 13)	123.748	123.748
Tetrafluoromethane (Freon 14)	4.722	0.236
1,1-Dichloro-1-fluoroethane (Freon 141b)	3.36	0.37
Total	158.441	145.6

GRI 305-7 Emissions of NOx, SOx, ‘000 tonnes

Indicator	2020	2021	2022
Nitrogen oxide (NOx) emissions	0,2	0,2	0,2
Sulphur oxide (NOx) emissions	0,1	0,1	0,1

As for estimated greenhouse gas emissions, in 2022, the Division participated in the industry-wide pilot calculation of greenhouse gas emissions in accordance with international methodologies (Scope 1 and Scope 2) conducted by ROSATOM. Cumulative GHG emission estimates are presented in section 1.2 ‘Sustainable Development Management’ of ROSATOM’s Public Annual Report for 2022. The reporting of GHG emission data by division is expected from 2023, when an industry-wide GHG emission management system is implemented.

In 2022, there were no emergencies or incidents at the Division’s enterprises that could have a negative impact on the environment.

Impact on areas of high biodiversity value

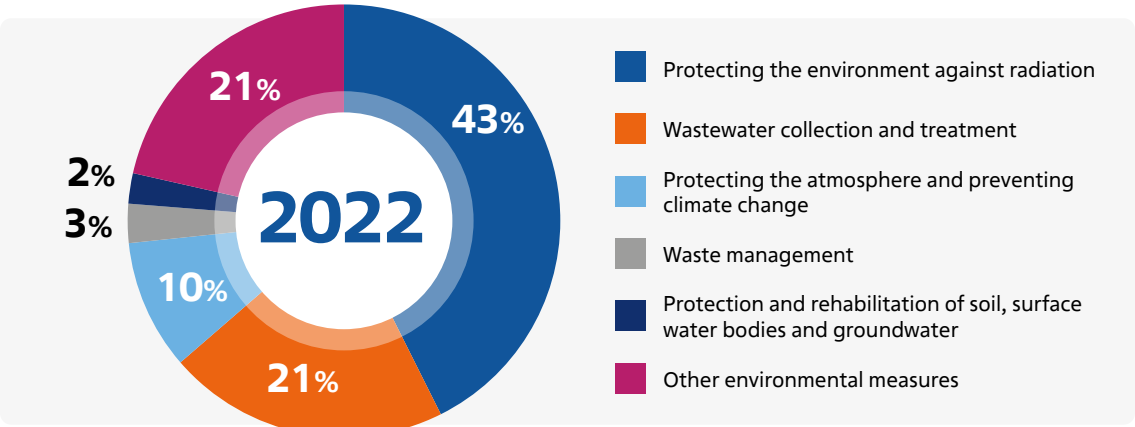
Enterprises of TVEL JSC are located on lands owned by enterprises and on lands owned by the Russian Federation and used on a leasehold basis. The industrial sites of the Company’s enterprises and the territories adjacent to them are neither areas with a high biodiversity value nor protected natural areas. Accordingly, no impact management strategy is required.

Environmental costs, RUB million¹

Cost item	2020	2021	2022
Protection of the environment against radiation	838.2	1,005.9	1,008,5
Wastewater collection and treatment	478.6	500.6	497.8
Protection of atmosphere and climate change prevention	198.3	235.4	229.8
Waste management	45.5	49.5	69.1
Protection and rehabilitation of soil, surface water bodies and groundwater	43.7	45.0	53.8
Other environmental measures	384.8	509.4	507,9
Total	1,989.1	2,345.8	2,366.8

1. The funds were allocated for both technical and organisational measures.

Breakdown of environmental costs in 2022, %



UEIP JSC, SCP JSC and CMP JSC accounted for the largest share of environmental costs in the Division.

Protection of the environment against radiation (RUB 1,008.5 million) accounted for the largest share of environmental costs. Significant costs were also associated with wastewater collection and treatment (RUB 497.8 million).

Occupational health and safety

The Occupational Health and Safety Policy of TVEL JSC stipulates the main focus areas, guidelines and responsibilities for protecting health and safety of Company employees. The Company implements a special communication programme focused on enhancing the awareness, openness, and personal responsibility of employees for health and safety issues, which has a material effect on the adoption of safe work practices.

In 2022, the Company’s occupational health and safety costs¹ totalled RUB 1.8 billion, or RUB 70,900 per employee.

The injury frequency rate (calculated as the number of injuries per 1,000 employees) was 0.19 in 2022. There have been no fatal accidents among employees of the Fuel Company in the last three years.

There were no industrial accidents in contractor organisations performing work at the production sites of the Fuel Company in 2022.

In 2022, commissions set up in the subsidiaries inspected the condition of metal-working equipment for compliance with the Interindustry Rules on Labour Safety in Cold Metal Working and the Technical Regulation of the Customs Union on the Safety of Machinery and Equipment. A review of technological

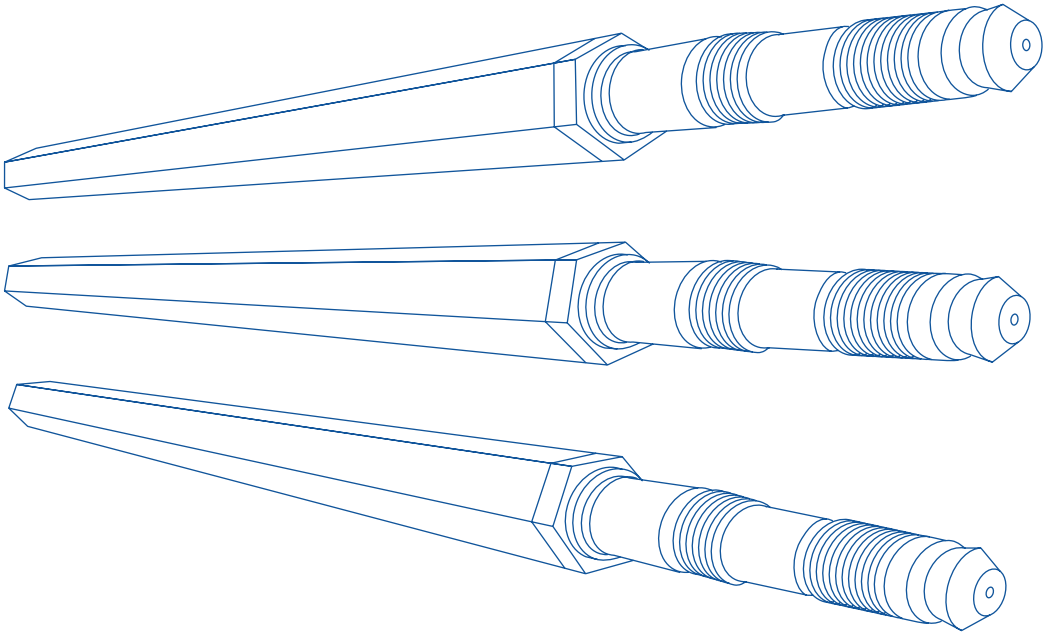
In 2022, TVEL Fuel Company had the Lost Time Injury Frequency Rate (LTIFR) of 0.09, with the target set by ROSATOM at 0.3 The number of accidents increased from two to four compared to 2021; however, the number of severe injuries decreased from two to one. There were no cases of industrial injuries in contractor organisations in 2022.

1. Including CFR-3 and CFR-4.

documentation on metal working processes was organised and carried out to bring it in line with the requirements of the State Standard (GOST) on the Unified System for Technological Documentation. All deviations identified by the review were addressed in the normal course of business.

Number of industrial accidents

	2020		2021		2022	
	TVEL JSC	Contractors	TVEL JSC	Contractors	TVEL JSC	Contractors
Total	1	4	2	2	4	0
including fatalities	0	0	0	1	0	0



7

DIGITISATION

8

DEVELOPING THE HUMAN CAPITAL

RUB 1,630.42
MLN

SOCIAL EXPENSES
OF THE DIVISION



7 | DIGITISATION

Digitalisation objectives and management system

The Fuel Division is implementing digital transformation in accordance with the approved Digital Strategy of the Division until 2030. The Strategy includes more than 210 projects in all of the key business development areas, which are focused on winning digital leadership and developing business competencies necessary to achieve the strategic goals of the Division.

The Division is implementing an IT product strategy aimed at creating, developing, and marketing its own digital products. As part of the strategy, new IT projects are implemented and the existing products are improved. There is strong focus on introducing solutions, the combination of which will both reduce the process time and labour costs and support business continuity and the demand in the long term.

A large-scale rollout of robotic process automation and artificial intelligence tools is underway at pilot sites in the Division. These tools automate the routine operations of collecting and analysing the sources of price information, setting the initial maximum price on the basis of data analysis, and use machine learning principles to analyse technical specifications for the purchase of materials without any staff involvement. In 2023 and 2024, the Division plans to expand the functionality of these tools and roll them out across all Division entities.

In 2022, the coverage of analytical solutions for monitoring and timely notification of irregularities in logistics processes was significantly increased. This trend is expected to continue in 2023.

The Fuel Division also acts as a pilot platform for the implementation of industry initiatives in the area of procurement. Projects at an active stage include the implementation of the BRIEF system, which simplifies the procedure for purchasing products manufactured by industry enterprises, and the UIS Contract, a full-featured solution for communicating with suppliers in the process of purchase contract performance.

The Digital Strategy provides for the implementation of a group of projects based on the AtomMind platform and aimed at rolling out predictive analytics systems across the Division's enterprises, as well as for the development and implementation of a module for centralised data management.

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 and making the experience in nuclear industry digitisation available to manufacturing companies. The Division is developing four product areas: digital engineering, predictive analytics, enterprise robotisation and automation, and telecommunications equipment.

Key digital products:

- AtomMind is an industry digitisation platform, which provides predictive analytics tools for efficient equipment maintenance and repairs and for product quality assurance.
- AtomRevers combines digital technologies for efficient import substitution. It offers a range of engineering solutions for the reproduction and optimisation of existing components, assemblies, units and machines.
- AtomBot is a combination of solutions for business automation, the robotisation of business processes and analytics. The project is focused on two areas: RPA (Robotic Process Automation) is an automation tool for processes, which can be based on clear algorithms. BI (Business Intelligence) is a convenient system for data analysis and visualisation.
- T-COM provides network and telecommunications equipment, which does not rely on imported technology, and develops domestic software for building and upgrading corporate data transmission networks.

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

Key digital transformation areas

The digital strategy is mainly focused on the following:

- Increasing the role of import substitution in the implementation of new digital solutions and the development of the existing ones;
- Reaching a new level in data management, including digital twins, artificial intelligence technologies, big data processing and predictive analytics;
- Introducing key end-to-end technologies, robotic process automation, and virtual and augmented reality technologies;
- Developing and promoting in-house digital products among partners and customers.

Key results in 2022 and plans for 2023

Business area	Key results in 2022	Plans for 2023
Business apps	<ul style="list-style-type: none">- A system for business planning, budgeting and forecasting and a customer relationship management (CRM) system for non-nuclear businesses were put into operation.- Projects to develop an intellectual data management system for key data and a system for tracking candidates prior to employment were launched.- An AI system for R&D verification was put into operation.- The equipment maintenance and repairs management system (EMRMS) was launched at VPO TOCHMASH JSC, KMZ PJSC, SCP JSC, and PA ECP JSC.- A system for reviewing supplier offers was put into operation. AI tools for procurement were developed.- A project to develop a system for the operationalisation of the Division's Digital Strategy was launched.- A project on the application of smart contract tools in procurement was launched.- A project to develop an intellectual procurement monitoring system was launched.- A project to develop a portal facilitating prompt selection of contractors for specific tasks was launched.- The Division is implementing 22 industry projects at different stages.	<ul style="list-style-type: none">- To further develop the Fuel Company's performance monitoring and analysis system.- To further develop the Fuel Company's business planning, budgeting and forecasting system, in particular, detailed HR models and information technologies.- To implement EMRMS at NPO Centrotech LLC, AECP JSC, and VNIINM JSC.- To pilot the mobile EMRMS app and multiresource scheduling functionality at CMP JSC and UEIP JSC.- To develop a production planning system for the Division's supply chain- To roll out the smart contact constructor across the Fuel Company and upgrade it to a document constructor.- To implement an online user support and training system.- To improve the efficiency of business processes in the Company's Treasury Department.- To develop the Company's CRM system and e-commerce websites.- To implement a library of internal regulations and roll it out across the Fuel Company.- To develop a corporate portal for the Division and roll it out at the enterprises.
Digitalisation of product lifecycle management	<ul style="list-style-type: none">- A unified division-wide product data management system (PDM FC) was put into operation at TVEL JSC, MSZ JSC, VNIINM JSC, CMP JSC, NCCP PJSC, and NCPP-Instrument LLC.- A laboratory management system was put into operation at PA EC JSC. The LIMS project was launched at VPO TOCHMASH JSC (KMZ PJSC).- The TVEL-AEM PLM system developed to support electronic communication on design projects and the development of design documentation between TVEL JSC, MSZ JSC, NCCP PJSC, and OKBM Afrikantov was put into operation.- Technical specifications were developed for, and the assessment of an import-substituting real-time discrete production management system was completed.	<ul style="list-style-type: none">- To complete the migration of technical documentation on nuclear fuel manufacturing into the Division's PDM system.- To launch the roll-out of the laboratory management system at UEIP JSC.- To launch the development of a requirements management system.- To launch the roll-out of the PDM system at the Division's enterprises.- To launch a project to develop an import-substituting Manufacturing Execution System (MES) at MSZ JSC and VPO TOCHMASH JSC.- To launch a project to develop an import-substituting plant digitalisation system for the sublimation separation plants.

Business area	Key results in 2022	Plans for 2023
Infrastructure and cybersecurity	<ul style="list-style-type: none">- Import substituting office software and operating systems were introduced across the Division (65% of workstations).- A sheltered automation system of TVEL JSC received a certificate of compliance with the latest cybersecurity requirements.- Stress testing of the IT infrastructure of the Division's enterprises was performed.- Backup requirements were identified and a strategic IT product reserve was created.	<ul style="list-style-type: none">- To implement industry-wide and division-wide plans for import substitution, including the use of domestic office software and operating systems at 100% of workstations across the Division.- To scale the 3D VDI infrastructure as part of the PDM system rollout project.- To design and develop a standard import-substituting infrastructure for the enterprises.- To introduce import-substituting software and hardware at key facilities.- To implement comprehensive confidentiality management and raw data access control systems.- To develop a standard solution for conference room equipment and upgrade two main conference rooms.
Data management (predictive analytics system)	<ul style="list-style-type: none">- A predictive analytics system was put into operation at CMP JSC.- MSZ JSC launched the development of a predictive analytics system.- NCCP PJSC developed technical specifications and completed project initiation procedures.- SCP PJSC developed technical specifications and completed project initiation procedures.- VPO TOCHMASH JSC developed technical specifications and completed project initiation procedures.- KMZ PJSC developed technical specifications and completed project initiation procedures.	<ul style="list-style-type: none">- To launch the development of the predictive analytics system for the BTU sintering furnace, Hosokawa granulation unit, and Courtoy presses at MSZ JSC.- To launch the development of technical specifications for a predictive analytics project at AECP JSC.- To enhance the predictive analytics system and improve equipment availability at CMP JSC.- To launch the development of a predictive analytics system for balancing gas centrifuge rotors at KMZ PJSC.- To launch the development of a predictive analytics system for monitoring production equipment (~700 CNC machines) at VPO TOCHMASH JSC.- To develop technical specifications and complete project initiation procedures for vibration-based diagnostics of compression machinery and product quality control for compliance with full relative density standards at PA ECP JSC.- To roll out the predictive analysis system to the manufacturing of titanium and calcium products and improving M&R efficiency at CMP JSC.- To launch the development of a predictive analytics system for quality control of filled fuel elements at NCCP PJSC.- To launch the development of a predictive analytics system for flame reactors and the loading station at SCP JSC.- To approve the concept and develop a centralised system architecture.

Business area	Key results in 2022	Plans for 2023
Digital products	<div>Cooperation development and partnerships</div> <ul style="list-style-type: none">– The partner network of T-COM in Russia grew to more than 140 companies, including six direct partners and two distributors.– The Fuel Company presented its digital product portfolio.– Partnership agreements with Robin and Visiology were extended.– Centres of competence for CRM, BI, AI, and RPA were established.– T-COM equipment was included in the project documentation for the construction of the National Centre for Physics and Mathematics (NCPM) in Sarov. <div>Product development</div> <ul style="list-style-type: none">– An R&D centre was established, the company strengthened its positions in the switch software development market.– A project to design and develop two access switch models was completed.– Agreements were signed with several large Russian companies for digital R&D and reverse engineering projects.– The strategy for AtomMind development was approved; the AtomMind software and trademark were registered with Rospatent.– The AtomMind platform and the control software for T-COM switches (TGC-121-xx, TGC-121xx/CLI and TGC-125-xx) were entered into the register of domestic software.	<div>Cooperation development and partnerships</div> <ul style="list-style-type: none">– To enter the Belarusian market.– To perform product testing with Security Code LLC and announce the compatibility of two brands with T-COM products in Russia.– To sign and perform reverse engineering contracts with large Russian companies. <div>Product development</div> <ul style="list-style-type: none">– To complete a design and development project for a family of TGC-121 access switches (six models) and enter the products into the Unified Register of Russian Radio Electronic Products.– To study a hypothetical project to expand T-COM product line with Wi-Fi devices and the prospects of their certification.– To design and develop aggregation switches and enter them into the unified register of domestic software.– To position the AtomBot product line.

Import substitution

In 2022, domestic software accounted for 83% of total software purchases in the Fuel Division.

Import substitution plan for 2023

- To introduce the industry-wide and division-wide import substitution plans by order of TVEL JSC;
- To prepare and approve import substitution plans for CFR-3 based on local activities;
- To implement approved plans for TVEL Fuel Company and CFR-3 and achieve the approved targets for import-substituting software.



8 | DEVELOPING THE HUMAN CAPITAL

Human resource management is primarily focused on maintaining a balance between the interests of employees and the employer and the efficient development of professional and managerial competencies in accordance with the strategic goals of the Fuel Division.

The HR policy of the Division is aimed at providing its organisations with the required number of engaged employees with appropriate skills in a timely and cost-effective manner.

The key areas of the HR Policy include the following:

- Promoting the employer brands of the Corporation and its organisations and recruiting high-potential graduates of secondary vocational education institutions and higher education institutions, including target universities.
- Developing a system of professional competencies for the nuclear industry.
- Improving professional skills of employees, in particular, by means of professional competitions and professional skills contests and participating in such competitions at the national and international levels.
- Succession planning for critical positions.
- Training and developing employees and managers of the Corporation and its organisations, as well as individuals included in the executive talent pool.
- Improving labour productivity through professional development of employees and work management improvements.
- Ensuring the effectiveness of incentives.
- Increasing employee engagement in the business of the Corporation and its organisations to improve efficiency.
- Developing corporate culture, including sustainable development values.
- Implementing a policy aimed at ensuring equal opportunities in employment and occupation.

The following key principles of personnel management support the attainment of strategic goals:

- Caring for people
- Partnership
- Safety

All areas of HR management aimed at promoting the Division’s goals are focused on ensuring the long-term workforce sustainability of the Division.

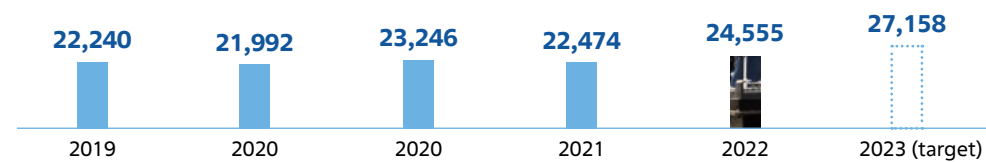
Personnel characteristics

The number of employees is growing in line with the expansion of general business operations. The manufacture of non-nuclear products provides the Company with access to new product markets and geographic regions, while opening up additional employment opportunities for qualified personnel released as a result of streamlining the core operations. In the reporting year, the Company had an average headcount of 23,382 employees.

Average headcount, persons

2020	2021	2022
21,946	21,958	23,382

TVEL Fuel Company headcount, persons



In 2022, TVEL Fuel Company created 676 new jobs. Women account for 100% of senior executives (CEO-2) and 29% of the Division's directors.

Share of women in the total headcount, %

2020	2021	2022
32.18	35.18	33.07

GRI 2-7 GRI 2-8 Number of employees by gender and type of employment

Women	Men	Total
Total number of employees		
8,326.00	16,229.00	24,555.00
Number of employees with indefinite employment contracts		
8,117.00	16,018.00	24,135.00
Number of employees with fixed-term employment contracts		
209.00	211.00	420.00
Number of full-time employees		
7,516.00	13,847.00	21,363.00
Number of part-time employees		
810.00	2,382.00	3,192.00
For information: number of employees working under service contracts		
0.00	3.00	3.00

Number of employees by type of employment, gender and region

Region	Number of employees with indefinite employment contracts		Number of employees with fixed-term employment contracts		Number of full-time employees		Number of part-time employees		Total number of employees	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
Moscow	1,558.00	1,807.00	31.00	28.00	1,482.00	1,601.00	107.00	234.00	1,589.00	1,835.00
Moscow Region	1,376.00	2,570.00	12.00	29.00	1,085.00	2,018.00	303.00	581.00	1,388.00	2,599.00
Vladimir Region	334.00	271.00	4.00	0.00	325.00	257.00	13.00	14.00	338.00	271.00
Udmurt Republic	1,095.00	2,599.00	35.00	72.00	938.00	1,811.00	192.00	860.00	1,130.00	2,671.00
Novosibirsk Region	496.00	959.00	9.00	4.00	428.00	779.00	77.00	184.00	505.00	963.00
Sverdlovsk Region	1,268.00	2,636.00	30.00	20.00	1,281.00	2,606.00	17.00	50.00	1,298.00	2,656.00
Tomsk Region	1,127.00	2,794.00	55.00	41.00	1,118.00	2,502.00	64.00	333.00	1,182.00	2,835.00
Krasnoyarsk Territory	500.00	1,427.00	7.00	9.00	474.00	1,321.00	33.00	115.00	507.00	1,436.00
Irkutsk Region	233.00	740.00	25.00	5.00	258.00	744.00	0.00	1.00	258.00	745.00
Germany	44.00	75.00	0.00	0.00	44.00	75.00	0.00	0.00	44.00	75.00
Saint Petersburg	86.00	140.00	1.00	3.00	83.00	133.00	4.00	10.00	87.00	143.00

Employee engagement

Employee engagement and commitment to the Division’s mission and success are major drivers of business efficiency and performance. Accordingly, the level of employee engagement is a priority for the nuclear industry. Division and industry enterprises conduct an annual employee engagement survey under a single brand, Your Opinion Matters to ROSATOM. Annual surveys provide an insight into the attitude of enterprise teams and are used to measure trends in the level of satisfaction with working conditions across 14 factors and assess the share of engaged employees.

Personnel turnover rate, %

2020	2021	2022
8.60	4.66	4.88

Based on survey findings, the management of each enterprise develops the relevant action plans aimed at maintaining and improving the employee engagement rate and addressing the factors which, according to the survey, have deteriorated over the year.

These efforts help the Fuel Division to remain a leader among the industry divisions in terms of employee engagement, with the final scores matching those of the Best Employers in Russia.

Employee engagement rate, average across the Division, %

2020	2021	2022
86	86	86

Motivation and remuneration

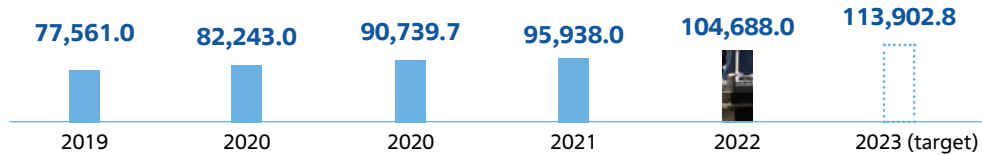
Motivation and remuneration initiatives in 2022:

- Indexation of wages at all enterprises of the Fuel Company in two stages: by 10% starting from 1 April 2022 and by 8% starting from 1 September 2022;
- Increase in the size of ad hoc bonuses in certain enterprises;
- Case-by-case revisions of the integrated incentive bonus for employees based on annual performance assessment;
- Advance payment of up to 50% of the annual bonus;
- Analysis of the effectiveness of remuneration and incentive systems in the Division’s enterprises, collection of employees’ suggestions on making changes to payroll documents.

The Division’s incentive and remuneration policy is aimed at providing competitive remuneration. In the reporting period, the average monthly salary grew by 12% year on year to RUB 104,688¹.

1. Including TVEL JSC.

Average salary in the Division (including TVEL JSC), RUB



Share of variable remuneration in the wage structure of employees (except for senior executives), %

2020	2021	2022
20.57	20.13	17.82

Share of employees covered by wage indexation (on or above inflation level), %

2020	2021	2022
99	99	100

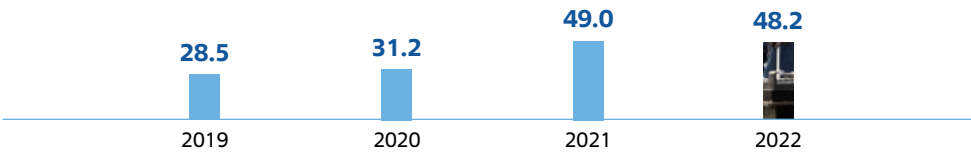
Personnel training

High-skilled employees who have unique knowledge and develop their competencies have always been an important asset and a guarantee of internal business stability and modernisation for TVEL Fuel Company. The Company’s HR policy prioritises personnel training and development.

Enterprises of the Division regularly organise training programmes aimed at developing employees’ competences in accordance with the Regulations on Personnel Training and Development. In 2022, investments in personnel training totalled RUB 157.6 million. The number of the Division’s employees who completed at least one training programme reached 15,202 persons in the reporting year.

In 2022, 1,404 employees completed a training course on human rights.

Average training hours per employee



Share of employees covered by training programmes, %

2020	2021	2022
48.72	88.06	67.05

The enterprises of TVEL Fuel Company regularly organise industry-wide and divisional training programmes to develop the competences of their managers and employees. Priority personnel development programmes include:

- Succession management programmes: ROSATOM’s Assets, ROSATOM’s Assets. Basic Level, ROSATOM’s Capital, and ROSATOM’s Talents.
- The Global Professionals Programme for the development of future globalisation players.
- The New ROSATOM Products Programme.

Partnership with educational institutions

The Division cooperates with educational institutions under a plan for collaboration with universities and graduates, which is annually updated.

As part of career guidance efforts, the Division organises enterprise tours, meetings with young specialists, and information and development activities for schoolchildren.

Young talent recruitment is a priority in the HR policy of the Fuel Division. The Division expects that it will be able to maintain and strengthen its positions in the field of science and advanced technology by recruiting young professionals.

Cooperation with educational institutions is based on the plan for collaboration with universities and graduates, which is annually updated.

The main areas of cooperation with higher and secondary educational institutions include:

- Long-term planning of requirements for qualified personnel by specialised areas of training (for 2020–2030);
- Provision of information on opportunities for professional development at the Division’s enterprises to students and graduates, promotion of the employer brands of the Division and ROSATOM;
- Organisation of practical training and work placement internship in the Division’s enterprises;
- Implementation of joint educational programmes and special courses at affiliated university departments;
- Organisation of special competitions to select high-potential employees (AtomProfi career marathon);
- Annual participation of young professionals in the AtomSkills industry-wide professional skills competition and the WorldSkills Hi-Tech national competition.
- Development of joint additional professional training programmes on digital twins and additive manufacturing with the MISIS National University of Science and Technology.

In 2022, the KPI target for attracting university graduates to nuclear industry organisations was achieved (160 graduates were hired).

In 2022, 518 students of higher and secondary specialised educational institutions completed internship programmes in the enterprises of the Division, and four graduates were subsequently hired. In 2023, ~671 students are expected to be accepted as interns.

Social programmes

The Division implements nine corporate social programmes:

- Private pension plans;
- Voluntary health insurance;
- Accident and illness insurance;
- Providing better living conditions for employees;
- Health resort treatment for employees and their children, recreation for children;
- Financial assistance to employees;
- Support for retirees;
- Catering;
- Sports and cultural events.

Social programmes implemented by the Division are an important motivation tool. In 2022, the Company spent a total of RUB 1,630 million on social programmes, or RUB 69,700 per employee.

Social expenditure in the Division, RUB million

Programme	2020	2021	2022
Healthcare programmes	240.36	270.28	290.17
Health resort treatment and wellness	89.72	140.31	199.03
Support for retirees	422.64	390.76	550.23
Assistance with the purchase of housing	76.72	74.95	79.10
Private pension plans	135.23	136.42	158.73
Awards policy	-	0.25	0.10
Sports and cultural events	123.39	137.72	156.82
Catering	10.84	11.80	18.97
Financial aid and other types of assistance	81.60	104.38	137.06
Other social expenses	35.52	33.64	40.20
Total	1,216.01	1,300.51	1,630.42

GRI 2-30 Collective bargaining agreements and trade unions

All enterprises of the Fuel Company (except TVEL JSC) have signed collective bargaining agreements covering 100% of their employees (98% of the Fuel Company's average headcount).

Relations with the Russian Trade Union of Nuclear Power and Industry Workers are governed by federal laws of the Russian Federation (Law FZ-10 of 12 January 1996 on Trade Unions, Their Rights and Guarantees of Their Activity) and the Industry-Wide Agreement on Nuclear Power, Industry and Science for 2023–2025.

Human rights

The Fuel Division actively supports and complies with employment standards pursuant to the legislation of the Russian Federation, industry-wide and internal regulations, the Social Charter of the Russian Business and the Industry-Wide Agreement on Nuclear Power, Industry and Science.

The Industry-Wide Agreement on Nuclear Power, Industry and Science and internal regulations of the Fuel Divisions 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 Fuel Division manages labour relations in accordance with the Constitution of the Russian Federation and the Labour Code of the Russian Federation, subject to universally recognised international law principles, providing for non-discrimination in respect of employment and labour law.

In 2022, ROSATOM approved Uniform Industry-Wide Human Rights Policy of ROSATOM and Its Organisations applicable to the Fuel Division.

Each of the Fuel Division's enterprises has an Ethics Board, which is tasked with assessing compliance of actions taken by employees with the Code of Ethics. Any employee in the Division may submit reports or enquiries to the Ethics Board.

GRI 2-26 The Fuel Division supports an open culture of reporting human rights abuses. Employees of the Divisions and representatives of other stakeholders may report cases of non-compliance/violation of human rights or circumstances, which they believe to pose a risk of such non-compliance/violations, and send requests for clarification on human rights protection issues to the e-mail *box info@rosatom.ru* (the message shall be marked 'Human Rights'), as well as to Ethics Committees functioning at the Division's enterprises. Complaints and requests on any issues can be also sent by mail and e-mail to enterprises controlled by the Division. Such reports/requests are handled in accordance with confidentiality and non-discrimination principles. The Fuel Company guarantees that no adverse action will be taken by the Company against whistleblowers on any issue related to the Policy



The background image shows a large industrial workshop. In the foreground, several long, cylindrical metal components, likely fuel rods, are laid out on a metal workbench. These components have a complex, multi-segmented design with various diameters and textures. In the background, there are large industrial machines, possibly CNC lathes or mills, with blue and white painted sections. The floor is a light-colored concrete or polished metal. The overall lighting is bright and even.

9

**DEVELOPING THE REGIONS
OF OPERATION**

10

**SPECIFIC RISKS AND MANAGEMENT
APPROACHES**

**RUB 16.1 BILLION
TAX PAYMENTS OF THE DIVISION**

Fuel for the Chinese fast reactor CFR-600



9 | DEVELOPING THE REGIONS OF OPERATION

GRI 413-1 The Fuel Company implements a number of agreements with the regions of operation as the main mechanism for supporting host towns and cities of its enterprises:
GRI 413-2

1. Cooperation agreements between ROSATOM and regional authorities (signed in 2012), in accordance with which the increase in regional taxes from the operations of nuclear industry enterprises in the region shall be allocated to municipal budgets and used to finance the social and economic development of nuclear cities.

As part of these Agreements, public and courtyard areas in Novouralsk CATF were landscaped, residential houses were built in Pochinok village, social facilities were repaired and improved, and motorways were repaired in 2022. RUB 300 million were allocated to finance these projects. Some of the projects will be further financed in 2023.

In 2022, RUB 250 million were allocated to projects in Glazov, including the relocation of residents from dilapidated houses; maintenance and repair of public spaces; repair of roads, pavements and inter-block passages in the town; repair of social facilities (schools, kindergartens, the Young Technicians Club, etc.); landscaping of the territory of the Gorky Municipal Park, etc. Some of the projects will be further financed in 2023.
2. Agreements between TVEL JSC and regional authorities on implementing initiatives to support national projects in the host towns and cities of the Fuel Company (signed in 2019).

Implementation of agreements with regions in 2022

City	Number of agreements	Financing from the federal and regional budgets, RUB million	Key projects
Seversk CATF	12	227.8	<ul style="list-style-type: none">– Landscaping of public areas;– Purchase of sports inventory;– Creating a Digital Education Centre for children (IT-Cube);– Creating a virtual concert hall;– Repairing roads and roadways;– Providing musical instruments, equipment, educational materials, etc. to art schools for children.
Novouralsk CATF	12	166.7	<ul style="list-style-type: none">– Creating a cooking skills studio;– Setting up a model library;– Purchase of medical equipment for a hospital;– Purchase of sports equipment for the Olympic Reserve School.
Zelenogorsk CATF	6	117.2	<ul style="list-style-type: none">– Relocation of residents from dilapidated housing;– Co-financing municipal programmes to develop modern urban environment;– Creating a virtual concert hall, etc.

City	Number of agreements	Financing from the federal and regional budgets, RUB million	Key projects
Glazov	13	136.8	<ul style="list-style-type: none">– Purchase of musical instruments for Children’s Art School No. 2;– Carrying out construction and installation work at the Centre for Cultural Development;– Landscaping courtyard and public areas,– Creating an IT-Cube centre;– Setting up two workshops in the Glazov Engineering College, etc.
Total	43	648.5	

Results of PSEDA development initiatives in the host towns and cities of the Fuel Company

In 2022, the Fuel Company continued its comprehensive work with the potential and existing residents of PSE-DAs in its host towns and cities (Seversk CATF, Novouralsk CATF, and Glazov).

During the year, a number of round tables, meetings and workshops for local residents, local and regional authorities, business support institutions and ROSATOM representatives were held in cooperation with Atom-TOR JSC, including:

- A round table on the role of preferential territories in the system of the Urals economy was held as part of the INNOPROM-2022 forum in Ekaterinburg and attended by heads of closed administrative territorial formations and representatives of PSEDAs in the Urals region;
- A round table to present the investment potential of Glazov PSEDA;
- A round table on nuclear towns and cities arranged by Atom-TOR JSC at Tomsk Polytechnic University and attended by representatives of the regional government, the administration of Seversk CATF, SCP JSC, the Centre for Innovative Development of the Tomsk Region, and Innohub LLC;
- A round table ‘Nuclear towns and cities. From Human Potential to Territorial Development’ in Ekaterinburg.

In November 2022, Atom-TOR JSC jointly with TVEL JSC held a series of online strategy workshops titled ‘PSE-DAs as Drivers of Territorial Development’ and attended by representatives of PSEDAs, executive authorities, organisations and institutions responsible for business support and development, the Division’s enterprises, and residents of PSEDAs.

Atom-TOR JSC also signed cooperation agreements with:

- the administration of Zelenogorsk CATF in the Krasnoyarsk Territory (on cooperation in the development of investment potential of the CATF, including the establishment of a priority social and economic development area);
- Development Corporation of the Udmurt Republic;
- the Mayor of Glazov.

The Division’s PSEDAs have held leading positions in the nuclear industry by the number of registered residents, jobs created and investments attracted for several consecutive years.

The following results have been achieved since the establishment of PSEDAs by the Fuel Company:

- 62 resident companies have been registered and 64 agreements have been signed;
- 1,880 new jobs have been created;
- RUB 3,634.6 billion of investments have been attracted.

Dialogue forums and other public events initiated by TVEL JSC in the regions of operation in 2022

City	Date	Events
Novouralsk CATF	1-5 August 2022	The second Radius of Trust divisional forum of local communities. During the project marathon at the Forum, delegates from Glazov, Zelenogorsk, Seversk, Novouralsk, Elektrostal, Angarsk, and Neman presented more than 50 projects of urban communities. More than 270 participants.
Neman	4 September 2022	TVEL Town Day in Neman. The festival was attended by performance groups and public activists from all of the Division’s host towns and cities.
Glazov	23-25 November 2022	All-Russian Research-to-Practice Conference on Key Theoretical and Practical Issues of Social Education of the Younger Generation in Russia (470 participants from 18 cities)

Joint projects with non-profit organisations on socially important issues

The Children’s Foresight educational project

The project has been implemented in cooperation with the Agency for Strategic Initiatives (ASI) in the host towns and cities of the Fuel Company since 2019. The Project provides schoolchildren with opportunities to implement socially important initiatives in their cities. In 2022, Elektrostal and Novouralsk joined the Project. In late 2022, the Project was completed in Seversk. In 2022, a total of 250 pupils and 94 specially trained teachers took part in the Project. They presented 49 project ideas and implemented 23 projects.

Out of 97 participants of the Children’s Foresight All-Russian Thematic Shift at the Orlyonok Russian Children’s Centre, who were selected on a competitive basis, 27 children represented host towns of the Fuel Company, in which the Project was implemented.

Element of the Future Children’s Technology Festival

Children keen on engineering professions and teachers from Glazov, Novouralsk, Zelenogorsk, Seversk, Neman and Elektrostal took part in the festival held in Glazov. The project is implemented under a cooperation agreement between the Kurchatov Institute National Research Centre and TVEL JSC.

The Radius of Trust Forum of Local Communities in the Host Towns and Cities of TVEL JSC

The second Radius of Trust Forum of Local Communities in the Host Towns and Cities of TVEL JSC was held in Novouralsk CATF. Delegates from the host towns and cities of the Fuel Company presented more than 50 projects for the development of local communities.

Charitable activities and social projects

In the reporting year, the Company continued to support ten AtomClasses opened in the host towns and cities. In addition, School No. 15 named after V.N. Rozhdestvensky (Glazov) joined the ROSATOM School industry-wide project

In 2022, TVEL JSC allocated more than RUB 428 million to charity and social projects.

Based on results of the social project competition, TVEL JSC allocated nearly RUB 33 million to support 18 projects of neighbourhood communities, 13 projects of hobby communities, and 5 projects of communities based on the same generation, family status, etc. The main theme of the 2022 competition was the support of local communities.

In 2022, TVEL JSC held the first School Fellowship competition in best practices used by educational institutions to engage their graduates in the host towns and cities of the Fuel Company.

The Division continued to co-finance projects supported as winners of competitions held by the Russian Ministry of Education as part of national projects, including: IT Cube in Seversk, the purchase of equipment and repairs in the Quantorium children’s science park in Zelenogorsk, hardware and software for the Children’s National Technical Competition in Elektrostal, the Digital Educational Environment project in the Zhilino secondary school (Neman), and the support of the Diagnostics and Consulting Centre in Novouralsk. Based on pre-qualification results, the Glazov Engineering College was included in the Professionalism Federal Project implemented under the State Programme for Education Development.

Under the University of Local Communities educational project, workshops on ‘Writing applications for grants and attracting other local resources. Target capital’ and ‘Good neighbour relations as the driver of regional development in the regions of operation of the Fuel Company’ were held in the host towns and cities.

The Radius of Trust Project.

TVEL JSC initiated and launched the Radius of Trust project in the host towns and cities of its enterprises (Novouralsk, Zelenogorsk, Seversk, and Glazov). The aim of the Project is to build up social capital in the host towns and cities of the Division, to develop civic and patriotic consciousness and a sense of responsibility for the present and future of the people and the country. During the selection process, 104 local and 7 city-wide initiatives were submitted, of which 61 local and 5 city-wide initiatives in four cities were supported. TVEL JSC allocated a total of RUB 176.5 million to co-finance the project.

Social investment level in monetary terms, RUB million¹

2020	2021	2022
1,527	1,382	1,581

Mechanisms used to monitor the effectiveness and efficiency of regional development programmes.

TVEL JSC regularly monitors:

- 1. Implementation of the cooperation agreement between ROSATOM and the regions (the amount of financing and the status of initiatives under the agreement).
- 2. Implementation of agreements between TVEL JSC and the regions on the support of national projects (the amount of financing and the status of initiatives under the agreement).
- 3. The social and political situation in the host towns and cities of the Division’s enterprises (social, political, and labour market indicators, media monitoring, etc.).

The findings are used to develop and adjust the plans for preserving social harmony in the regions of operation.

1. Includes the funding of territorial development programmes financed through the implementation of agreements with the regions; funds allocated from federal and regional budgets for the implementation of initiatives under national projects; the implementation of social and charitable initiatives in culture, sports and healthcare.



10 | SPECIFIC RISKS AND MANAGEMENT APPROACHES

The risk management system (RMS) of the Company is based on continuous monitoring of the external and internal environment and comprehensive analysis of threats and opportunities that affect the achievement of both the economic and social goals of the Company.

The main purpose of risk management is to identify, assess and mitigate the threats that could affect the Company’s performance.

The key objectives of the RMS are:

- timely identification of risks that could affect the achievement of the goals of TVEL Fuel Company;
- maintaining a stable financial environment in TVEL Fuel Company’s organisations with due consideration of risks;
- continuous monitoring of risks and control over the implementation of action plans to reduce the likelihood of risks and minimise the consequences of their possible occurrence.

The Risk Management System of TVEL Fuel Company is built and optimised in accordance with the most advanced global practices, principles and approaches.

Participants of Division risk management processes and their roles

CRMS	Roles of RMS participants in the risk management process
President of TVEL JSC	<ul style="list-style-type: none">– Approval of the Company’s risk management policy;– Approval of the list of key risks;– Appointment of key risk owners and allocation of responsibility for risk management;– Approval of individual risk limits, strategies and programmes of managing individual risks;– Consideration of issues related to the distribution of authority and responsibility for managing individual risks.
Risk owners (responsible for risk management)	Identification and assessment of individual risks, development of risk factors and key risk indicators (KRI), development and implementation of risk management programmes.
Risk Officer of TVEL JSC	Organisation and methodological support of the risk identification process, organisation and methodological support of the risk management procedures development process.

The analysis of risks affecting the achievement of financial and economic targets by TVEL JSC and the companies controlled by TVEL Fuel Company is carried out at the budgeting and medium-term planning stage, at the stage of monitoring and forecasting the execution of budgets and plans, and in connection with adopting strategic management decisions or choosing the best approaches to implementing key projects.

Key risks of the Division

Risks	Risk management mechanisms
Risk of a decrease in sales of NFC products/services	<ul style="list-style-type: none">– Improving the technical and economic characteristics of fuel; introducing new types of fuel;– Promoting products in new market segments.
Risk of a failure by external counterparties (suppliers and buyers) to perform their contractual obligations in full and on schedule	<ul style="list-style-type: none">– Stipulating payment methods and/or types of collateral in contracts to reduce credit risks;– Monitoring the counterparties’ financial position in order to detect any changes in the financial position of the counterparty entailing a change in the credit risk level and/or the nature of credit risk management procedures;– Qualification of counterparties using non-financial parameters.
Risk of an increase in the cost of fabrication, enrichment and conversion services	<ul style="list-style-type: none">– Cooperation with suppliers based on the principles of the Uniform Industrial Procurement Standard of ROSATOM;– Implementation of the ROSATOM Production System;– Implementation of long-term programmes and investment projects aimed at optimising the technology and production processes;– Development and implementation of performance improvement programmes in all enterprises of the Company;– Implementation of the cost management framework and appointing persons responsible for specific costs;– Long-term forecasting of the balance between the needs and capacities of the enterprises (jointly with ROSATOM and related Divisions of ROSATOM);– Inventory optimisation and faster inventory turnover.
Nuclear and radiation safety risks	<ul style="list-style-type: none">– Upgrading and automating the facilities and ensuring their safe operation;– Decommissioning the facilities of TVEL Fuel Company posing nuclear and radiation hazards and addressing the nuclear legacy issue using funds allocated under the FTP NRS 2 programme and industry reserves;– Personnel training and development;– Continuous monitoring of nuclear and radiation safety;– Setting and achieving the goals and objectives and developing measures to reduce nuclear and radiation safety risks;– Conducting comprehensive reviews and inspections.
Environmental safety risk	<ul style="list-style-type: none">– Setting the goals and objectives and developing measures to reduce environmental and occupational health and safety risks;– Considering draft environmental regulations. Explaining regulatory compliance practice;– Taking occupational safety measures financed with ROSATOM’s special reserve funds;– Holding emergency response drills and personnel training, sharing information for out-of-schedule emergency preparation;– Conducting comprehensive reviews, inspections and audits, environmental monitoring;– Improving the integrated environmental (ISO 14001:2004) and occupational health and safety (ISO 45001:2018) management system.

Risks	Risk management mechanisms
Occupational health and safety risk	<ul style="list-style-type: none">– Improving safety culture, promoting safe behaviour, introducing best practices;– Taking injury prevention measures;– Promoting safe work;– Providing collective and personal protective equipment to employees;– Conducting comprehensive reviews, inspections and audits;– Setting the goals and objectives and developing measures to reduce occupational health and safety risks;– Planning occupational health and safety costs in accordance with the Industry-Wide Agreement;– Improving the Corporate environmental management system (ISO 14001:2015) and the Corporate occupational health and safety management system (ISO 45001:2018).
Industrial safety risk	<ul style="list-style-type: none">– Holding emergency response drills;– Conducting comprehensive reviews and inspections;– Certification of external emergency rescue teams for rescue operations;– Setting the goals and objectives and developing measures to reduce industrial safety risks;– Allocating funds and resources and arranging civil liability insurance;– Improving the integrated occupational health and safety, environmental and industrial safety management system (ISO 14001: 2004; ISO 45001:2018).
Social and political risks	<ul style="list-style-type: none">– Implementing action plans to mitigate social and political risks in the regions of operation;– Interacting with regional and municipal governments to promote regional development, increase regional tax revenue and maintain social and economic stability in the regions;– Implementing social and charity initiatives in the host towns and cities of TVEL Fuel Company;– Building a system of multi-level internal (including on a cascade basis) and external communications;– Holding public dialogue forums in TVEL Fuel Company’s regions of operation.
Reputational risk	<ul style="list-style-type: none">– Ensuring compliance with the industry-wide regulation on informing the public of emergencies posing threats to ROSATOM’s business and public reputation;– Implementing the Unified Information Policy of the Division;– Ensuring integrated communications;– Implementing target communication programmes to promote products and services of TVEL JSC and its subsidiaries;– Developing a value-based corporate culture and implementing the Promotion of ROSATOM’s Values Among the Public project;– Stimulating the activity of municipal communication and conciliation commissions;– Implementing a communication campaign to minimise risks of negative publications about DUHF imports into the Russian Federation.



APPENDICES

APPENDIX 1. INFORMATION ON THE REPORTING PROCESS

The reporting process involved a review of the operations of the Fuel Division of ROSATOM in 2022. The report discloses the prospective development areas, the main performance indicators of the Division, and information on measures providing a framework for long-term sustainable development.

The report includes information on the performance of TVEL JSC and its subsidiaries.

GRI 2-2 The consolidation perimeter for the report includes the following companies: TVEL JSC, AECP JSC, VNIINM JSC, EC RGC JSC, KMZ PJSC, MZP JSC, MSZ JSC, NCCP PJSC, NPO Centrotech LLC, United Company ESC JSC, Industrial Innovations JSC, SCP JSC, VPO Tochmash JSC, UEIP JSC, UEC JSC, CMP JSC, Ecoalliance LLC, PA ECP JSC, TSPTI JSC, ELEMASH MAGNIT LLC, Rusatom MetallTech LLC, RusWellGroup JSC, RWG-TP LLC, Centrotech Engineering LLC and others. Data on actual tax expenses and other charges paid in the Russian Federation does not include the expenses of the following foreign entities: NUKEM Technologies GmbH, Nukem Technologies Engineering Services GmbH.

TVEL Fuel Company prepares its reports in accordance with GRI 2021 Sustainability Reporting Standards of the Global Reporting Initiative.

GRI 2-4 There are neither restatements of data nor significant changes in the scope and boundaries of topics covered in the report as compared to previous reports. The period covered by the report is limited to 2022 calendar year.

GRI 2-29 In the process of report preparation, the Company conducted a questionnaire survey among stakeholders to identify significant environmental and social impacts of its operations. The survey identified the following material issues to be disclosed in the report:

- GRI 3-1**
- Outcomes of the digital transformation of the Fuel Division;
 - Innovation and science development;
 - Environmental impact of the Division;
 - Contribution to the development of the regions of operation and technological sovereignty of the Russian Federation.

Draft report of TVEL JSC for 2022 prepared in accordance with stakeholder recommendations was presented during public consultations on 15 May 2023. The consultations resulted in a number of stakeholder proposals on disclosures in the report.

APPENDIX 2.
GRI CONTENT INDEX

Statement of use	TVEL JSC has reported in accordance with the GRI Standards for the period from 1 January through 31 December 2022.
GRI 1 used	GRI 1: Foundation (2021)
Applicable GRI Sector Standard(s)	Not applicable

GRI Standard/ Other source	Indicator	Report section	Comments
General Disclosures			
GRI 2: General Disclosures (2021)	2-1 Organisational details	2. Overview of the Division, pp. 5-8 3. Governance system, pp. 8-10	
	2-2 Entities included in the consolidation perimeter	Appendix 1. Information on the Reporting Process, p. 52	
	2-3 Contact point	Contact Details, p. 63	
	2-4 Restatements of information	Appendix 1. Information on the Reporting Process, p. 52	
	2-5 External assurance	–	There is no external assurance
	2-6 Activities, value chain and other business relationships	2. Overview of the Division, pp. 5-8	
	2-7 Employees	8. Developing the Human Capital, p. 39	
	2-8 Workers who are not employees	8. Developing the Human Capital, p. 39	
	2-9 Governance structure and composition	3. Governance system, p. 8	
	2-10 Nomination and selection of the highest governance body	3. Governance system, p. 8	

GRI Standard/ Other source	Indicator	Report section	Comments
GRI 2: General disclosures (2021)	2-11 Chair of the highest governance body	3. Governance system	The Chair of the Board of Directors does not simultaneously act as the chief executive officer.
	2-12 Role of the highest governance body in overseeing the management of impacts	3. Governance system	The Federal Law on Joint Stock Companies does not assign the functions of supervising the management of the organisation’s impact on the economy, environment and people and conflict prevention functions to the Board of Directors.
	2-13 Delegation of responsibility for managing impacts	3. Governance system	
	2-14 Role of the highest governance body in sustainability reporting	Appendix 1. Information on the Reporting Process, p. 52	
	2-15 Conflicts of interest	3. Governance system	Issues related to the resolution of conflicts of interest are governed by the Regulation approved by Order 4/420-P of 17 August 2020 on Approval and Enactment of the Regulations on the Commission for Compliance with Requirements for Professional Conduct and Resolution of Conflicts of Interest in TVEL JSC and the Procedure for Preventing Any Possibility of a Conflict of Interest by Employees of TVEL JSC. If a member of the Board of Directors simultaneously serves on governing bodies of other companies (cross-board membership), such director shall not vote on matters related to the approval of transactions with these companies, provided that the director is considered to be interested in the transaction pursuant to the Federal Law on Joint-Stock Companies.
	2-16 Communication of critical concerns	3. Governance system	The Federal Law on Joint Stock Companies does not assign the functions of supervising the management of the organisation’s impact on the economy, environment and people and conflict prevention functions to the Board of Directors. There were no critical concerns about economic, environmental and social impact, including stakeholder complaints, in the reporting period.
	2-17 Collective knowledge of the highest governance body	3. Governance system, p. 9	
	2-18 Evaluation of the performance of the highest governance body	3. Governance system	There has been no evaluation of the Board’s performance.

GRI Standard/ Other source	Indicator	Report section	Comments
GRI 2: General Disclosures (2021)	2-19 Remuneration policies	3. Governance system	No decisions were taken in 2022 to pay any remuneration and/or reimburse expenses incurred by the directors of TVEL JSC; no remuneration was paid, and no expenses were reimbursed. Board members who are full-time employees of TVEL JSC are remunerated for their work in accordance with the Standardised Industry-Wide Remuneration System. Remuneration paid to Board members, including salary, is regulated by employment contracts and applicable local regulations of the Company/ROSATOM on remuneration. According to a 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 directors. The amount of such remuneration and reimbursement is established by the General Meeting of Shareholders.
	2-20 Process to determine remuneration	3. Governance system	In accordance with the requirements of the Standardised Industry-Wide Remuneration System and the Uniform Industry-Wide Performance Management Policy, the amount of the annual bonus depends on achieving KPI targets and reflects progress in achieving the key performance targets of the Division 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.
	2-21 Annual total compensation ratio	3. Governance system	
	2-22 Statement on sustainable development strategy	3. Governance system, pp. 9, 12, 13	
	2-23 Policy commitments	3. Governance system, p. 8 4. Innovation and Development of Science, p.14 6. Safety of Operations, pp. 26, 28, 32 7. Digitisation, p.32 8. Developing the Human Capital, pp. 37-39 9. Developing the Regions of Operation, pp. 44-48 10. Specific Risks and Management Approaches, p. 49	

GRI Standard/ Other source	Indicator	Report section	Comments
GRI 2: General Disclosures (2021)	2-24 Embedding policy commitments	3. Governance system, p. 8 4. Innovation and Development of Science, p.14 6. Safety of Operations, pp. 26, 28, 32 7. Digitisation, p.32 8. Developing the Human Capital, pp. 37-39 9. Developing the Regions of Operation, pp. 44-48 10. Specific Risks and Management Approaches, p. 49	Availability of the Policy to stakeholders is ensured by posting it on the websites of the Division’s organisations, as well as by sending the Policy upon request to any stakeholder.
	2-25 Processes to remediate negative impacts	3. Governance system, p. 14 6. Safety of Operations, p. 29	The Division operates a multi-channel hotline.
	2-26 Mechanisms for seeking advice and raising concerns	3. Governance system 8. Developing the Human Capital, p. 43	Included in the functions of the Asset Protection Department and the HR Department. As for complaints addressed jointly with the legal function, the Legal and Corporate Affairs Department monitors timely execution of instructions issued by regulators and provides legal support of litigation, if a decision on challenging a complaint is made.
	2-27 Compliance with laws and regulations	3. Governance system	In the reporting year, the key organisations of the Division did not commit any material violations of laws or regulations, which would result in the imposition of fines by competent authorities, in the course of their core business activity.
	2-28 Membership associations	3. Governance system	TVEL JSC is a member of the following external organisations: SoyuzAtomStroy SRO, Nuclear Cities Union, SoyuzAtom of Russia, National Nuclear Innovation Consortium, Defence Enterprises Support League, National Association of Procurement Institutions, Atom-Sport Autonomous Non-Profit Organisation, and Energy of Development Autonomous Non-Profit Organisation.
	2-29 Approach to stakeholder engagement	3. Governance system, p. 13 Appendix 1. Information on the Reporting Process, p. 52	

GRI Standard/ Other source	Indicator	Report section	Comments
GRI 2: General Disclosures (2021)	2-30 Collective bargaining agreements	8. Developing the Human Capital, p. 43	
Material topics			
GRI 3: Material Topics 2021	3-1 Process to determine material topics	Appendix 1. Information on the Reporting Process, p. 52	
	3-2 List of material topics	Appendix 1. Information on the Reporting Process, p. 52	
Outcomes of the digital transformation of the Fuel Division			
GRI 3: Material Topics 2021	3-3 Management of material topics	7. Digitisation, pp. 32-37	
Contribution to the technological sovereignty of the Russian Federation			
GRI 3: Material Topics 2021	3-3 Management of material topics	5. Contribution to the technological sovereignty of the Russian Federation, pp. 22-25	
Developing the Regions of Operation			
GRI 413: Local Communities (2016)	413-1 Operations with local community engagement, impact assessments, and development programmes	9. Developing the Regions of Operation, pp. 44-49	
	413-2 Operations with significant actual and potential negative impacts on local communities	9. Developing the Regions of Operation, pp. 44-49	
Environmental impact (waste, consumption of water and energy, etc.)			
GRI 3: Material Topics 2021	3-3 Management of material topics	6. Safety of Operations, p. 26	
GRI 302: Energy (2016)	302-1 Energy consumption within the organisation	6. Safety of Operations, p. 28	
	302-4 Reduction of energy consumption	6. Safety of Operations, p. 28	
GRI 303: Water and Effluents (2018)	303-1 Interactions with water as a shared resource	6. Safety of Operations	There are no significant negative impacts.

GRI Standard/ Other source	Indicator	Report section	Comments
	303-2 Management of water discharge-related impacts	6. Safety of Operations, p. 29	
	303-3 Water withdrawal	6. Safety of Operations, p. 29	
	303-4 Water discharge	6. Safety of Operations, p. 29	
GRI 305: Emissions (2016)	305-7 Nitrogen oxides (NOx), sulphur oxides (SOx), and other significant air emissions	6. Safety of Operations, p. 30	
GRI 306: Waste (2020)	306-1 (2020) Waste generation and significant waste-related impacts	6. Safety of Operations, p. 29	
	306-2 (2020) Management of significant waste-related impacts	6. Safety of Operations, p. 29	
	306-3 (2020) Total weight of waste generated and a breakdown of this total by composition of the waste	6. Safety of Operations, p. 29	
Innovation and science development			
GRI 3: Material Topics 2021	3-3 Management of material topics	4. Innovation and Development of Science, pp.14-22	

APPENDIX 3. GLOSSARY AND ABBREVIATIONS

Term/ abbreviation	Definition
BWR	Boiling water reactor, a tank-type reactor that uses boiling water as a coolant
CATF	Closed administrative and territorial formation
CFR	Functional responsibility centre
Computer	Electronic computing machine
CRMS	Corporate risk management system
EBITDA	Earnings before interest, taxes, depreciation and amortisation
FE NFC	Front end of the nuclear fuel cycle
FMBA	Federal Medical and Biological Agency
FSUE	Federal State Unitary Enterprise
FTP	Federal target programme
GC	Gas centrifuge
IAEA	International Atomic Energy Agency, an international supervisory agency, which monitors nuclear safety and non-proliferation of nuclear weapons across the globe
KPI	Key Performance Indicators
LTIFR	Lost time injury frequency rate, number of lost time injuries / man-hours worked in the reporting year × 1 million man-hours
MNUP	Mixed uranium-plutonium nitride fuel
MOX fuel	Mixed Oxide Fuel, nuclear fuel, usually based on the mix of uranium and plutonium oxides
NF	Nuclear fuel
NFA	Nuclear fuel assembly

NFC	Nuclear fuel cycle, a sequence of manufacturing processes supporting the functioning of the nuclear power industry, including uranium ore mining and processing, fuel fabrication, transportation of fuel to NPPs, and the storage and reprocessing of spent nuclear fuel
NFE	Nuclear fuel element
NPO	Research and production association
NRS	Nuclear and radiation safety
PDEF	Pilot and Demonstration Energy Facility
PHWR	Pressurised heavy water reactor, a foreign design reactor that uses heavy water (D2O) as a coolant
PSEDA	Priority social and economic development area
PWR	Pressurised water reactor, a foreign-design reactor that uses light water maintained under high pressure as a coolant (similar to VVER)
R&D	Research and development activities
RAW	Radioactive waste
RBMK	High-power channel-type reactor, a direct-cycle nuclear power reactor that uses light water as a coolant and graphite as a moderator
RPS	ROSATOM Production System
RU	Reactor unit
SNF	Spent nuclear fuel
SRC	State Research Centre
SSP	Sublimation separation plant
TVSA	Alternative design fuel assembly
TVS-KVADRAT	Brand name of a nuclear fuel assembly designed in Russia for PWR reactors
VVER	Water-cooled water-moderated power reactor

GRI 2-3 **Contact Details**

TVEL Joint Stock Company (TVEL JSC)

E-mail: info@tvel.ru
Registered address: 24 Bolshaya Ordynka Street, Moscow, 119017
Contact phone: +7 495 988-8282
Mail address: 49 Kashirskoye Shosse, Moscow, 115409

Communications Department
E-mail: NaVSlavinskaya@tvel.ru



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rosatom.ru