ROSATOM

PERFORMANCE OF THE MINING DIVISION IN 2020

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Statement from the Head of the Division

Dear colleagues and partners,

2020 was marked by notable events – first of all, the 75th anniversary of the Victory in the Great Patriotic War and the anniversary of the nuclear industry. But it was also the first year of the pandemic that changed everyday life and became a test of strength for all of us, including for ARMZ Uranium Holding. The past year proved that the Mining Division employs true, dedicated professionals, who are not afraid of difficulties and, no matter the odds, work to get things done.

While major mining enterprises suspended their work and reduced their production volumes, production in ARMZ Uranium Holding reached 103% of the target. The nuclear industry got 2,850 tonnes of strategic metal.

The Division is rapidly developing uranium production using the most effective in-situ leaching method. In 2020, the share of uranium mined using the in-situ leaching method at Khiagda JSC and Dalur JSC reached 56% of the total production volume.

The development of uranium assets was accompanied by continued systematic development of uranium deposits. In 2020, Khiagda JSC completed the construction of and prepared for commissioning the sites at the Vershinnoye deposit. In the reporting year, Dalur JSC completed geological exploration at the Dobrovolnoye deposit and started the construction of a pilot industrial uranium in-situ leaching site.

PIMCU, PJSC implemented in full the infrastructure construction programme for Mine No. 6 for 2020.

We continued to develop non-uranium businesses – to form future assets of the Division. The past year was in many respects decisive for JSC Atomredmetzoloto's long-term perspective, and that is why the priority topic of the report is *The Mining Division's business diversification as a sustainable development factor.*

In 2020, the share of revenue from non-uranium projects for the first time reached almost 30% of the Division's total revenue. It was primarily ensured by execution of the brown coal export contracts (ARMZ Service LLC) and the housing and utilities infrastructure modernisation projects in the Chukotka Region (Elkon MMP JSC). VNIPIPT JSC engineering centre and RUSBURMASH JSC service company showed high performance results, having increased their revenue from external projects severalfold (by 140% and 223% respectively). Such work performed amid the pandemic is a genuine breakthrough evidencing the high level of competencies and expertise of the Holding's employees.

The Scandium project was brought to a commercial level, with 366 kilograms of scandium oxide sold in the reporting year. We continue to work on the project for development of the Pavlovskoye lead and zinc deposit in the Arctic region.

The Division is developing gold ore deposits, acquired another licence for gold production in the Chukotka Region (the Sovinoye deposit), and is continuing to develop the Severnoye deposit.

ARMZ Mining Machinery LLC successfully commenced the assembly and sales of mining equipment.

It should be noted that during the implementation of all projects we ensure a balance between achieving production goals and protecting the life and health of employees. Thanks to the highest level of responsibility of its personnel, ARMZ Uranium Holding is able to contribute significantly to the strengthening of ROSATOM's position in the world uranium market and feel confident about the future.

Vladimir Verkhovtsev
Head of the Mining Division,
Director General of JSC Atomredmetzoloto,
the Division's holding company

Fighting the Pandemic

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Amid the COVID-19 pandemic, JSC Atomredmetzoloto, uranium mining and service enterprises did not stop work for a single day. Production targets for uranium mining, development of new businesses and external revenue for 2020 were exceeded.

The achieved indicators are attributable to the efforts of all personnel of the Mining Division. All employees of ARMZ Uranium Holding enterprises and members of their families strictly observed the sanitary and epidemiological requirements, and the provisions of the relevant ROSATOM orders. This is what made it possible to preserve the life and health of employees and the population in the regions of operation.

Among the measures to ensure the social and epidemiological well-being of employees taken at all ROSATOM enterprises, the main one was the strict observance of the mask regime. The sanitary and epidemiological regime was strengthened in the premises of departments and at production sites. Hourly cleaning and surface treatment was organised. In all rooms, the high-quality functioning of ventilation and dust suppression systems is ensured, ventilation and air disinfection are organised using recirculators. The vehicles used for the delivery of personnel are also constantly disinfected.

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Work schedules were formed so as to minimise contact between employees and to separate work streams. In particular, at Khiagda JSC, where the rotation shift method is used, the duration of a shift was increased, and employees underwent strict quarantine before entering the industrial site. The body temperature of employees was measured with non-contact devices at the entrances and exits of buildings, and, where necessary, during the working day. Third parties were prohibited from entering all premises and all production sites. PIMCU, PJSC was able to quickly organise the production of antiseptics and medical oxygen to supply to medical institutions in the Zabaykalsky Territory and organisations in Krasnokamensk.

Employees aged 65 and older, employees with chronic diseases, pregnant women and employees with disabilities were told to work remotely. Business trips of employees were significantly reduced, mass events, including meetings, were excluded (held in video format). All employee training was transferred to a remote format using video communication capabilities.

The management of ARMZ Uranium Holding is doing everything possible to ensure that those who fall ill with COVID-19 receive high-quality and timely medical care. For example, assistance in the acquisition of protective equipment and medicines was constantly provided to medical institutions in the regions of operation. In particular, assistance in organising testing for coronavirus and mass vaccination was provided to medical unit No. 107 of the Federal Biomedical Agency of Russia and Regional Hospital No. 4. Protective suits and shoe covers, skin antiseptics, pulse oximeters (devices for non-invasive measurement of blood oxygen saturation), air recirculators, non-contact thermometers and other medical products were purchased and donated to doctors. The medical unit and the hospital received equipment for storing and transferring the COVID-19 vaccine – a refrigeration unit and insulated containers. Rapid tests for COVID-19 were also procured.

Due to the adverse epidemiological situation and in order to monitor the emotional state of employees, employee pulse surveys were conducted on a quarterly basis throughout 2020, the task of which was to understand the effectiveness of the measures taken and develop new tools to support employees in the pandemic. Throughout the period, more than 650 people shared their views on how to improve work during the COVID-19 pandemic. According to the results of each survey, the enterprises of the Division developed, approved and implemented action plans. One of the notable examples of supportive measures implemented were videos featuring the enterprises' top management, aimed at promoting the rules for combating the virus.

Chapter 1

OVERVIEW OF THE MINING DIVISION

1.1 General

Core business areas

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The Mining Division of State Atomic Energy Corporation Rosatom (its holding company is JSC Atomredmetzoloto) is one of the largest producers of natural uranium in the world.

The Division manages the Russian uranium mining assets located in the Zabaykalsky Territory (PIMCU, PJSC), the Republic of Buryatia (Khiagda JSC), and the Kurgan Region (Dalur JSC).

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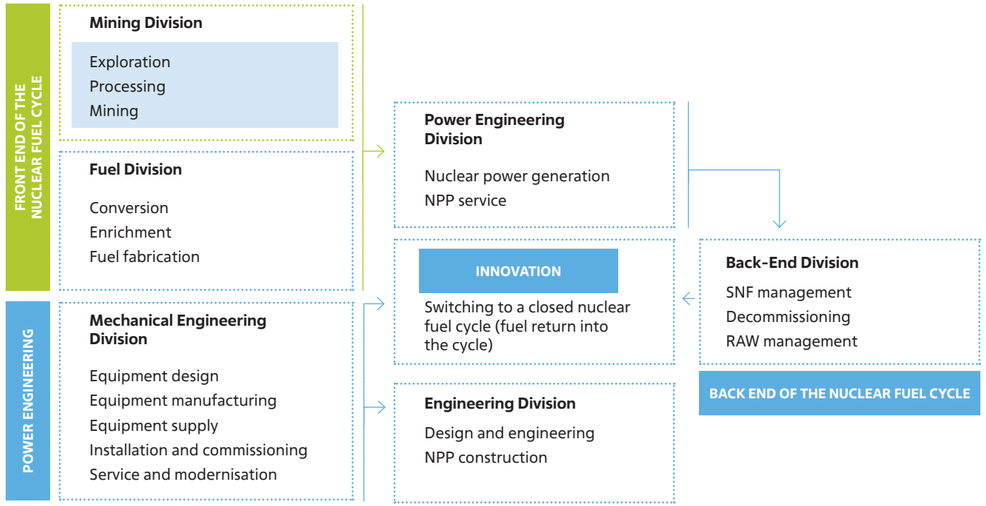
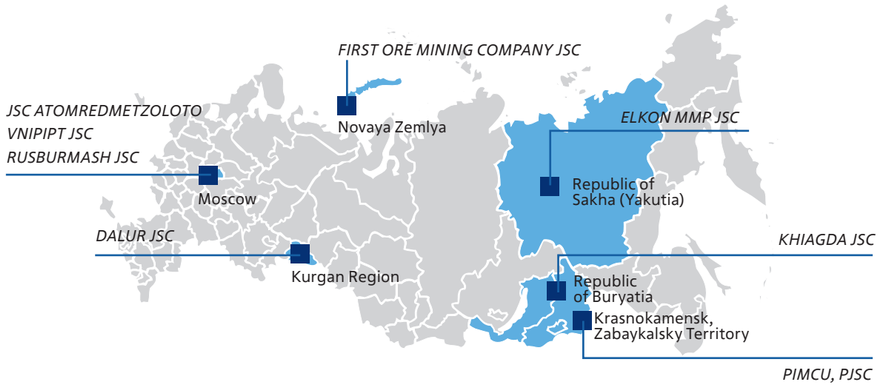
JSC Atomredmetzoloto in ROSATOM's structure



In addition to uranium mining, the Division is also actively developing non-uranium businesses, including extraction of scandium as a by-product (Dalur JSC), brown coal mining (PIMCU, PJSC), designing an industrial facility at the Pavlovskoye lead and zinc deposit, gold ore deposits development projects (Elkon MMP JSC), etc.

Having unique competences in the field of uranium production, the Division's enterprises perform a full range of operations: from geological exploration, pilot and design work to reclamation and decommissioning of production facilities.

JSC Atomredmetzoloto assets map



Natural uranium market overview and outlook

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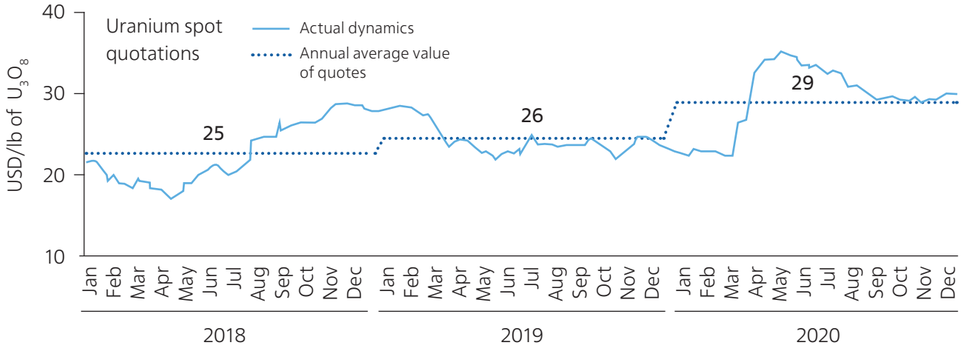
Natural uranium market in 2020

Global demand for uranium taking into account NPP reactor needs, as well as commercial and strategic stockpiling	69,600 tonnes
Global supply of uranium	72,300 tonnes *
Global natural uranium production	47,500 tonnes
Average spot quotations	USD 29.5 / lb of U_3O_8

** Including 24,800 tonnes ensured by uranium supplies from secondary sources*

In the first months of 2020, the spot uranium market volatility remained low: from the beginning of January until mid-March, the spot prices were in the range of USD 24 to 25 /lb of U_3O_8. However, starting from the second fortnight of March, the COVID-19 pandemic had a direct impact on the uranium market. As major uranium mining companies (Cameco, NAC Kazatomprom) announced a suspension or curtailment of production due to the risk of spread of coronavirus, in March and April 2020, prices and volumes traded on the spot market soared unprecedentedly. The spot price peaked in late May, having passed the USD 34/lb of U_3O_8 mark for the first time since February 2016. Starting from June, the quotations gradually retreated as quarantine restrictions were relaxed. Nevertheless, as a number of uranium mining enterprises resumed operations by the end of the year, the spot prices started growing again. In the reporting year, spot market quotations averaged USD 29.5/lb of U_3O_8 (according to UxC*), up by 14% year on year.

Uranium spot quotation dynamics in 2018 – 2020, USD/lb of U_3O_8

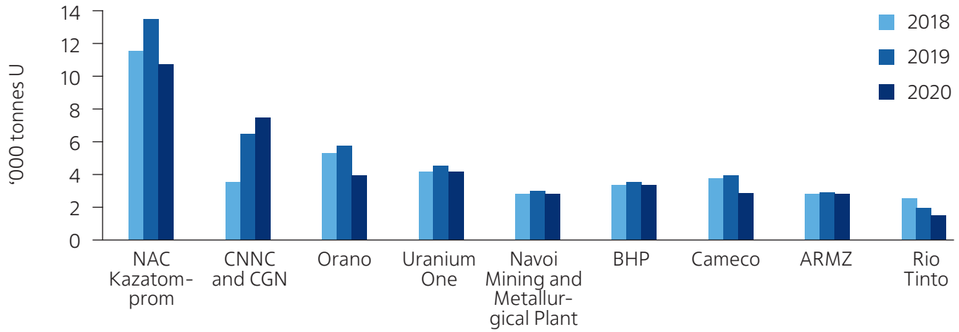


Source: input data from UxC; average values have been calculated by JSC Atomredmetzoloto.*
**UxC, LLC is an independent international company specialising in market analysis, research and forecasting covering the entire nuclear fuel cycle. Established in 1994. Website: https://www.uxc.com/.*

Global uranium production in 2020

In 2020, as a result of quarantine restrictions introduced due to the COVID-19 pandemic, global uranium production fell by 13% year on year to 47,500 tonnes. NAC Kazatomprom has been the largest uranium mining company globally since 2010 (23% of global production according to 2020 results). ROSATOM, including JSC Atomredmetzoloto and JSC Uranium One Group enterprises (shown separately), produced 7,100 tonnes of uranium in 2020, which makes up about 15% of the global production (4th in the global ranking). Amid production curtailment by major competitors, in 2020, ROSATOM ranked second in terms of global natural uranium production.

Major uranium producers in 2018–2020, '000 tonnes



Sources: company reports and press releases, UxC, JSC Atomredmetzoloto assessment. Production volume is taken into account proportionately to ownership interests[1].

Membership in organisations and associations

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ARMZ seeks to comply with and implement in its activities the best industry practices in the field of sustainable development, including the key principles of the World Nuclear Association, of which it is a member.

External charters, principles and other initiatives

The Division's activities comply with the principles of the Social Charter of Russian Business.

[1] Data on Cameco is provided taking into account the company's share in the production volume of Inkai Joint Venture.

Uranium resource base development

As at January 1, 2021, the uranium mineral resource base (MRB) of JSC Atomredmetzoloto totalled 509,400 tonnes.

Reserves and resources of the Russian enterprises of ARMZ Uranium Holding as at January 1, 2021, '000 tonnes

Enterprise	Reserves	P_1 resources	Total MRB
PIMCU, PJSC	96.6	-	96.6
Dalur JSC	12.7	8.1	20.8
Khiagda JSC	33.5	1.4	34.9
Elkon MMP JSC	357.1	-	357.1
Total	**499.9**	**9.4**	**509.4**

The MRB decreased due to the annual depletion of economic reserves as a result of uranium mining totalling 3,300 tonnes.

Exploration works

In 2020, exploration works (EW) were carried out at the Dobrovolnoye uranium deposit (Dalur JSC, Kurgan Region), at the Severnoye gold and uranium deposit (Elkon MMP JSC, Republic of Sakha (Yakutia)) and at the Sovinoye gold deposit (Elkon MMP JSC, Chukotka Autonomous Region).

Total investments into EW amounted to RUB 956.4 million.

Exploration drilling and financing in 2020

Activities	Meterage drilled, '000 linear metres	Amount of financing, RUB million
EW at the Dobrovolnoye deposit (Dalur JSC)	104.3	552.3
EW at the Severnoye deposit (Elkon MMP JSC)	16.7	309.7
EW at the Sovinoye deposit (Elkon MMP JSC)	2.6	94.4
Total	**123.6**	**956.4**

Results in 2020

- Field EW were completed at the Dobrovolnoye deposit. 179 wells were drilled with a total depth of 104,300 linear metres.
- Design documentation and cost estimates were prepared for prospecting at the Severnoye deposit; a positive opinion was obtained from Federal State Institution Rosgeolekspertiza.
- EW were started in the upper oxidised part of the Severnoye gold and uranium deposit. 106 wells were drilled with a total depth of 16,700 linear metres.
- Design documentation and cost estimates were prepared for prospecting and evaluation works at the Sovinoye deposit; a positive opinion was obtained from Federal State Institution Rosgeolekspertiza.
- Prospecting and evaluation works were started at the Sovinoye deposit. 9 wells were drilled with a total depth of 2,600 linear metres.

Plans for 2021

- Continue EW at the Dobrovolnoye deposit (in-office and laboratory works, analytical studies).
- Continue EW at the Severnoye deposit.
- Continue prospecting and evaluation works at the Sovinoye deposit.
- Develop a feasibility study (FS) of temporary operating conditions for PIMCU, PJSC.

1.2 Quality management systems and standards compliance and implementation

The Mining Division pays close attention to customer satisfaction by analyzing incoming complaints and conducting surveys and questionnaires.

Analysis of consumer complaints and requests

Despite the COVID-19 pandemic, in 2020, the Company fulfilled all obligations to customers and continues to strengthen its position in a number of areas in terms of the organisation of the sales and marketing system. During 2020, all products that arrived at the warehouse of Siberian Chemical Plant JSC from the Mining Division were first pass yield. No complaints, claims or reclamations regarding the quality of products were received from consumers.

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Consumer survey results

Supplier satisfaction analysis

Criteria for assessing satisfaction with the quality of interaction	Score by criterion*		
	PIMCU, PJSC	Khiagda JSC	Dalur JSC
Response time	100	100	100
Coordination during the request on any issue	100	110	110
Personal courtesy and professionalism of employees	110	110	110
Timely and complete information on supplies	100	110	100
Timely payment for supplied products	100	100	100

** The score is given in the range from 0 to 110 points for each criterion, where:*
A score from 101 to 110 points means above expectations for this criterion;
A score of 100 points means compliance with expectations for this criterion;
A score from 90 to 99 points means below expectations for this criterion;
A score below 90 points means failure to meet expectations for this criterion.

Analysis of feedback from customers and suppliers

The relations with external stakeholders and customers are maintained on an ongoing basis and in an effective manner.

In order to improve the quality of its products, in 2020, JSC Atomredmetzoloto increased the share of processing of ammonium polyuranate produced by Khiagda JSC into uranium oxide concentrate using the production facilities of PIMCU, PJSC.

In 2020, no claims were received from consumers in respect of the finished products of JSC Atomredmetzoloto, all batches of manufactured products met the technical specifications.

Product conformity

Compliance of JSC Atomredmetzoloto products (services) is confirmed by certificates of conformity for each batch of uranium. The products of the Mining Division enterprises are consumed by the Fuel Division (TVEL JSC).

In 2020, no claims were received from consumers in respect of the finished products of JSC Atomredmetzoloto, all batches of manufactured products met the technical specifications.

Compliance with quality standards

Results in 2020

- JSC Atomredmetzoloto, PIMCU, PJSC and Khiagda JSC underwent a recertification of their quality management systems in accordance with the ISO 9001:2015 and ISO 14001:2015 international standards.
- Dalur JSC, RUSBURMASH JSC and VNIPIPT JSC confirmed that their quality management systems comply with the ISO 9001:2015 requirements.
- At RUSBURMASH JSC and ARMZ Service LLC, an audit of the quality management systems was carried out to assess the quality management system development level. As a result of each audit, reports were prepared for each of the audited companies specifying the identified non-conformities.

Data reliability audit of products, works and services suppliers
In order to increase the level of quality assurance of procured goods, works, services and reduce the risk of missed deadlines when fulfilling contracts, in 2020, nine data reliability audits were conducted in respect of suppliers of critical products procured by organisations to ensure uninterrupted production of finished products.

Quality control in procurement

GRI 103–2

In order to continuously improve the quality management systems in the Mining Division enterprises, as well as to improve quality control in procurement of critical products, construction and installation works, design services for nuclear facilities, and commissioning works, ROSATOM put into commercial operation its Unified Industry-Wide Quality Management System (UIS Quality). For this purpose, 60 contracts with counterparties were supplemented with the provisions on irregularity management using UIS Quality.

ARMZ selects and evaluates suppliers based on the requirements of ROSATOM's Unified Industrial Procurement Standard (Regulations on Procurement).

Plans for 2021

- Improve and develop the quality management system in the Division;
- Perform a systematic analysis of the organisation's activities by means of self-assessment;
- Annually confirm the compliance of management systems with the established requirements;
- Observe the share of participation of small and medium-sized businesses in the procurement of the Division;
- Increase openness and efficiency in the procurement activities of the Division;
- Reduce the time of the procurement process.

GRI 103–2

1.3 Corporate governance system

JSC Atomredmetzoloto applies in practice certain provisions of the Corporate Governance Code recommended by Letter of the Bank of Russia No. 06-52/2463 dated April 10, 2014, taking into account the specifics of ROSATOM's legal status established by regulatory legal acts of the Russian Federation, which provide for single management of nuclear industry entities and are reflected in a number of local regulations of the Company.

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The corporate governance system, being a cornerstone on which JSC Atomredmetzoloto activities are based, is formed on several levels.

The governing bodies include:

- The General Meeting of Shareholders;
- The Board of Directors;
- The General Director (sole executive body).

General Meeting of Shareholders

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The General Meeting of Shareholders is the supreme governing body of JSC Atomredmetzoloto. The competence and the procedure for convening and holding the General Meeting of Shareholders are determined by the provisions of the Company's Articles of Association, as well as regulatory acts of the Russian Federation.

JSC Atomredmetzoloto informs its shareholders in a timely manner of both the General Meeting of Shareholders date and the voting results at the meetings. Relevant messages are posted on the JSC Atomredmetzoloto official website www.armz.ru.

Shareholders of JSC Atomredmetzoloto as at December 31, 2020

Shareholders	Number of shares	Interest in the share capital
JSC Atomenergoprom	23,910,627,871	84.5189%
TVEL JSC	4,055,695,153	14.336%
ROSATOM	323,954,167	1.1451%
Total	**28,290,277,191**	**100%**

Board of Directors

The Board of Directors carries out the general management of the Company's activities and plays a key role in strategic management. In accordance with the Company's Articles of Association, the quantitative composition of the Board of Directors is determined by the General Meeting of Shareholders, but the number of Directors shall be no less than five.

The functions of Chairman of the Board of Directors and the General Director are separated.

The competence of the Board of Directors is determined by the provisions of the Company's Articles of Association, as well as regulatory acts of the Russian Federation.

Members of the Board of Directors do not own shares of JSC Atomredmetzoloto. In the reporting period, no transactions on the acquisition or alienation of the Company's shares by members of the Board of Directors or the Director General were made.

The candidates to the Board of Directors are nominated in accordance with the requirements of Art. 53 of the Federal Law on Joint-Stock Companies.

The Board of Directors of JSC Atomredmetzoloto is convened as necessary by the Chairman of the Board of Directors on his own initiative, at the request of a member of the Board of Directors, the General Director, or an auditor.

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Composition of the Board of Directors of JSC Atomredmetzoloto in 2020:

- Alexander Lokshin – Chairman of the Board of Directors;
- Oleg Barabanov;
- Vladimir Verkhovtsev;
- Vladimir Vysotsky;
- Vladislav Korogodin;
- Alexey Kokorin.

Dynamics of JSC Atomredmetzoloto Board of Directors meetings in 2018–2020

Year	2018	2019	2020
Number of meetings	29	26	14
Number of agenda items considered	35	35	19

All meetings of the Board of Directors in 2020 were held by absentee voting.

The number of agenda items considered by the Board of Directors in 2020 decreased as compared to previous years due to the adoption in March 2020 of the new standard version of the Articles of Association of JSC Atomredmetzoloto developed by ROSATOM, according to which certain matters were excluded from the Board of Directors' competence for the purpose of optimising the activities of governing bodies.

The pandemic did not affect corporate governance at JSC Atomredmetzoloto.

All corporate events were carried out in a timely manner.

General Director

The General Director is the sole executive body managing the Company's day-to day business.

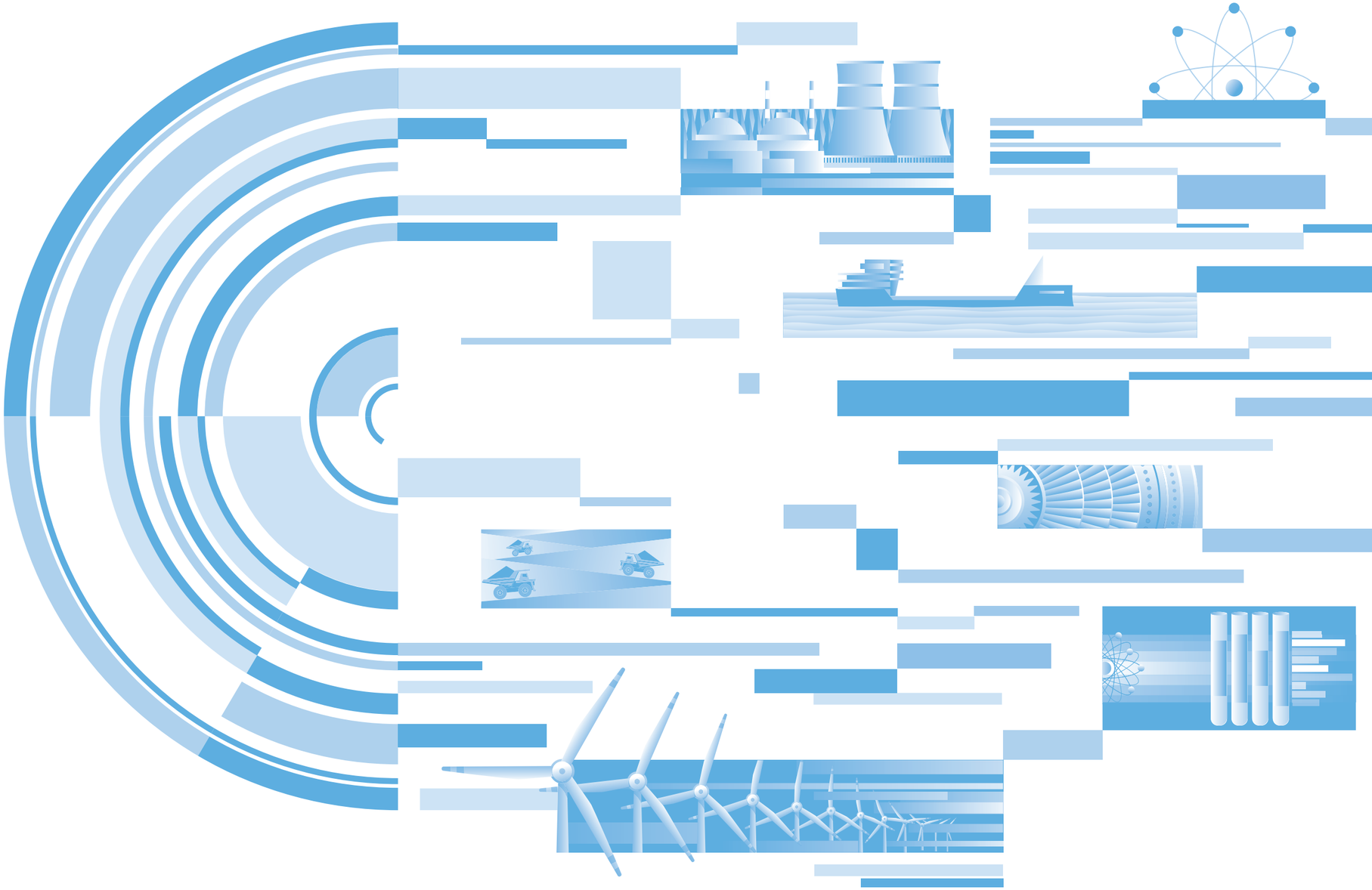
In accordance with the requirements of Art. 69 of the Federal Law On Joint Stock Companies and Art. 15 of the Company's Articles of Association, the General Director organises the implementation of decisions of the General Meeting of Shareholders and the Board of Directors.

General Director of JSC Atomredmetzoloto Vladimir Verkhovtsev was first elected to the position by the decision of the extraordinary General Meeting of Shareholders (Minutes No. 15 dated May 27, 2013). He was re-elected as General Director for a period of three years by the decision of the extraordinary General Meeting of Shareholders of JSC Atomredmetzoloto (Minutes No. 30 dated May 24, 2018).

Vladimir Verkhovtsev does not own shares of JSC Atomredmetzoloto.

Chapter 2

KEY RESULTS AND EVENTS IN THE REPORTING YEAR



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GRI 201–1

2.1 Key results in 2020

Indicators	2018	2019	2020
Uranium production, tonnes	2,904	2,911	2,846
Uranium mineral resource base (Russian assets), '000 tonnes	520.7	512.7	509.4
ROSATOM rank among major uranium mining companies in terms of production volume*	II	II	II
ROSATOM global rank among major uranium mining companies in terms of mineral resource base volume*	II	II	II
Average headcount, people[2]	7,232	7,153	7,189
Employee turnover, %	17.5	20.0	17.1
Revenue, RUB billion	18.5	18.8	20.4
Taxes, RUB billion*	6.3	6.2	7.6
Lost Time Injury Frequency Rate (LTIFR)	0.22	0.22	0

** Taking into account JSC Uranium One Group enterprises.*

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2.2 Operating results

The main value and the highest priority is safety. The Mining Division strives to ensure the complete safety of people and the environment.

The uranium production programme was completed by the mining enterprises in full. The cost of uranium was reduced by 6% compared to the plan.

The coal production programme was 92% completed. The decrease in production volumes was caused by the deformation of the western wall of the coal mine. At the same time, the cost of coal managed to be kept at the level of planned indicators.

[2] The average headcount of financial responsibility centre FRC-2 "Mining" does not include Elkon MMP JSC and EGMK-Project JSC.

PIMCU, PJSC

Mine No. 6

Infrastructure facilities

- The construction of the main step-down substation was completed;
- The construction of the mine water treatment plan (MWTP) was 100% completed.

Above-ground part of the mine

- Heavy equipment of the first stage (the winder and the main mine fan) was manufactured and delivered;
- Top-priority works on preparation for construction were completed (old headgear dismantling, site preparation, foundation plate installation at 19-EDS shaft).

Underground part of the mine

- Procedures were carried out for the development of detailed design documentation for the construction of the shaft;
- Dewatering measures were taken:
  - Detailed design documentation for temporary drainage of the shaft 20R was prepared;
  - Bidding procedures for the supply of submersible pumps were carried out.

Other production sites

- The ninth horizon of Mine No. 8 was put into operation;
- New technological equipment was introduced into the production process:
  - For the first time in Russia, mass production of mining equipment based on lithium-ion batteries was launched under the ARGO trademark;
  - A mobile robotic complex was put into operation for the shipment of rock mass from stopes during the development of flat sheet deposits of uranium ore;
  - New equipment was procured as part of the development programme for the Urtuysky brown coal open-pit mine;
- The medical oxygen generation technology was tested;
- The construction engineering stream of the Process Factory was launched – a platform for practical training in the principles and tools of ROSATOM Production System (RPS).

Dalur JSC

- At the Khokhlovskoye deposit, Western body facilities (operational blocks) were put into operation, construction of the substation SS-110/10 kV was completed;
- Field exploration works at the Dobrovolnoye deposit were completed;
- The operability of the technology for the production of aluminoscandium ligatures was confirmed on the production site;
- The already operating Scandium project reached commercial level, a long-term contract was signed for supply of the entire volume of scandium oxide, which will be produced in 2020-2024.

Khiagda JSC

- Innovative solutions and new technologies were introduced into the production process:
    - A virtual model of the Istochnoye deposit was created based on the reserves of the Khiagda ore field;
    - At the Vershinnoye deposit, automation of the local sorption unit was started;
    - An unmanned aerial vehicle was delivered to the production site that allows real-time monitoring of the area and facilities of the enterprise;
- Construction was completed and units at the Vershinnoye deposit were prepared for the start of operation;
- The Federal Agency for Subsoil Use approved the technical projects for development of the Kolichikanskoye and Dybrynskoye uranium deposits;
- Khiagda JSC confirmed its status of the Leading Enterprise of ROSATOM Production System;
- A 'safety factory' was launched – a training class in which employees of the company hone their safe work skills using special stands.

RUSBURMASH JSC

- The industry order for the RPS project *Ready mine at the Khokhlovskoye deposit* was performed;
- The exploration programme was completed at the Dobrovolnoye deposit;
- The tasks of the 2020 field season at the Pavlovskoye deposit were completed;
- The company continued to cooperate with EuroChem-VolgaKaliy LLC. A unique drilling installation was used to drill exploration wells in the underground mine workings of the Gremyachinsky mining and metallurgical plant.

VNIPIPT JSC

- As part of the development of the Dobrovolnoye deposit, the information modeling technology (BIM) was applied for the first time – a digital twin of the main technological buildings and structures of the project was created.

First Ore Mining Company, JSC

- At the Pavlovskoye lead-zinc deposit (Novaya Zemlya archipelago), the field season was successfully completed, engineering surveys were carried out to design the mining and processing plant, samples were selected for reserves assessment in accordance with the international JORC classification.

Plans for 2021

PIMCU, PJSC

- Continue construction works at the sites of Mine No. 6, start pumping groundwater from the mine;
- Tap prospective reserves of the Yubileinoye deposit of Mine No. 8;
- Transition to the technology of ore processing by heap leaching in pilot work mode.

Dalur JSC

- Start industrial mining of the Western body of the Khokhlovskoye deposit;
- Start construction of facilities for pilot work at the Dobrovolnoye deposit;
- Commission mobile sorption units to increase scandium production.

Khiagda JSC

- Commission the Kh1 body of the Khiagdinskoye deposit;
- Implement the Smart Mine IT project at the Vershinnoye deposit;
- Start construction and mine preparation works at the Kolichikanskoye deposit.

RUSBURMASH JSC

- Technical re-equipment of the equipment stock.

VNIPIPT JSC

- Develop a digital twin of the construction site under the project *Pilot Site at the Dobrovolnoye deposit* together with Dalur JSC and RUSBURMASH JSC, using 4D design technology (information model + work execution plan) and laser scanning.

First Ore Mining Company, JSC

- Pass state expert examinations of the design documentation;
- Develop a pre-feasibility study (PFS).

2.3 Key events in 2020

January

- RUSBURMASH JSC signed a long-term contract with EuroChem-VolgaKaliy LLC for drilling of exploration wells in the underground mine workings of the Gremyachinsky mining and metallurgical plant.

March

- The Institute of Physics and Technology of Ural Federal University, Institute of Industrial Ecology of the Ural Branch of the Russian Academy of Sciences and Dalur JSC signed a memorandum on public control at uranium deposits in the Kurgan Region;
- Elkon MMP JSC acquired a licence for geological survey, exploration and production of gold at the Sovinoye deposit (Chukotka Autonomous Region);
- For the first time in Russia, ARMZ Mining Machinery, LLC started mass production of battery-powered load-haul-dump machines.

April

- JSC Atomredmedzoloto and PIMCU, PJSC were included in the List of Systemically Important Entities of the Russian Economy.

July

- The Central Commission for the Development of Solid Mineral Deposits of the Federal Agency for Subsoil Use of the Ministry of Natural Resources and Ecology of the Russian Federation approved the technical projects for the development of the Dybrynsky and Kolichikansky uranium deposits of Khiagda JSC.

September

- For the first time in Russia, Khiagda JSC together with Seversk Technological Institute of the National Research Nuclear University MEPhi created a virtual model of a uranium deposit;
- PIMCU, PJSC put in operation the ninth horizon of Mine No. 8.

October

- In accordance with the Decree of the President of the Russian Federation dated October 26, 2020, the development of the Pavlovskoye deposit on Novaya Zemlya was included in the strategy for the development of the Arctic;
- Dalur JSC and RUSBURMASH JSC completed exploration works at the Dobrovolnoye uranium deposit in Zverinogolovsky District of the Kurgan Region.

November

- PIMCU, PJSC became the first resident of Krasnokamensk priority social and economic development area.

History of Uranium Mining* publishing project

In 2020, the Mining Division published the book The History of Uranium Mining, which reflects the history of creation of the raw material base of the nuclear industry. It describes in detail how mining and processing plants were built in the shortest possible time, unique technologies for the extraction of uranium and rare metals were developed and implemented, and a mineral resource base for uranium extraction was formed.

The Decree on Uranium Mining adopted in 1942 by the State Defense Committee of the USSR marked the beginning of work in the field of geological exploration, mining, processing of uranium ores, as well as the development of the entire nuclear industry of the USSR. For more than 75 years, uranium production has been a fundamental segment in the nuclear fuel cycle.

** Link to History of ROSATOM, the electronic library http://elib.biblioatom.ru/text/istoriya-uranodobychi_2020/go,0/?bookhl=*

Chapter 3

SUSTAINABLE DEVELOPMENT

GRI 103–2
GRI 102–16

3.1 Sustainable development management system

Key aspects of the operations of JSC Atomredmetzoloto are underpinned by responsibility and sustainability principles. Consistent integration of these principles into key decision-making processes enables the Company to improve the safety of its operations and enhance its environmental stewardship, corporate social responsibility and stakeholder engagement practices; it also provides a basis for sustainable business development and drives economic growth in the regions of operation.

ARMZ recognises the impact of its activities on the environment, society, the life of local communities, and the socio-economic development of the regions of operation, and takes measures to reduce this impact, as well as ensure sustainable growth in the long term in the interests of stakeholders.

The Company's activities in the field of sustainable development are aimed at:

- Ensuring access to low-carbon energy sources;
- Promotion of social and economic development of the regions of the company's operations;
- Promotion of technological progress and innovative development of the industry;
- Modernisation of technological infrastructure and technical re-equipment of industrial production;
- Ramping up scientific and technical potential:
- Development of intellectual and human capital;
- Creation of jobs and contributing to improving the quality of life of people.

3.2 Key sustainable development projects

Programme to provide support (grants) through a contest of social and charity initiatives in the town of Krasnokamensk (Zabaykalsky Territory)

One of the projects aimed at creating jobs and contributing to improving the quality of life of people is a programme to provide support (in the form of grants) through a contest of social and charity initiatives in the town of Krasnokamensk (Zabaykalsky Territory).

The aim of the programme is to promote social support and protection of citizens, create social partnership and opportunities for the introduction of innovative technologies for the sustainable development of the regions of operation and develop self-employment of local people.

Results in 2020

The contest was dedicated to the 75th anniversary of the nuclear industry. Financial support totalling RUB 3.5 million was provided to 39 important social projects.

A series of measures was carried out to train and develop socially oriented citizens:

- Online training for social entrepreneurs on the following topics:
  - Social entrepreneurship in Russia and abroad. New directions in new realities. The world won't be the same;
  - Specifics of sales in times of crisis and quarantine, technologies, directions. How to restore and develop social business;
  - Partnership in a social project. Social franchising. Where to get resources for project development;
- A rally of volunteers among employees of PIMCU, PJSC *Krasnokamensk – a City with a Warm Heart*;
- The quest game *Social Entrepreneurship Free Niche* (a game for 4-5 teams);
- The talk-show programme *'Business in a Single-Industry City Is Cool!'*

Contribution of the project to improving the quality of people's life and/or preserving the environment

- Further formation of a favorable environment for the development of social business in Krasnokamensk;
- Growing prestige of social entrepreneurs thanks to the large-scale information campaign carried out in the media;
- Strengthening of the corporate culture through the involvement of personnel in the implementation of socially significant projects;
- Volunteering development among employees.

Project to preserve the biodiversity of Lake Baikal

In 2020, Khiagda JSC implemented a project to preserve the biodiversity of Lake Baikal, which contributed to the implementation of the Preservation of Lake Baikal Federal Project forming part of the Ecology National Project.

Hatchlings were raised from eggs in special incubators at the Selenginsky experimental fish farm and the Barguzinsky fish farm. Then, employees of Khiagda JSC, in the presence of representatives of the Angara-Baikal Territorial Administration of the Federal Agency for Fishery (Rosrybolovstvo) and the Baikal branch of the Federal State Budget Scientific Institution Russian Federal Research Institute of Fisheries and Oceanography (VNIRO), released grayling into the Ina River of Lake Baikal basin.

A total of 19,000 grayling fry were released. The release of fish helps to restore the lake's endemic fish fauna, aquatic biotic communities in the Ina River and Lake Baikal and the related aquatic food web.

Project to localise the production and servicing of self-propelled mining machines

The project that is being implemented by ARMZ Mining Machinery, LLC is aimed at upgrading technological infrastructure by equipping industrial enterprises with innovative battery-powered mining machines and making the mining production chain more sustainable.

The aim of the project is to start mass production of modern self-propelled mining machines to replace imports, sell them on foreign markets and develop a network of branded after-sales service centres.

Objectives

- Production optimisation and mass production of battery load-haul-dump machines for internal needs and for external customers, including foreign ones;
- Increase in the volume of localisation of accessory equipment (batteries and electric motors);
- Expansion of the product line and mastering the production of other types of mining equipment (mine dump trucks and drilling units), including for the development of Mine No. 6 by PIMCU, PJSC;
- Development of production and application of innovative battery self-propelled mining equipment;
- Development of competencies in the provision of branded after-sales service and supply of spare parts, and expansion of its network in customers' regions of operation;
- Creation and production of new types of mining equipment at the request of customers;
- Dealer supplies of various types of self-propelled mining equipment.

Results in 2020

- The first batch of five load-haul-dump machines was produced and handed over to the customer for testing at the mine of PIMCU, PJSC, three of which already passed the tests and were put into operation;
- Theoretical and practical training of the operators' personnel was carried out;
- The contract for supply of the second batch of four load-haul-dump machines to PIMCU, PJSC was signed;
- The first external contracts for the supply of mining equipment were made with Russian and foreign companies;
- Operational warranty technical support and deployment of a branded service centre were started (staff were recruited, production facilities and a test site were rented, some tools were purchased).

Contribution of the project to improving the quality of people's life and/or preserving the environment

The project helps to increase the comfort of the working environment in mine conditions and reduce the impact of harmful factors on the health of employees by reducing the level of noise, vibration and gas pollution. Due to zero carbon emissions, the environmental impact is reduced not only in the production cycle, but also in logistics. In addition, energy resources and consumables are consumed rationally during operation, which results in industrial waste reduction (reduction in energy consumption, reduction in the amount of lubricants used during service maintenance, power cables do not need to be replaced, complete elimination of spills of combustible materials when refueling in mine conditions).

Chapter 4

DIGITISATION: TECHNOLOGIES AND PRODUCTS

In 2020, the Digitisation Programme of the Mining Division was updated in accordance with ROSATOM's Uniform Digital Strategy. The Division's digital focus in 2021 will primarily be concentrated on addressing the issues of internal digitalisation and implementing the concepts laid down in the Digital ROSATOM 2030 programme.

GRI 103–1

The main efforts were aimed at reducing the impact of risks arising from the COVID-19 pandemic. In particular, automated workstations were promptly provided to all key employees for them to work remotely and safely. This helped to maintain the pace of business and production processes in the new conditions, as well as significantly increase the level of digital maturity of employees.

GRI 103–2

In accordance with safety requirements, in 2020, ARMZ introduced an automatic detection and accounting system to monitor the temperature of employees arriving at the office for work. In particular, when an employee passes through the turnstile, the system instantly determines the temperature of the person using special video cameras with thermal imaging, displays it on a video wall, and if any abnormalities are detected, it gives an appropriate signal to the guard. The results of digitalisation in 2020 include the introduction of a new videoconferencing system to conduct meetings from employee workplaces without the need to gather in meeting rooms.

Khiagda JSC is the flagship of the Mining Division in terms of introducing new digital technologies. As part of the Smart Mine ISL project, the company developed the main functionality of the 2nd stage of the system for the new site at the Vershinnoye deposit. The module for remote control of equipment, the module for accounting and control of repair and restoration work, as well as additional equipment for the video monitoring module were improved. Also, a 3D model of the Istochnoye deposit body was developed with navigation capabilities in a virtual reality environment. The improvement of the 2nd stage functionality of the system for dispatching and accounting of consumed energy resources was completed. As a result, in 2020 the company received new opportunities for automated electricity metering. A software package for vehicle use accounting was introduced, which combined all the resources and processes associated with vehicles into a convenient system. The complex allows to automatically perform most of the operator, control and management work, which provides significant cost savings for the enterprise in the field of vehicle management.

Dalur JSC continued work on the digitalisation of its mining complex:

- 3D models of production blocks of the Central, Western and Ust-Uksyanskaya bodies of the Dalmatovskoye deposit, as well as the Western body of the Khokhlovskoye deposit, were created, on the basis of which epignostic, predictive and optimisation geotechnological calculations for mining were carried out;
- Digital models of the scandium mining process were developed.

VNIPIPT JSC developed BIM models of buildings and structures of Mine No. 6 for PIMCU, PJSC:

- Pithead buildings of shafts;
- Hoist buildings of shafts;
- A building of the main shaft fan installation;
- A building of the main shaft fan installation.

On the basis of the developed models, the graphical part of the design documentation for the new technology was released, which led to an acceleration in obtaining a positive opinion for the project from FAI Glavgosexpertiza of Russia (stage P).

Digitalisation plans for 2021

JSC Atomredmetzoloto

- Launch *Thin Client* ACS system into commercial operation in the pilot working group;
- Achieve the planned import substitution indicator (11%) for user workstations in terms of office software (industry-wide project);
- Implement the System of digital traceability of material flows using marking technology (industry-wide project).

Khiagda JSC

- Put the Smart Mine system into trial operation at the Vershinnoye deposit site, which will allow a preliminary assessment of effects of the Smart Mine ISL project;
- Put into trial operation the information system for plan - fact analysis and deviation management for the main production;
- Develop the functionality of the augmented reality system in terms of working with a geotechnological model of underground in-situ leaching processes;
- Complete the improvement of the 3rd stage of the system for dispatching and accounting of consumed energy resources.

Dalur JSC

- Implement integration solutions to optimise production at the Western body of the Khokhlovskoye deposit. This will allow, in particular, to automatically measure the operation parameters of technological wells and remotely control their operation. For this purpose, the software will be upgraded in order to interface the lower (sensors) and upper levels of automation;
- Perform the 1st stage of development of an information system for production planning and control. The system will combine information on production planning and control of quantitative and qualitative indicators, maintenance of basic production processes, RPS, as well as general-purpose data;
- Construct a new KPSD channel to the Ust-Uksyanskaya local sorption unit with further connection of the remote site to the IT infrastructure of the enterprise;
- Put into trial operation the Smart Hard Hats system.

VNIPIPT JSC

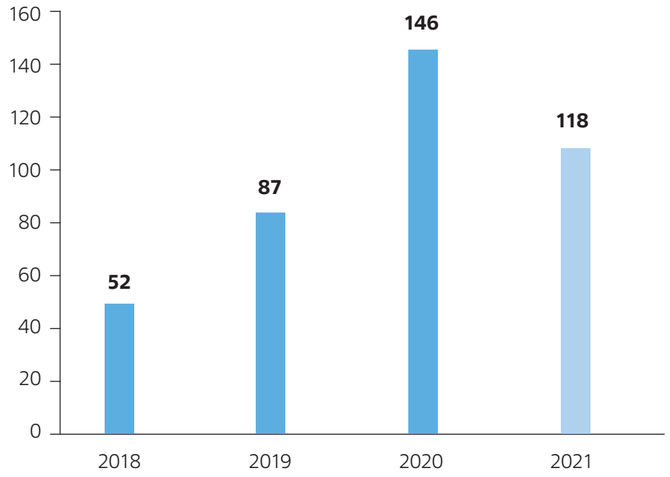
- Improve BIM models of buildings and structures of Mine No. 6 for PIMCU, PJSC (stage P);
- Test the 4D modeling technology, which combines the BIM model of an object (or several objects of an industrial / construction site) and its construction schedule. Thus, a calendar schedule of works is visualised, and it can be made as detailed as possible or, on the contrary, more generalised. In this case, it is necessary to first perform laser scanning of the territory (future construction site) and develop the executive BIM model.

Chapter 5

INNOVATION AND DEVELOPMENT OF SCIENCE

In 2020, ARMZ Holding spent a total of RUB 146 million on innovation.

Expenditure on the Division's innovative development programme in 2018–2020 and 2021 financing forecast, RUB million



Innovative development programme

GRI 103–2

ARMZ Innovative Development Programme is an integral part of ROSATOM's Innovative Development and Technological Modernisation Programme until 2030 (in the civilian sector).

The key objectives of the ARMZ Innovative Development Programme until 2030 include:

- Increasing the efficiency of uranium production at existing uranium mining enterprises;
- Maintaining a breakeven performance of existing uranium mining enterprises;
- Development and implementation of new efficient technologies for the production of uranium, rare and rare-earth metals;
- Business diversification.

The ARMZ Innovative Development Programme consists of two key projects:

- Project No. 1: R&D support of underground uranium mining;
- Project No. 2: R&D support of uranium mining using the in-situ leaching (ISL) method.

R&D support of underground uranium mining

- At PIMCU, PJSC, research was continued on the parameters of paste filling of mined-out workings using the carbonate uranium ore processing tailings at the Argunskoye deposit;
- Research was carried out to obtain a material that may be used for reclamation of the Krasny Kamen mine: the strength and filtration characteristics of the initial paste and experimental samples of the hardening paste were studied;
- Pilot operations were carried out on atmospheric leaching and paste thickening of carbonate ore processing tailings;
- FBI Scientific and Engineering Centre for Nuclear and Radiation Safety (SEC NRS) examined the current legal and regulatory framework applicable to the mine reclamation technology using paste material from uranium ore processing;
- In order to reduce the cost of finished products, technology was developed for obtaining a chemical concentrate of natural uranium (CCNU) without using the process of extractive repurification of desorbates obtained by regeneration of the recommended ion exchanger, with the release of uranium CCNU as commercial products in accordance with the requirements of ASTM C967-13;
- Laboratory tests to intensify heap leaching of uranium from lean and low-grade ores using aerobic bacteria, which commenced in 2019, were completed. Experimental work was carried out on percolation leaching of low-grade ores using bacteria as an additional leaching activator. Technology for bacterial percolation leaching of uranium ores was developed;
- Technological regulations were developed for the process development work at the Experimental Hydrometallurgical Workshop of the Central Research Laboratory for carrying out integrated pilot tests of soda agitation-sorption leaching of raw materials from the Orogochi ore occurrence;
- The technology for processing pyrite cinders was optimised in terms of reducing the volume of circulating solutions, eliminating the evaporation unit and adding units for obtaining conditioned copper and zinc concentrates;
- Technology was developed for processing spent vanadium catalysts of sulphuric acid production to produce commercial vanadium pentoxide. 317 kg of vanadium concentrate was received. The achieved content of V_2O_5 was more than 70%. A package of documents for obtaining a licence for the activities was prepared.

R&D support of uranium mining using the in-situ leaching method

Dalur JSC

- The company continued to use and improve innovative IT solutions for mining and geological exploration provided by the software and information suite of Dalur JSC, which makes it possible to improve the accuracy of reserve calculation, the quality of mining site design and mining efficiency at the Dalmatovskoye and Khokhlovskoye uranium deposits;
- Pilot work on the extraction of scandium as a by-product from mother liquor produced in the course of uranium production was continued; modes of operation and process parameters for scandium extraction were optimised; the production of high-purity (99.9%) scandium oxide was launched;
- A preliminary project was completed on the topic 'Research, development and substantiation of the technical assignment for the development of technology and evaluation of economic efficiency of extraction of REM-actinium concentrate as a by-product from ISL productive solutions of Dalur JSC';
- Work continues on the extraction of sulphuric acid from petrochemical industry waste, which will significantly reduce the expenses on the main leaching agent in the process of uranium ISL;
- The geoecological studies carried out at the Dobrovolnoye uranium deposit confirmed the environmental safety of the development of this deposit using the ISL method.

Khiagda JSC

- Assessment of the suitability of ore bodies of the Vitimskoye uranium ore region (VUOR) for mining by the ISL method was carried out. Criteria for evaluating and ranking 140 uranium ore bodies were developed. Geological, hydrogeological and geotechnological knowledge maps were compiled for the VUOR bodies, which are the basis of the long-term development strategy of the enterprise;
- The company summarised the results of irregular networks of ore deposit uncovering by technological wells (network density in rich areas of uranium ores) at the Khiagdinskoye and Vershinnoye deposits, used in ISL practice for the first time. The use of this technology provides a significant additional income by increasing the development rate in these areas, and also contributes to a proportionate mining of low and high grade uranium ores;
- The testing of productive solutions for the content of rare-earth metals (REM) at the V1 body of the Vershinnoye deposit established that the REM content in technological solutions is 2–3 times higher than at similar sites in Russia (Zauralsky ore region), Uzbekistan and South Kazakhstan. This opens up new prospects for the extraction of rare-earth metals from productive solutions as a by-product together with uranium;
- Khiagda JSC continues to implement a modern method for determining uranium in ores at the stage of reserves uncovering by technological wells and exploiting ore bodies using the method of logging of neutrons of prompt fission, developed jointly by VNIIA JSC and RUSBURMASH JSC. The use of this borehole geophysical equipment made it possible to identify additional uranium reserves at the Kh3, Kh6 and Kh7 bodies of the Khiagdinskoye deposit mined by the ISL method;
- The company completed the development of an intelligent control system for submersible pumps in the extraction wells of the production complex of Khiagda JSC to improve the efficiency of the production site by ensuring constant monitoring of parameters, maintaining optimal operating modes and predicting the technical condition of submersible pumping units;
- As part of the Smart Mine project, a virtual reality software and hardware complex was developed to present and analyze geological information during the development of uranium deposits using the ISL method;
- Work was completed on the following preliminary projects:
  - Substantiation of the methodology and development of means for operational (express) control of the uranium content in technological solutions of in-situ leaching;
  - Research, development and substantiation of the technical assignment for the creation of a digital hydrodynamic model of the Kolichikanskoye deposit prepared for development by in-situ leaching.

Plans for 2021

R&D support of underground uranium mining

PIMCU, PJSC

- Carry out pilot work on autoclave leaching of uranium ores of the Argunskoye deposit to develop technological regulations for the processing of uranium ores from Mine No. 6;
- Develop technological regulations for the processing of carbonate ores from Mine No. 6;
- Prepare an investment feasibility study of the leach plant for processing carbonate ores of the Argunskoye and Zherlovoye deposits of Mine No. 6;
- Prepare a representative technological sample of ore and carry out process development work for percolation leaching of uranium with granulates of small classes of ore material obtained using sulfate-resistant portland cements and other binders;
- Develop measures to optimise the heap leaching (HL) processes to ensure the efficiency of uranium extraction during the transition of technology from hydrometallurgical processing to the processing of currently mined ores by the HL method;

- Continue the research work to assess the possibility of using thickened paste-like tailings of the hydrometallurgical process (carbonate ores of Mine No. 6) for the reclamation of the depleted Krasny Kamen and Tulukui mines and backfilling of mine workings;
- Carry out a feasibility study of the technology of bacterial percolation leaching of uranium ores based on the initial data obtained;
- Continue work on the heap leaching of uranium from pelletised material of small classes in terms of selecting a cheaper and more accessible binder, equipping the pilot plant with equipment, optimising the pelletisation parameters and adapting the currently mined ores, which differ in mineralogical and material composition from off-balance raw materials, to the HL conditions;
- Develop technology for conditioning vanadium pentoxide concentrate, obtained from spent catalysts of sulphuric acid production, in order to produce commercial products with high added value with V_2O_5 content of at least 97%, corresponding to TU 48-4-429-82;
- Obtain a licence for the handling of toxic waste for the processing of spent vanadium catalysts of sulphuric acid production.

R&D support of uranium mining using the in-situ leaching method

Dalur JSC

- Carry out pilot work on the extraction of uranium by the ISL method at the Dobrovolnoye deposit;
- Continue work on the extraction of scandium as a by-product from mother liquors of the main production and production of scandium oxide of high purity 99.9%, as well as expansion of the range of products (aluminum-scandium ligature, scandium fluoride, etc.);
- Continue work on the use of purified (spent) sulphuric acid from petrochemical waste;
- Continue geoecological studies at the Dobrovolnoye deposit.

Khiagda JSC

- Complete works on the project for the Development of technology for mining low-watered areas of ore bodies of the Khiagdinskoye deposit in the upper reaches of paleovalleys based on a hydrodynamic model. Assess the economic and practical value of the results obtained and, in case of a positive assessment, proceed with the implementation of the results of the work into production;
- Replicate the Smart Mine project for the technological block of the Vershinnoye deposit;
- Prepare a feasibility study for the sequential extraction of rare-earth metals from the mother liquors of Khiagda JSC using a mobile unit;
- Conduct mineralogical studies of mineral forms of redeposited uranium at the man-made geochemical barrier of the Khiagdinskoye deposit;
- Continue work on the final extraction of uranium reserves;
- Further develop the technology for the application of irregular schemes for ore body uncovering at the Khiagdinskoye, Istochnoye and Kolichikanskoye deposits;
- Develop an information system for plan-fact analysis and deviation management of the main production;
- Design and manufacture a prototype device (manipulator) for extracting foreign objects from technological wells with the possibility of visual control.

Chapter 6

NEW PRODUCTS AND BUSINESSES

GRI 102–2
GRI 102–4
GRI 102–6

The Mining Division is a centre of responsibility tasked with providing ROSATOM and the Russian Federation with uranium and other strategic metals that are used in cutting-edge areas of the modern economy: additive manufacturing, robotics, energy storage systems, high-temperature and renewable energy, etc.

Accordingly, the development of projects in mining and related industries with a focus on the production of strategic metals is one of the priorities of the Division's strategy and includes the following businesses:

- Provision of services: exploration and drilling, engineering services and design, construction of engineering structures and communications;
- Mining of gold;
- Mining of coal;
- Mining and processing of non-uranium ores;
- Mining and processing of rare and rare-earth metals;
- Extraction of useful components from dumps, solutions and secondary sources;
- Manufacturing of mining equipment.

Map of the Mining Division's projects

In its traditional regions of operation (the Zabaykalsky Territory and the Kurgan Region), the Division is implementing projects aimed at increasing the processing depth of raw materials that it produces. As part of the project to produce scandium as a by-product, Dalur JSC (Kurgan Region) continues to produce scandium oxide and fluoride, which are by-products of uranium mining using the in-situ leaching method, successfully performs the existing contracts for supply of products, and has formed a long-term portfolio of orders. In PIMCU, PJSC (Zabaykalsky Territory), production of coal with a high calorific value (sized coal) has reached a stable level, enabling the enterprise to increase coal sales to new customers in the foreign market.

The search for and implementation of promising projects involving the use of the infrastructure, facilities and technical capabilities of PIMCU, PJSC as part of an industrial partnership, including within Krasnokamensk priority social and economic development area (Krasnokamensk PSEDA), remains an important focus of the programme implemented by the Division. In 2020, the Division continued to search for potentially attractive projects and business initiatives.

In the reporting year, the Division continued to work on a number of large-scale mining projects, including projects in the Novaya Zemlya Archipelago (the project for creation of a production complex on the basis of the Pavlovskoye lead and zinc deposit), in the Tomsk Region (the project for organisation of production of titanium-zirconium concentrates on the basis of the Tuganskoye deposit), etc.

An additional contribution to the activities of the Division is made by the service companies specialising in the provision of services and work on drilling, exploration support (RUSBURMASH JSC), engineering and design (VNIPIPT JSC), as well as the construction of engineering structures and communications (Elkon MMP JSC). In the reporting year, VNIPIPT JSC and RUSBURMASH JSC increased their revenue from the provision of services in external markets severalfold (by 140% and 223% respectively).

As part of the rare and rare-earth metals mining and processing business and in compliance with the Roadmap for the development of the high-tech area, Technologies of New Materials and Substances, approved by the Government of the Russian Federation, a Competence Centre was established in 2020, which is entrusted with the following main functions: analytical support for the work of the Association of Rare and Rare-Earth Metals Producers and Consumers, technological foresight, market analysis and other forecasts; preparation of proposals for the roadmap and business expert examination of projects. As part of this work, with the participation of the Ministry of Industry and Trade of Russia, a large-scale study of the domestic Russian market for RM and REM production and consumption was carried out and growth areas were identified.

Work is underway to develop gold deposits, another licence was acquired for gold mining in Chukotka (the Sovinoye deposit). The development of the Severnoye deposit continues.

Project to provide raw materials for strategic initiatives (rare and rare-earth metals product area)

The aim of the project is to meet the demand of the Russian industry for rare and rare-earth metals using the existing and newly created infrastructure, available human resources and technological capabilities.

Several projects are being worked out, including a project for the extraction of lithium raw materials with the subsequent production of lithium carbonate and meeting the needs of the energy storage production facilities being built up, and projects for the processing of titanium raw materials.

Results in 2020

- The Government of the Russian Federation approved the Roadmap for the development of the high-tech area, Technologies of new materials and substances, including rare and rare-earth metals area;
- The sales geography of scandium products was expanded: sales were established, including abroad; a long-term agreement was signed, and a batch of scandium oxide with a purity of 99.9% was delivered;
- The Division continued to increase the output of high-quality scandium products: 486 kilograms of scandium products (in terms of scandium oxide contained) were produced, and 366 kilograms of high-purity scandium oxide were sold.

Contribution of the project to improving the quality of people's life and/or preserving the environment

The project will create new jobs in the Division's regions of operation, increase ROSATOM's revenue and regional and federal tax revenue.

As part of the implementation of the Technologies of new materials and substances Roadmap in rare and rare-earth metals area, ARMZ is considering joint projects for the creation of a titanium-zirconium production, as well as the extraction of rare-earth metals from phosphogypsum. By resuming the production of rare-earth metals and expanding the production of rare metals, the Division will provide high-technology industries of the Russian Federation with domestic products, which will make a significant contribution to accomplishing the strategic objective of import substitution.

Pavlovskoye project

The aim of the project is to create a cost-effective industrial facility comprising a mine and a processing plant at the Pavlovskoye lead and zinc deposit.

Results in 2020

The design documentation developed for the project was submitted to the state environmental expert review. As part of the project optimisation, a preliminary feasibility study for the project was prepared according to the updated concept, the 2020 field season was completed, additional engineering surveys were carried out, materials were prepared for assessing mineral resources and ore reserves in accordance with the international JORC methodology, and state financing of the project infrastructure facilities was approved in the amount of RUB 7 billion.

Contribution of the project to improving the quality of people's life and/or preserving the environment

The project will make a positive impact on the social and economic situation in the Arkhangelsk Region through infrastructure development and will also significantly expand the resource base in the Arctic to meet the needs of the Russian Federation. The project will enable ROSATOM to increase its share on international markets.

Project to organise exploration and pilot development of the Severnoye deposit and Project to organise gold mining at the Sovinoye deposit

The aim of the projects is to carry out exploration (including pilot development) at the Severnoye and Sovinoye deposits in order to explore and confirm gold reserves and associated components and prepare the deposits for commercial development.

Results in 2020 for Severnoye project

- Design documentation was developed, and a project of exploration works at the deposit passed an expert examination;
- A technical project for pilot work at the deposit passed an expert examination;
- A heap leaching site was built.

Results in 2020 for the Sovinoye project

- A licence for exploration works was obtained;
- A project of appraisal works was developed and an examination was passed at the FSI Rosgeolexpertiza.

Contribution of the Severnoye and Sovinoye projects to improving the quality of people's life and/or preserving the environment

The projects enable the Division to start preparing for the future comprehensive development of the Elkon uranium ore area in the Republic of Sakha (Yakutia) and improve the social situation in the region by creating new jobs.

Chapter 7

DEVELOPING THE HUMAN CAPITAL

GRI 102–8
GRI 401–1
GRI 405–1

7.1 Key personnel characteristics

Average headcount in the regions of operation, people

Constituent entity of the Russian Federation	2018	2019	2020
Moscow	526	569	646
Kurgan Region	654	642	689
Irkutsk Region	1	1	9
Zabaykalsky Territory	5,563	5,481	5,377
Republic of Buryatia	495	469	497
Volgograd Region	0	0	18
Republic of Sakha	2	4	8
Primorsky Territory	0	0	2
Total	**7,241**	**7,166**	**7,246**

There was growth in the headcount due to an increase in the volume of drilling operations and the headcount at RUSBURMASH JSC (+54 people) in all regions of presence, except the Zabaykalsky Territory, where the number of employees continues to decline, mainly due to restraining recruitment and optimising the number of personnel at PIMCU, PJSC (-88 people).

Average headcount by employee category

Employee category	2018		2019		2020	
	%	people	%	people	%	people
Executives	13.97	1,011.6	14.08	1,009.0	14.09	1,020.7
Specialists	17.96	1,300.6	18.79	1,346.3	19.56	1,417.2
White-collar workers	0.57	41.5	0.59	42.3	0.65	47.2
Blue-collar workers	67.50	4,887.6	66.54	4,768.0	65.70	4,760.6
Total[3]	**100**	**7,241**	**100**	**7,166**	**100**	**7,246**

[3] Average headcount of FRC-2 "Mining".

In the distribution of personnel by categories, the share of specialists increased by 0.7% due to an increase in their number at RUSBURMASH JSC (+19 people) and in VNIPIPT JSC (+25 people), while at PIMCU, PJSC the number of blue-collar workers decreased (-59 people).

Number of employees by employment type, people

Personnel distribution by employment contract and employment type	2018	2019	2020
Headcount at the end of the reporting period	7,405	7,335	7,490
Working under an employment contract signed for an indefinite period	6,991	6,961	7,037
Part-time employees	44	76	43
Fixed-term employees	414	374	453

In the distribution of personnel by employment type, the share of fixed-term employees increased, most of whom (79%) are employed by RUSBURMASH JSC.

Number of employees by age

Personnel distribution by age	2018	2019	2020
Under 35			
Number	2,335	2,138	2,070
% of the total headcount	31.5	29.1	27.6
36 to 50 years old			
Number	3,183	3,323	3,547
% of the total headcount	43.0	45.3	47.4
Over 50			
Number	1,887	1,874	1,873
% of the total headcount	25.5	25.5	25.0

In 2020, the decline in the share of young employees, characteristic of advanced economies, continued.

Staff distribution by gender

Staff distribution by gender	2018	2019	2020
Male			
Number	5,544	5,457	5,509
% of the total headcount	74.9	74.4	73.6
Female			
Number	1,861	1,878	1,981
% of the total headcount	25.1	25.6	26.4

The decrease in the share of men in the total headcount at the end of the reporting period was due to higher turnover among men than among women.

Number of dismissed employees by region of operation, people

Number of dismissed employees by region of operation	2018	2019	2020
Moscow	143	118	108
Kurgan Region	170	310	178
Irkutsk Region	1	1	4
Zabaykalsky Territory	782	765	730
Republic of Buryatia	176	242	201
Volgograd Region	0	0	18
Republic of Sakha	0	2	17
Primorsky Territory	0	0	5
Total	**1,272**	**1,438**	**1,261**

There was a decrease in the total number of dismissed employees in all regions of operation, except certain regions of RUSBURMASH JSC's presence, where the number of employees is insignificant.

GRI 405–2
GRI 103–2

The remuneration of employees is based on the Integrated Standardised Remuneration System of ROSATOM (ISRS), which provides the basis for a single approach to the establishment of wages and salaries in the Division and provides employees with a stable income regardless of their gender, ethnicity, religion, age or minority status.

Labour costs and insurance premiums, RUB million

Indicator	2018	2019	2020
Payroll, total	5,513.430	5,736.813	6,158.143
Payroll tax (insurance premiums)	1,675.165	1,767.832	1,896.630

The amount of the average monthly salary in the Division at large continues to increase, without outpacing, the growth rates of labour productivity.

Average monthly salary in the Division, RUB

Indicator	2018	2019	2020	Changes, %
Salary	62,747	65,909	70,147	106.4%

GRI 202–1

The minimum basic wage (the amount of the salary established for an employee, the integrated incentive and the monthly indexing payment, adjusted for the regional coefficient and a prorated increase in salary) in all enterprises of the Division exceeded the minimum living wage for the working-age population in the Division's regions of operation.

7.2 Personnel training

GRI 404–1
GRI 404–2
GRI 404–3

Personnel training and development is one of the key areas of the Division's HR policy, and its priority objectives include:

GRI 103–2

- Increasing the coverage and speed of learning through mobile applications and the development of distance learning;
- Localisation of training programmes through the development of a pool of internal trainers;
- Adjusting vocational training programmes taking into account the requirements for new competencies.

The Division uses the following forms of training: external training (engaging external companies) and internal training (by employees of the enterprises). In addition, online training is used: the ROSATOM Academy remote portal; a mobile educational platform, which includes an application and its web version RECORD mobile; and the RECORD information system.

In connection with the measures taken due to the unfavorable epidemiological situation associated with the incidence of COVID-19, and the possibility for the Holding's employees to attend training events in electronic format using the RECORD Mobile device application, in 2020 there was a significant increase in the number of courses aimed at developing staff knowledge, which contribute to improving the efficiency of, but are not critical for, employees' professional activity. Employees of the enterprises showed the greatest interest in the cycle of classes 'Safe behaviour: me, employees, culture' on the topics: 'Where to get strength for yourself. Recovery after stress', 'Shaping a culture of safety in a team', 'Shaping a culture of safe behaviour in a team'.

7.3 Social policy

GRI 201–3

Social support is provided to employees and their families, as well as to retirees in accordance with the Uniform Industry-Wide Social Policy of ROSATOM and its organisations through the implementation of corporate social programmes, as well as other commitments stipulated by collective agreements and local regulations in the Division's organisations.

RUB 210.7 million was spent by the Division on social initiatives and commitments.

GRI 103–2

The main priorities of the Division's social policy in 2020 included:

- Ensuring the monitoring of employees and their families' health;
- Creating comfortable conditions for employees distance (remote) work;
- Ensuring social protection of employees and retirees in the epidemiological situation.

Social expenses in 2018–2020

Indicator	2018	2019	2020	
	RUB million	RUB million	RUB million	%
Healthcare programmes	44.629	49.784	50.084	23.8
Health resort treatment and wellness	1.326	10.149	5.746	2.7
Support for retirees	15.939	17.500	15.258	7.2
Providing better living conditions for employees	18.417	15.311	17.673	8.4
Private pension plans	50.787	50.908	34.331	16.3
Expenditure on sporting and cultural events	19.378	22.580	17.133	8.1
Catering	20.756	25.532	33.821	16.0
Financial assistance to employees	8.242	11.260	10.994	5.2
Other social expenses	32.342	35.942	25.703	12.2
Total	**211.815**	**238.966**	**210.743**	**100**

In the structure of social expenses (SOCEX), there was a decrease in the share of expenses on sporting and cultural events (-1.3%), health resort treatment and wellness (-1.5%) and reimbursement of travel expenses to a place of vacation as part of other social expenses (-2.8%).

The share of expenditure on private pension plans also continued to decrease from 24% (2018) to 16.3% (2020), due to a decrease in the number of participants of the private pension plan corporate social programme of PIMCU, PJSC.

7.4 Relations with higher educational institutions and young people

The Division's HR policy gives priority to recruiting, supporting and retaining young talents, enabling young people to actively participate in innovation, developing and improving a system for social and psychological adaptation of young employees.

In order to maintain a high level of involvement of young employees, in August 2020, a youth forum *Priority 2020* was held on at the Sputnik children's health camp in the Zabaykalsky Territory, in which more than 30 of the most active participants of the youth movement of PIMCU, PJSC took part. During the forum, the employees studied the model of four communication channels; at a meeting with the General Director they discussed the main priorities of the industry, the Holding and the association. The forum programme also included workshops on public speaking and on participation in grant programmes. Projects in the areas of human resources development and corporate social volunteering were developed following the event.

7.5 Support for veterans

The share of expenditure on support for retirees in the total SOCEX decreased insignificantly from 7.3% (2019) to 7.2% (2020) due to a decrease in the number of retirees registered in the Division's organisations.

In 2020, the Division spent RUB 15.3 million on support for retirees, including RUB 13.4 million on regular pension supplements and RUB 1.9 million on financial assistance and partial reimbursement for the cost of health resort treatment.

Number of retirees registered in the HR departments, councils of veterans, and trade unions, people

Category	2018	2019	2020
Total	2,390	2,036	1,637
including			
Honoured retirees in the nuclear industry	1,040	1,069	920
Distinguished retirees in the nuclear industry	514	506	470
Not classified as honoured/distinguished retirees	836	461	247

The decline in the number of retirees was caused mainly by the fact that some retirees in PIMCU, PJSC were removed from the register due to their departure from Krasnokamensk to other regions of Russia.

7.6 Collective agreements and trade unions

GRI 102–41

Currently, the Division has three collective agreements (PIMCU, PJSC, Dalur JSC and VNIPIPT JSC) and two trade unions (PIMCU, PJSC, VNIPIPT JSC). In Dalur JSC, employees' interests are represented by the Works Council, which actively engages with the employer.

Expenditure of the Division's organisations on the activities of trade unions (on salaries of full-time trade union officials, their bonuses and social benefits) increased from RUB 3.1 million (2019) to RUB 3.9 million (2020).

The share of trade union members in the total headcount of the Division as at December 31, 2020 totalled more than 39%.

Number of employees who are covered by collective agreements and are members of trade unions, people

Indicator	2018	2019	2020
Number of employees covered by collective agreements	6,004	5,642	5,947
Number of trade union members	2,527	2,852	2,902

Employee engagement

In 2020, the Division's enterprises took part in the annual employee engagement survey *Your Opinion Matters to ROSATOM*. Based on the findings of the survey, the enterprises developed and implemented action plans to increase the employee engagement rate.

Employee engagement rate, %

Company	2018	2019	2020
JSC Atomredmetzoloto	80	88	90
PIMCU, PJSC	66	70	72
Khiagda JSC	68	75	75
Dalur JSC	50	83	86
TOTAL across the Division	**68**	**76**	**78**

AtomSkills

In August 2020, the team of the Mining Division took part in ROSATOM's 5th industry-wide professional skills competition, AtomSkills 2020. For the first time in the history of the championship, the Division won nine medals:

- Vasily Dynenkov, an electric and gas welder from PIMCU, PJSC, brought silver to the team. This is the first and long-awaited victory in the Welding Technologies category;
- Seven silver medals were won in the Analytical Control category. They were won by Anna Yakovleva, Tatiana Ganzhurova, Anna Dneprovskaya, Yulia Krasnoperova from Khiagda JSC, Elena Volozhanina, Natalia Selezneva and Anastasia Silkina from PIMCU, PJSC;
- The third position and a bronze medal was won by Daria Safonova (VNIPIPT JSC) in the Accounting category. There was also a good result from a team of designers from the same scientific institute in the Engineering Design category.

WorldSkills Hi-Tech

In the 7th national competition of cross-industry skilled professions for workers in high-technology industries, WorldSkills Hi-Tech 2020:

- Participants representing VNIPIPT JSC, who were members of ROSATOM's team, won silver medals in the Engineering Design category;
- Participants representing Khiagda JSC, who were members of ROSATOM's team, ranked first in the Ecology category.

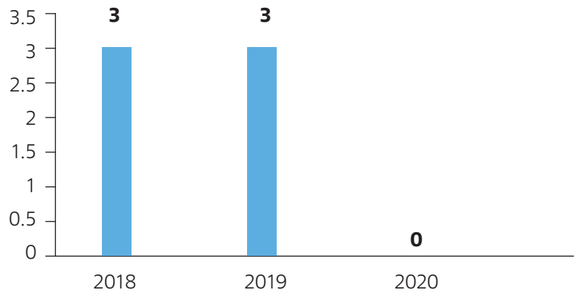
GRI 102–11

7.7 Occupational health and safety

Results in 2020

In 2020, there were no accidents or industrial accidents investigated in accordance with federal rules and regulations at the facilities of the companies managed by JSC Atomredmetzoloto.

Number of accidents at the enterprises of JSC Atomredmetzoloto in 2018–2020



Lost time injury frequency rate (LTIFR) GRI 403–9

	2018	2019	2020
Target	0.49	0.43	0.38
Actual	0.22	0.22	0

Fatal injury frequency rate (FIFR)*

2018	2019	2020
0.075	0.075	0

Lost day rate (LDR)**

2018	2019	2020
4.12	3.28	0.45

Occupational disease rate (ODR)* ** GRI 403–10**

2018	2019	2020
0.14	0.16	0.13

* The FIFR was calculated using the following formula: Number of fatal injuries/Total number of man-hours worked)*1,000,000.
** The LDR was calculated using the following formula: Number of days lost due to accidents and occupational diseases/Total number of man-hours worked)*200,000.
*** The ODR was calculated using the following formula: Total number of occupational diseases per year/Total number of man-hours worked)*200,000.

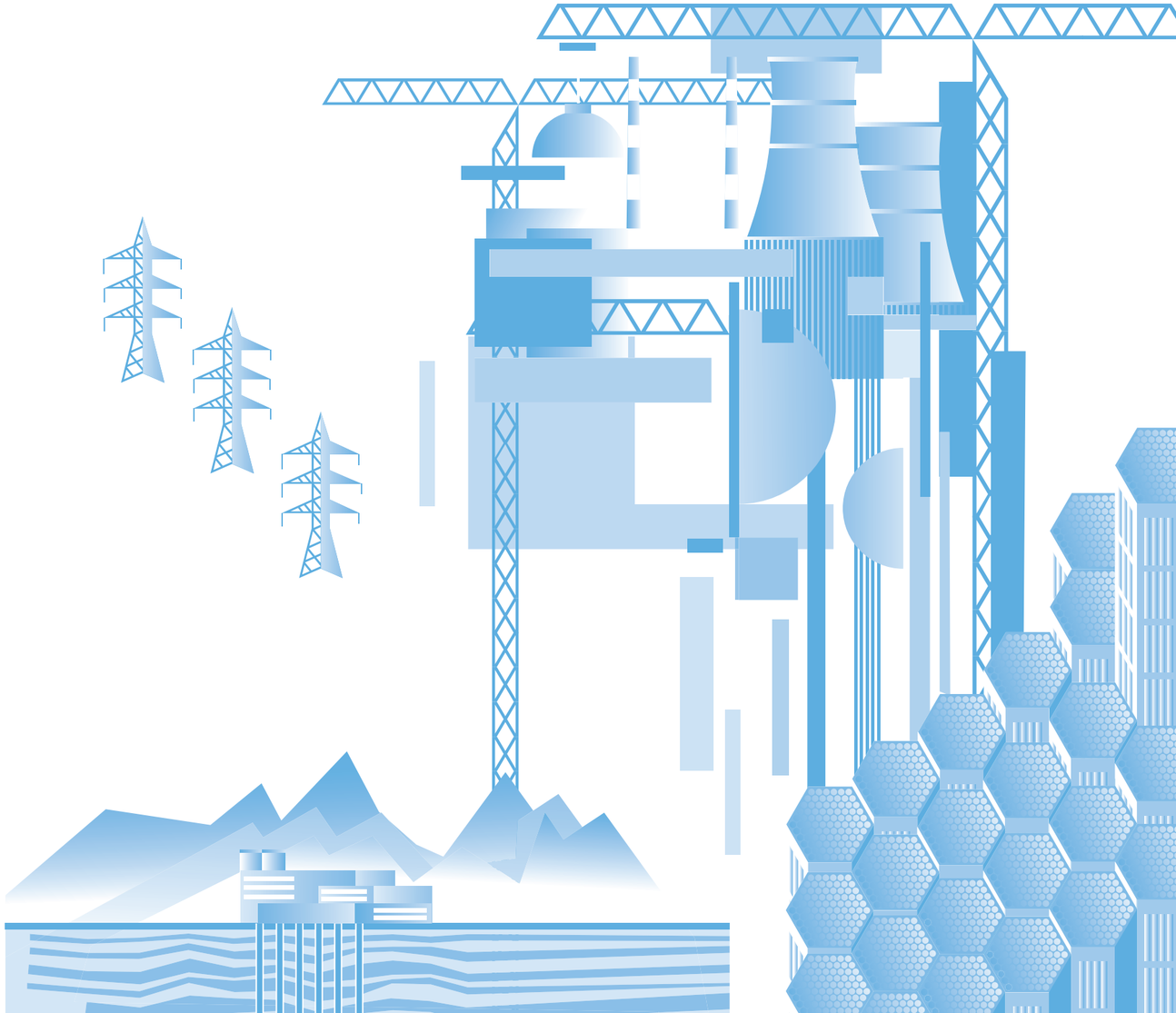
GRI 403–7

The following measures were taken in 2020 to ensure safe working conditions:

- Measures are taken on an ongoing basis to prevent injuries from rock collapse and during operation of intramine transport in underground mining;
- The Regulation on encouraging safe work practices among employees of main professions, their conscious safe behaviour in the workplace and prevention of hazardous actions and hazardous conditions was updated;
- The Regulation on personal responsibility of department heads in organisations was updated.

Plans for 2021 and beyond

- In order to improve the quality of organisations' activities, put into effect ROSATOM's Uniform Industry-Wide Guidelines for Occupational Risk Management, update the methodology for identifying hazards at the workplace, assessing occupational risk and developing measures to reduce occupational risk;
- As part of the implementation of technical measures, it is planned to replicate stage-by-stage in the structural subdivisions the automated software and hardware complex for electronic testing of employees to check their knowledge on occupational safety.



Chapter 8

DEVELOPING THE REGIONS OF OPERATION

8.1 Management system for cooperation with the regions of operation

Corporate social responsibility is a core component of the Division's business strategy. It includes investments in society and the environment, as well as ensuring the long-term growth of the Company.

The Mining Division makes a lot of efforts to make business more responsible by taking part in addressing sustainable development issues in different regions of the Russian Federation where the Company's assets are located.

The Division contributes to improving the standard of living by investing in the local community, social facilities and infrastructure. ARMZ supports the economy at the national, regional, and local levels by paying taxes, employing local people, and procuring from local markets.

Every time when it invests in a new deposit or enterprise, the Company first assesses the social and economic risks and impacts that it may have at the local and regional levels. When developing long-term strategies for engaging local communities, institutions, authorities, and organisations, ARMZ seeks to ensure that the local people receive the maximum possible benefit from the implementation of programmes, taking into account the wishes of the local people at all stages of design and development of enterprises. Moreover, we are constantly working to increase the involvement of the local community in the dialogue, even in the most remote areas, taking into account their local traditions and way of life.

GRI 102–47

ARMZ has been systematically and consistently building relationships with stakeholders since 2008.

The stakeholder engagement system provides:

- Regular comprehensive analysis of the needs and proposals of the local community;
- Feedback mechanisms for collecting requests and proposals from stakeholders;
- Regular meetings and public opinion polls;
- Dialogues during the preparation of non-financial reports.

8.2 Impact on local communities in the regions of operation

GRI 103–1

Developing the regions of operations is central to achieving the Mining Division's strategic goals. Given the geographical footprint of its business, the Company views maintaining stable employment, enhancing its positive image and gaining public confidence as one of its priorities.

GRI 207–4

Tax payments of ARMZ Uranium Holding's key enterprises to regional and local budgets in 2016–2018, RUB million

Regional and local budgets	Enterprises of ARMZ Uranium Holding	2018		2019		2020	
		Company	CTG	Company	CTG	Company	CTG
Kurgan Region	**Total, including**	141	129	135	106	170	200
	Dalur JSC	128	100	121	82	150	158
	RUSBURMASH JSC	13	29	14	24	20	41
Republic of Buryatia	**Total, including**	232	375	253	302	272	495
	Khiagda JSC	222	350	245	287	260	466
	RUSBURMASH JSC	10	25	8	15	11	30
Zabaykalsky Territory	**Total, including**	795	1,112	733	1,019	750	1,618
	PIMCU, PJSC	757	1,055	686	950	694	1,488
	RUSBURMASH JSC	13	21	16	26	19	47
	Khiagda JSC	24	34	27	37	32	71
	VNIPIPT JSC	1	2	4	6	5	12
Irkutsk Region	**Total, including**	–	–	–	–	1	4
	RUSBURMASH JSC	–	–	–	–	1	4
Amur Region	**Total, including**	–	–	–	–	–	–
	RUSBURMASH JSC	–	–	–	–	–	–
Arkhangelsk Region	**Total, including**	1	–	–	–	–	–
	RUSBURMASH JSC	–	–	–	–	–	–

Regional and local budgets	Enterprises of ARMZ Uranium Holding	2018		2019		2020	
		Company	CTG	Company	CTG	Company	CTG
Volgograd Region	**Total, including**	–	–	1	–	3	7
	RUSBURMASH JSC	–	–	–	–	3	7
Republic of Sakha (Yakutia)	**Total, including**	4	–	9	–	10	–
	EGMK-Project JSC	4	–	7	–	5	–
	Elkon MMP JSC	–	–	–	–	4	–
Total		**1,168**	**1,616**	**1,122**	**1,427**	**1,196**	**2,324**

Each enterprise of the Division provides employment opportunities for local residents.

GRI 203–2

Employment of local residents has many advantages: it helps to strengthen ties between business and local communities in the regions of operation, reduces the cost of transporting shift personnel from other regions and the impact of emissions on the environment. Employees are involved in the process of improving the social and economic conditions in the region from the first day. This helps to enhance the positive impact on the local economy.

As part of the 7th competition of charitable and social projects in 2020, grants were distributed to the volunteers of the Mining Division:

- Anna Karacheva and her project *Comfortable Old Age* (acquisition of medical mattresses with orthopedic properties);
- Daniil Pimenov and his project *#ThankstoMedicsofKrasnokamensk* (acquisition of protective suits);
- Elvira Gritsay and her project *Remember and Stand Proud* (restoration of mass graves).

GRI 103–2
GRI 202–2

In accordance with the CSR principles, the Division hires local residents, creates opportunities for their employment, which allows to increase income and improve the standard of living of the population. More than half of the top managers in the regions of operation are employed from among the local residents.

In the reporting period, the Holding did not make any impacts necessitating the relocation of local residents.

The first in the first!

The first industry-wide Corporate Social Responsibility and Volunteering Competition named after Anatoly Alexandrov.

The competition was held for the first time to identify the best volunteer initiatives and practices in CSR and develop a social project management system. A total of 204 applications were submitted from all ROSATOM divisions and numerous organisations outside the scope of the Divisions, with the total number of participants and their team members exceeding 800 people.

In the *Best CSR Project* category:
1st place was awarded to the Social Entrepreneurship Development Programme project (Victoria Dolina, Ivan Krupyanko, JSC Atomredmetzoloto).

In the category *The Best Idea of a Social or Environmental Project*:
2nd place was awarded to the Closed-loop Waste Cycle project (Ekaterina Karezina, VNIPIPT JSC).

8.3 Investments in social infrastructure and charity

GRI 203–1

In addition to paying taxes to regional budgets, ARMZ invests in local communities - in education, healthcare, culture and infrastructure.

The Company believes that the effective management of social investments forms the basis of long-term sustainable development. When developing, monitoring and evaluating the effectiveness of social investment programmes in all regions of operation, ARMZ follows the best industry practices and standards.

8.4 Volunteer projects

In addition to corporate charity programmes, employees implement volunteer projects on their own initiative and at their own expense:

- *Good Things*: collecting clothes and other items for the Good Things social project;
- *Solntsevo Shelter*: collecting rags for the Solntsevo dog shelter;
- *Batteries and Light Bulbs*: recycling of used batteries and light bulbs;
- *Become a Santa Claus 2021*: collecting New Year's gifts for children undergoing treatment at the antitubercular sanatorium in Krasnokamensk.

Employees of the Division took part in raising money to help people affected by the pandemic in the regions of operation:

- **RUB 100,000** Khiagda JSC volunteers purchased 50 food packages and delivered them to families in need;
- **RUB 100,000** PIMCU, PJSC volunteers purchased food packages and delivered them to people in need in Krasnokamensk;
- **RUB 310,000** ARMZ volunteers purchased 1,500 medical protective suits and delivered them to Krasnokamensk Regional Hospital No. 4.

In order to support local communities, the Division's subsidiaries have the opportunity to independently implement social initiatives. The enterprises of the Division participate in annual charitable events and the cultural life in the regions of their operation, including support for children from orphanages, large families, social support in solving issues of regional improvement, and they also play an active part in environmental events and clean-up days and organise public events and holidays.

GRI 413–1

8.5 Charity projects

Projects in the regions of operation

- A programme was implemented to provide support through a contest (in the form of grants) to socially oriented small and medium-sized businesses, including the 7th Competition for Charitable and Social Projects of the urban settlement *Town of Krasnokamensk-2020*, dedicated to the 75th anniversary of the nuclear industry;
- 43 sets of educational books *Journey through Countries and Continents* were published and distributed in specialised children's institutions in Krasnokamensk (Zabaykalsky Territory), Dalmatovo (Kurgan Region), and the Republic of Buryatia;
- Repair works were carried out in the visitor centre of the Russian Arctic National Park, etc.

Projects dedicated to the 75th anniversary of the Great Victory

- A set of measures aimed at patriotic education were carried out, including the installation of an entrance stele at the Terbunsky Frontier memorial (Terbunsky district of the Lipetsk Region);
- A schematic map entitled *March of the Kremlin Cadets* was published, describing the military history of the cadet regiment in the Battle of Moscow in 1941 and intended for distribution among the participants of the March of the Kremlin Cadets project;
- The military-historical work *The Book of Memory of the Military Academy of the General Staff* was printed;
- ARMZ supported the construction of a monument to the sailors who died in the battle near Moscow in the autumn of 1941, on the Naval site of the Victory Museum in Moscow, etc.

Chapter 9

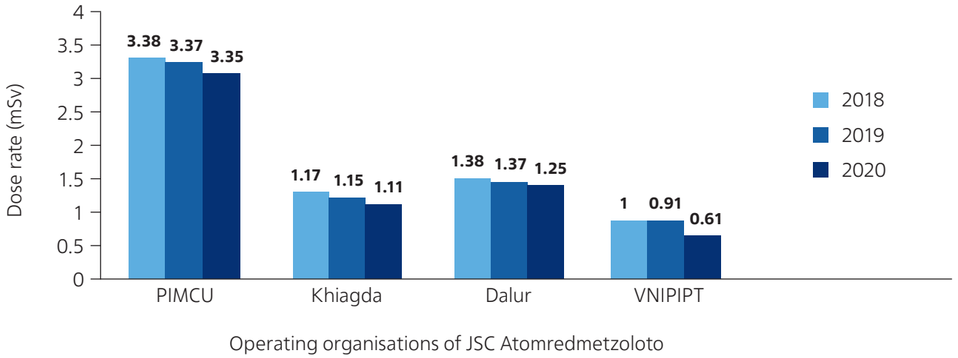
SAFETY OF OPERATIONS

9.1 Nuclear and radiation safety

During mining and processing of uranium raw materials, the operating organisations of JSC Atomredmetzoloto handle nuclear materials of natural origin, in which the content of the uranium-235 radionuclide does not exceed 0.72%. In this regard, there are no prerequisites for the occurrence of a chain reaction of nuclear fission at the facilities where uranium raw materials are extracted and processed.

In the reporting period, the individual effective dose did not exceed 20.0 mSv for any employee in the operating organisations of JSC Atomredmetzoloto. The individual dose limit of 100.0 mSv was not exceeded between 2016 and 2020.

Average effective dose in 2018–2020, mSv



The average annual effective dose for personnel working at the sites of PIMCU, PJSC posing radiation hazards (underground mines and the leach plant) was unchanged and remained at an acceptable level. There were no changes in the number of deviations rated at level 1, 0 or 'out of scale' on the INES scale.

Results in 2020

PIMCU, PJSC worked consistently to improve radiation safety in mine workings:

- 19 concrete and wooden bulkheads were installed in underground mines No. 1 and No. 8;
- 14 ventilation and lock doors were restored and commissioned;
- Based on the findings of individual radiation exposure monitoring, employees were replaced in a timely manner when exposure reached the reference level of 16.0 mSv.

At the leach plant of PIMCU, PJSC, a low level of volumetric activity in the air in workspaces was maintained by implementing technical measures to improve exhaust and supply ventilation: removing dust from air ducts (at least three times a year), replacing leaking air ducts; continuous irrigation of ore; stricter administrative measures, and the introduction of preventive measures.

The following measures were taken to improve radiation safety:

- Furnace repairs (replacement of a retort, rollers, bearings, repairs to the bunker, lids, the drive and furnace power supply units);
- Dust and technological products removal and washing of intake and exhaust air ducts;
- Scheduled decontamination of equipment and surfaces in workrooms;
- Daily wet cleaning of calcination and finished product packing rooms;
- Decontamination of equipment and surfaces in the furnace and packing rooms involving a process shutdown (May 2020);
- Overhaul of the sorption tank and the leaching agitation tank.

In the past year, no facilities posing nuclear and radiation hazards were decommissioned or liquidated in the operating organisations of JSC Atomredmetzoloto.

GRI 303–1

9.2 Environmental safety

Water use and discharge

Water withdrawal in the Holding's enterprises in 2018-2020 by purpose, million m³

Enterprise	Water withdrawal for operational needs			Water withdrawal for drinking and sanitary purposes			Total water withdrawal			Groundwater			Exceeding the established limits		
	2018	2019	2020	2018	2019	2020	2018	2019	2020	2018	2019	2020	2018	2019	2020
PIMCU, PJSC	23.289	24.860	22.310	5.411	7.144	5.966	35.269	34.398	33.411	29.973	28.898	28.011	0	0	0
Dalur JSC	0.055	0.054	0.056	0.046	0.042	0.044	0.100	0.096	0.100	0.100	0.096	0.100	0	0	0
Khiagda JSC	0.154	0.195	0.207	0.038	0.046	0.031	0.196	0.247	0.244	0.196	0.242	0.239	0	0	0

The main indicator of water consumption savings is the full use of drainage waters of the Urtuysky mine and mine waters of the uranium mining production in the technical water supply. The mine waters of the uranium mining production are supplied in full for the technical water supply of the LP. Drainage water from the Urtuysky brown coal mine is used at the CHPP and other subdivisions of PIMCU, PJSC. Efficient use of water resources in production reduces the volume of water withdrawal from natural sources.

At PIMCU, PJSC, a 16.5% decrease in water withdrawal for drinking and sanitary purposes was due to decreased water consumption at production facilities.

At Khiagda JSC, the volume of water consumption decreased by 3,240 m³ year on year due to the use of treated wastewater in the technological process of preparing working (leaching) solutions. The decrease in water withdrawal for drinking and sanitary needs is associated with a decrease in the number of working personnel.

At Dalur JSC, water withdrawal remained unchanged year on year in 2020.

Wastewater discharge

GRI 306–1

PIMCU, PJSC

Wastewater discharge at PIMCU, PJSC in 2018–2020, million m³

GRI 303–4

	2018	2019	2020
Wastewater discharge	10.74	10.145	10.318

The volume of water discharge in 2020 increased by 1.71% year on year.

Khiagda JSC and Dalur JSC

Due to the closed process cycle, the enterprises discharge no wastewater containing hazardous chemicals or radionuclides.

Domestic wastewater from the sewerage system is transported to wastewater treatment facilities of a specialised enterprise under a contract.

Air protection

GRI 305–7

Pollutant emissions into the atmosphere from PIMCU, PJSC in 2018–2020, tonnes

Pollutant name	2018	2019	2020
Carbon monoxide	306.845	333.798	321.477
Sulphur dioxide	4,870.216	5,125.116	5,924.726
Nitrogen oxides (in NO_2 equivalent)	1,550.732	1,673.346	1,657.578
Specific pollutants	7,033.061	7,543.806	9,308.079
Total	**14,588.58**	**14,708.81**	**17,211.860**

In 2020, there was an increase in pollutant emissions by 14.543% year on year, due to a change in the physical and chemical properties of coal supplied to the CHPP.

Pollutant emissions in 2020 were 31.30% below the permitted level.

Pollutant emissions into the atmosphere from Khiagda JSC in 2018–2020, tonnes

Pollutant name	2018	2019	2020
Carbon monoxide	9.722	4.258	5.25
Sulpfur dioxide	302.74	299.863	300.293
Nitrogen oxides (in NO_2 equivalent)	10.662	7.737	4.968
Specific pollutants	22.56	23.256	44.362
Other	2.714	19.091	-
Total	**348.40**	**354.205**	**354.873**

Actual emissions from sources of pollution did not exceed permitted limits.

Pollutant emissions into the atmosphere from Dalur JSC in 2018–2020, tonnes

Pollutant name	2018	2019	2020
Carbon monoxide	1.207	2.43	0.046
Sulpfur dioxide	0.0071	0.005	0
Nitrogen oxides (in NO_2 equivalent)	0.06803	0.49	0.205
Specific pollutants	1.3827	1.612	0.58035
Other			
Total	**2.8093**	**4.537**	**0.866**

The sharp decrease in emissions in 2020 is due to a change in the methodology for recalculating the maximum permitted emission standards for 2020-2026; some standards for chemical pollutants decreased by 4 times compared to the standards for 2015-2019. Thus, it is inappropriate to describe the actual decrease in emissions in 2020 compared to 2019.

Waste management

GRI 306–1
GRI 306–2
GRI 306–3
GRI 306–5

Generation of waste of all hazard classes in 2018–2020, tonnes

Hazard class	Year	PIMCU, PJSC	Dalur JSC	Khiagda JSC
Hazard class 1	2018	3.534	0.105	0.063
	2019	1.778	0.217	0.117
	2020	2.873	0.143	0.056
Hazard class 2	2018	9.487	1.127	1.166
	2019	1.195	0.97	2.178
	2020	8.383	1.368	1.929
Hazard class 3	2018	96.05	1.770	1.865
	2019	86.973	1.748	7.447
	2020	79.501	2.576	8.498
Hazard class 4	2018	1,710.6	52.987	491.5
	2019	861.5	68.824	220.434
	2020	569.719	106.84	190.3
Hazard class 5	2018	15,617 944.40	23.45	69
	2019	17,252 387.00	12.654	54.7
	2020	22,289 456.89	18.131	40.3
Total	**2018**	**15,619 764.07**	**79.439**	**563.54**
	2019	**17,253 338.45**	**84.413**	**284.876**
	2020	**22,290 117.36**	**129.058**	**241.083**
Waste used in the enterprise or stored on site, tonnes	2019	184,272.2	0	111.2
	2020	197,138	0	89.1
Waste transferred to specialised contractors for recycling and treatment, tonnes	2019	13.059	16.894	173.968
	2020	9.758	2.639	31.899
Exceeding the established limits	2019	None	None	None
	2020	-	None	-

PIMCU, PJSC

- An increase in generation of hazard class 1 waste (mercury light bulbs) by 1.436 tonnes was due to the replacement of mercury light bulbs with LED light bulbs;
- An increase in generation of hazard class 2 waste was due to the rarely generated used iron nickel batteries, the amount of waste generated was 3.013 tonnes, this type of waste is generated less often than once every 5 years;
- An increase in generation of undamaged used lead batteries with electrolyte by 4.175 tonnes was due to the replacement of accumulator batteries;
- A reduction in generation of hazard class 4 waste by 366.2 tonnes was due to a decrease in the generation of used molding sand, since this type of waste is reused during the foundry process;
- An increase in generation of hazard class 5 waste was due to an increase in the volume of overburden of the Urtuysky brown coal mine, since it is the main type of hazard class 5 waste. The amount of waste generated in 2019 was 16,945,500.0 tonnes, in 2020 – 22,049,400.0 tonnes, with a 23.14% increase. There was also an increase in the generation of bottom ash from the burning of Urtui coal: 197,857.6 tonnes in 2019, 238,621.0 tonnes in 2020, an increase of 40,763.4 tonnes (i.e. 20.6%.).

Dalur JSC

Waste generation in 2020 totalled 129.058 tonnes, which is 44.645 tonnes more than in 2019.

A year-on-year increase in waste generation was due to an increase in the generation of waste:

- Polyethylene containers contaminated with inorganic insoluble or slightly soluble mineral substances (in 2019, hydrofluoric acid was supplied in barrels, in 2020, in canisters);
- Plastic waste mixture contaminated with organomineral fertilisers (in 2019, they were supplied in big bags, in 2020 in bags of 50 or 25 kg).

Khiagda JSC

- A reduction in the generation of hazard class 1 waste was due to the implementation of the energy efficiency programme of the enterprise by replacing mercury, mercury-quartz, fluorescent lamps with LED ones, provided through the own production of LED lamps at Khiagda JSC, which should ultimately completely exclude the use of mercury containing lamps and, as a result, the generation of hazard class 1 waste at the enterprise;
- An increase in the generation of hazard class 3 waste was due to an increase in the volume of transportation by road, an increase in the operating hours of special vehicles and the annual mileage of vehicles, and therefore an increase in oil changes. As a result, the generation of oily waste increased;
- A reduction in the generation of hazard class 4 waste was mainly due to a decrease in the generation of polymer materials (containers and packaging from chemical reagents) by replacing the type of polymer sacks.

Protection of land and biodiversity

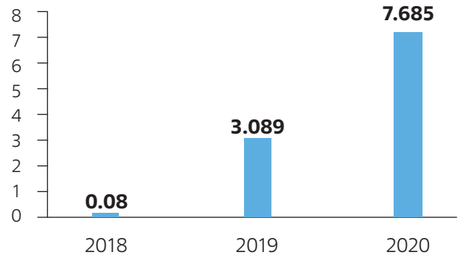
GRI 304–3

PIMCU, PJSC

The increase in the area of disturbed lands is due to the reconstruction of heap leaching sites and a waste rock dump site.

No land reclamation measures were implemented in 2020.

Total area of land disturbed at PIMCU, PJSC in 2018–2020, ha



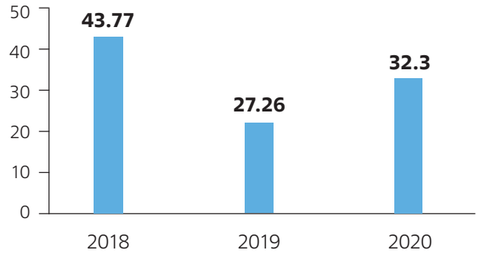
Khiagda JSC

In 2020, the area of land disturbed at Khiagda JSC totalled 32.3 ha, including:

- 21 ha disturbed during the mining of mineral deposits of the Khiagda ore field;
- 4.2 ha disturbed during mining at the Vershinnoye deposit of the Khiagda ore field;
- 1.1 ha disturbed during construction work at the Istochnoye deposit of the Khiagda ore field;
- 6.0 ha disturbed during construction work at the Khiagdinskoye deposit of the Khiagda ore field.

Land reclamation is scheduled after completion of bodies and deposits development.

Total area of land disturbed at Khiagda JSC in 2018–2020, ha

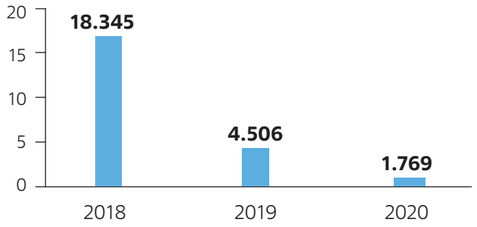


Dalur JSC

At Dalur JSC, damage to topsoil was caused by preparation of construction sites for construction and installation.

The topsoil removed at the sites will be replaced at the final stage of construction, during the improvement of the area surrounding the constructed facilities and during the rehabilitation of areas contaminated as a result of the work.

Total area of land disturbed at Dalur JSC in 2018–2020, ha



Environmental costs

RUB 492.8 million was spent in total on measures implemented in the reporting year to protect the environment and reduce the negative environmental impact, using all sources of financing, including the federal budget.

GRI 307–1

Environmental costs in 2020, RUB '000

Measures	PIMCU, PJSC	Dalur JSC	Khiagda JSC	Total
Current (operating) expenses, RUB '000	180,202.00	886.00	82,598.00	263,686.00
Payment for environmental services	4,161.00	9,909.00	12,214.00	26,284.00
Environmental costs associated with major repairs of fixed assets, RUB '000	153,884.00	–	–	153,884.00
Environmental investments in fixed assets, RUB '000	11,113.00	–	34,122.00	45,235.00
Charges for the negative impact on the environment, RUB '000	3,479.00	3.702	61.00	3,543.702

In PIMCU, PJSC, the increase in costs by 68% was due to an increase in the cost of capital repairs of CHPP fixed assets for environmental protection.

In Khiagda JSC, the increase in environmental costs was due to an increase in the payroll for employees of the repair and restoration work site who carry out measures to collect solutions during repair and restoration works at technological wells of the mining sites within the operating deposits of the Khiagda ore field in order to prevent soil surface contamination and pollution of the hydrographic network and the aquifer.

In Dalur JSC, the increase in environmental costs was due to an increase in wages of ecologists.

9.3 Environmental programmes

GRI 103–1

The Division attaches equal importance to environmental safety of its enterprises and improving the efficiency of uranium production.

The priority is to comply with legal requirements for environmental protection and protection of the population against radiation exposure.

GRI 103–2

To achieve this, the Division implements the following environmental measures on an annual basis:

- Developing and ensuring the stable functioning of an integrated management system compliant with the ISO 9001:2015 and ISO 14001:2015 standards;
- Continuously maintaining the required level of environmental education for environmental safety decision-makers;
- Radiation and environmental monitoring of industrial sites and buffer areas;
- Replacing mercury-containing light bulbs with LED light bulbs.

PIMCU, PJSC

Measures taken to reduce the negative impact included:

- Use of drainage water from the Urtuysky mine and mine water from underground mines No. 1 and No. 8 as an additional source of process water to reduce the withdrawal of natural water from the Argun River;
- Use of inorganic dust: 70–20% SiO2 (waste from coal combustion) as a component of backfill mixture for filling in depleted mine workings at underground mines No. 1 and No. 8;
- Transfer of mercury-containing lamps and hazard class 1 to 3 waste to a specialised organisation for processing and utilisation;
- Timely equipment maintenance and repairs;
- Collection and storage of radioactive waste in a specialised storage facility;
- Research on the use of solid components of tailings pulp from the LP for paste backfilling in underground uranium mines;
- Monitoring of emissions, discharges, the state of atmospheric air, surface and ground waters, soil and vegetation.

Khiagda JSC

In 2019 and 2020, Khiagda JSC implemented a project to preserve the biodiversity of Lake Baikal, which contributed to the implementation of the Preservation of Lake Baikal Federal Project forming part of the Ecology National Project.

For details, see Section 3.2. 'Key sustainable development projects'.

Chapter 10

RISKS SPECIFIC TO THE DIVISION AND MANAGEMENT APPROACHES

GRI 102–15

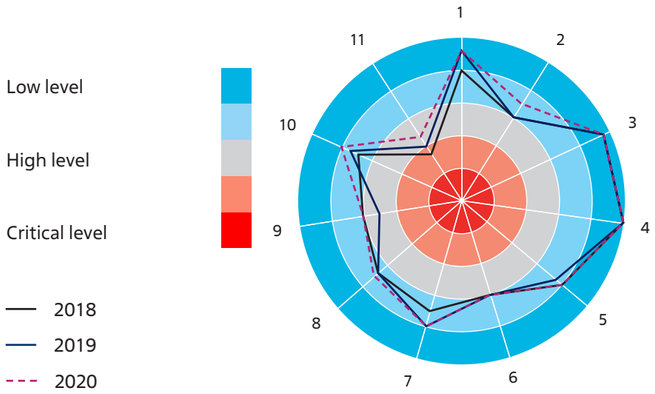
10.1 Risk management system

GRI 103–2

As part of a single approach adopted across ROSATOM, JSC Atomredmetzoloto has formed a risk management system integrated into planning and management processes. The risk management system is based on a cyclical process of identifying, assessing and managing the risks that can affect the Company's results and performance indicators.

In 2020, JSC Atomredmetzoloto successfully confirmed the compliance of its activities, including risk management, with the ISO 9001:2015 and ISO 14001:2015 international standards.

JSC Atomredmetzoloto risk radar



1. Currency risk
2. Credit risk
3. Liquidity risk
4. Commodity risk (uranium)
5. Health, safety and environmental (HSE) risk
6. Risk of loss of and damage to assets (corruption and other offences leading to a damage to/loss of assets)
7. Reputational risk
8. Personnel risk
9. Social risks, including risk of deteriorating epidemiological situation
10. Investment projects risk (uranium)
11. New investment projects risk

10.2 Key risks and risk management results

Key risks and risk management procedures in 2020

Change in risk level: ↑ increase ↓ decrease ○ no significant changes

Risk, its number on the Radar and key risk factor	Risk management practices in 2020	Change in risk level
1. Currency risk (adverse changes in exchange rates)	**Management approaches:** ■ Maintaining a balance of claims and liabilities denominated in foreign currencies (natural hedging); ■ Monitoring the terms of foreign currency payments under revenue contracts and expense contracts concluded as part of performance of revenue contracts; ■ Using currency clauses in contracts denominated in foreign currencies. **Results:** an optimal ratio of assets and liabilities denominated in the same currency was maintained, the impact of the risk on the Division's financial performance was minimised. **Change forecast:** due to significant exchange rate volatility in 2020, the risk is expected to increase in 2021.	↓
2. Credit risk (failure by counterparties to fulfil their obligations in full and on time)	**Management approaches:** ■ Payments for products supplied by the Division are made through anchor banks within the limits for counterparty banks established by ROSATOM; ■ Using suretyship, guarantees, penalties, bank control over the transit of payment to the final manufacturer, restrictions on advance payments and payment time limits under contracts with external counterparties; ■ Monitoring the status of accounts receivable and the financial position of counterparties; ■ An internal counterparty solvency rating system. The main buyers of uranium products produced at the Division's enterprises are ROSATOM companies, which significantly reduces credit risk. Non-uranium products (utility systems, gold, engineering and drilling, coal) are sold to counterparties with a low level of default (municipal contracts) and using prepayment.	○

Risk, its number on the Radar and key risk factor	Risk management practices in 2020	Change in risk level
	Results: there were no significant losses through the fault of counterparties. **Change forecast:** in connection with the development of new business areas and associated involvement of external counterparties not conventional for the Division (including small and medium-sized enterprises), an increase in risk is possible in.	
3. Liquidity risk (lack of funds for the fulfilment of obligations by the Division)	**Management approaches:** Liquidity risks did not have any significant impact on the activities of JSC Atomredmetzoloto due to the implementation of a consistent policy to manage this type of risk during the year, which included: ■ Rolling liquidity forecasts and cash flow budget; ■ Managing the Division's intragroup loan portfolio, reducing the period of keeping spare cash on bank deposits when this is advisable from an economic perspective, obtaining liquid funds through funds and forms of state support, flexible centralised cash consolidation and distribution to support economic activities of the Division's subsidiaries (cash pooling). **Results:** the Division maintained an optimal ratio of liquidity sufficient to repay liabilities on time, preventing losses and reputational risk. **Change forecast:** taking into account the preservation of the system of centralised liquidity management of the Division's organisations through FRC-2, no risk growth is expected in 2021.	○
4. Commodity risk (decline in uranium prices)	The transition to fixed uranium sales prices within the corporation allowed the risk of changes in uranium quotations to be concentrated at processing enterprises. The impact of this risk on the Division's performance was completely offset. **Result:** the impact of this risk on the Division's financial performance was completely offset. **Change forecast:** the risk will be completely offset.	○

Risk, its number on the Radar and key risk factor	Risk management practices in 2020	Change in risk level
5. Health, safety and environmental (HSE) risk (major accidents/incidents at nuclear enterprises)	**Management approaches:** ■ Implementation of the programme to upgrade process equipment at the Division's enterprises; ■ Strict control of compliance with current standards in the production and technological process; ■ Training activities to improve the safety culture among personnel; ■ Arranging civil liability insurance against damage caused by the Division's organisations to third parties. In order to maintain the balance of local ecosystems, all enterprises of the Division participating in various stages of the production process strictly observe the technological standards for natural uranium mining and processing. An active policy is being pursued to reduce such impact and improve the environmental safety of the production cycle. **Results:** safe operation of the enterprises and hazardous industrial facilities was ensured. **Change forecast:** taking into account the measures taken, the risk is expected to decrease in 2021.	○
6. Risk of loss of and damage to assets (corruption and other offences leading to damage to/loss of assets)	**Management approaches:** The Holding maintains a system for combating corruption and other offenses, including preventive anti-corruption measures, ROSATOM hotline is in place, anti-corruption standards and appropriate restrictions have been introduced. Procurement activities of all organisations of the Holding are carried out in strict compliance with the ROSATOM unified industry-wide procurement standard. **Result:** preventive measures were taken and inspections were carried out on a systematic basis to protect assets.	○
7. Reputational risk (changes in stakeholder perception of the trustworthiness and appeal of the Division)	**Management approaches:** The Mining Division is constantly working to shape a positive public opinion on the development of nuclear technologies, including uranium mining, through improved information transparency and open stakeholder engagement, including wide coverage of the development plans and terms of the Division's enterprises, performance results and environmental monitoring results in the media and on social media.	○

GRI 205–1
GRI 205–2

Risk, its number on the Radar and key risk factor	Risk management practices in 2020	Change in risk level
	Result: according to the Levada Centre survey, at the beginning of 2021, 61.4% of the population (56.6% in 2020) supported the use of nuclear energy. Support for uranium projects by the state authorities continues both at the regional and federal levels. **Change forecast:** the risk is expected to remain at the achieved level in 2021.	
8. Personnel risk (lack of personnel in the regions of operation, drop in qualifications)	**Management approaches:** ■ The Division implements a programme to engage employees with experience in the mining industry from other regions, a programme to engage highly qualified employees from related industries; ■ A progressive system of remuneration, benefits and social guarantees for employees is used to retain qualified personnel; ■ The Division implements a comprehensive programme to train personnel at all levels, including an executive succession pool programme; ■ The Division's enterprises are actively involved in the development of infrastructure in the regions of operation; ■ Succession plans for key positions in the Division have been formed. **Result:** the Division managed to stabilise the overall employee turnover rate of mining enterprises at the level of 11-12%. **Change forecast:** the risk is expected to remain at the achieved level in 2021.	○
9. Sociopolitical risk in the regions of operation, including the risk of a deteriorating epidemiological situation (exacerbation of social tension in the town of Krasnokamensk)	**Management approaches:** Implementation of the project 'Development of the Argunskoye and Zherlovoye deposits. The construction of Mine No. 6 in the Zabaykalsky Territory', supported by regional and federal authorities, made it possible to significantly reduce the anxiety of local residents and maintain social peace in the region in terms of the development of the town of Krasnokamensk and operational stability at the enterprise.	↑

Risk, its number on the Radar and key risk factor	Risk management practices in 2020	Change in risk level
	To prevent a deterioration in the epidemiological situation, the Division fully complied with all requirements for public sanitation and disease prevention amid the spread of the new coronavirus disease (COVID-19) and recommendations by the Federal Service for Surveillance on Consumer Rights Protection and Human Wellbeing (Rospotrebnadzor); in addition, the following measures were implemented: ■ During non-working days, teams were formed in organisations in Moscow to ensure the continuity of core processes at the workplace with minimal risk to employees; manufacturing enterprises in the regions continued to operate, but measures were taken to protect employees against COVID-19; ■ Employees working remotely were provided with computers; ■ Physical contact among employees at the workplace was minimised; ■ Temperature checks were arranged at the entrance to the premises of the organisations; ■ COVID and antibody testing of employees was arranged; ■ Employees were provided with means of protection (face masks, gloves, hand sanitisers). **Result:** despite a challenging epidemiological situation, the atmosphere in the towns and cities of operation remained calm, and the Division successfully ensured operational continuity in its enterprises. **Change forecast:** no risk growth is expected in 2021.	
10. Investment projects risk – uranium (risk of failure to achieve project goals)	**Management approaches:** ■ Maintaining stable operation of the mining and service enterprises of the Division amid restrictive measures introduced due to the spread of the coronavirus infection COVID-19; ■ 100% fulfillment of obligations to supply uranium products to ROSATOM organisations; ■ Fulfilling obligations to Russian federal authorities in compliance with the project implementation schedules under the investment agreements concluded as part of the approved state programmes and Decrees of the Government of the Russian Federation. **Result:** the efficiency of the uranium mining projects portfolio of the Mining Division, confirmed by ROSATOM, remains at a consistently positive level. **Change forecast:** risk reduction is expected in 2021.	↓

Risk, its number on the Radar and key risk factor	Risk management practices in 2020	Change in risk level
11. New investment projects and businesses risk (risk of failure to achieve project goals)	**Management approaches:** Entering new mining businesses is associated with capital intensity and a long investment phase (a phase with great uncertainty), and long payback periods for projects. When making a decision to enter a new business, JSC Atomredmetzoloto considers the restrictions put by its main shareholder, expressed in minimising the impact on ROSATOM's consolidated investment resource, with optimal risks inherent to the development of new markets and new types of products. For this purpose, the implementation of new projects involves obtaining budgetary and regional financing (to minimise the risk of default on a counterparty), monitoring the status of accounts receivable and the financial position of counterparties, using financial risks mitigation tools (banking support, letters of credit, independent bank guarantees, compliance with minimum payment deferral terms, etc.). The main risks in 2020 included: lack of competencies, the occurrence of unforeseen costs in connection with the development of mineral deposits in hard-to-reach areas of the Far North and the Arctic, delays in passing state examinations due to non-standard technological solutions: these factors led to the postponement of project implementation and the failure to receive expected income from new businesses. **Result:** as the project goes forward, key risks of the project are monitored (risk probability and exposure are assessed) and risk management measures are adjusted. Risk analysis data is taken into account when choosing alternative strategies and making adjustments to the project for its successful implementation. **Change forecast:** in connection with the accumulation of competencies in new business markets, a reduction in risk is expected in 2021.	↓

Risk insurance

In order to reduce production and social risks, insurance is actively used:

- Insurance of enterprises' property, cargo insurance during transportation;
- Civil liability insurance for the carriage of goods, capital construction activities, as well as compulsory types of civil liability insurance;
- Personal insurance in order to ensure social protection of the Division's employees: voluntary medical insurance, accident and health insurance.

In 2021, it is planned to continue using insurance as a method of reducing risks.

10.3 Plans for 2021 and for the medium term

The work plan for the development of the Mining Division's risk management system is directly related to the work plan for the development of ROSATOM's integrated risk management system.

Main objectives for 2021:

- Develop corporate-wide risk management processes in terms of updating qualitative approaches to determining Risk Appetite, distribution of Risk Appetite among the divisions taking into account their profile;
- Develop an automated risk assessment and management system, which will, among other things, enable the Division to maintain and update a knowledge base of typical risks and risk management measures;
- Develop the risk management expert community in the Division;
- Develop procedures (including initial assessment) for managing risks associated with projects and programmes in the area of business (new businesses) development;
- Determine the approach to risk management of investment projects, develop, test and integrate it with the investment management process;
- Manage risks of procurement processes;
- Manage personnel, social and reputational risks.

Information on the Reporting Process

GRI 102–45

This Appendix, Performance of the Mining Division in 2020 (hereinafter referred to as the Appendix), forms part of the 2020 public annual report of ROSATOM.

Disclosure boundaries

GRI 102–50
GRI 102–51
GRI 102–52

The Appendix describes the performance results of the Mining Division from January 1, 2020 to December 31, 2020.

The report covers all major companies managed by the Holding.

Standards and regulatory requirements used during the preparation of the Appendix

Process for drafting the Appendix and determining its content

GRI 102–43
GRI 102–46

Preparation of the Report included an analysis of the Holding's operations in 2020. The appendix format makes it possible to demonstrate the Company's performance in the economic, social and environmental context. During the preparation of the Appendix, a questionnaire survey of internal and external stakeholders was conducted in order to update the matrix of material topics.

GRI 102–54

Information was collected for the Appendix using special technical inquiries in compliance with the GRI requirements, taking into account the findings of a materiality assessment.

The Appendix also reflects the Company's impact on its stakeholders. The Appendix preparation was carried out and supervised by the Corporate Communication Department in close cooperation with them.

In January 2021, a questionnaire survey was conducted to identify material topics to be disclosed in the Appendix.

On February 12, 2021, two dialogues were held to discuss the prioritised topic.

On May 12, 2021, in-person public consultations were held to discuss the draft Appendix.

Process for determining the materiality of information

GRI 102–47

In January 2021, in accordance with the GRI Sustainability Reporting Standards (SRS), the Holding conducted a questionnaire survey among stakeholder representatives in order to prioritise material topics.

Prioritised topic of the Appendix:
Diversification of the Mining Division's business as a sustainable development factor

It was suggested in the questionnaire that respondents should select from a complete list of 45 topics those topics that they think should be disclosed in the Appendix as a matter of priority. Respondents were asked to assess the importance of each topic using a four-point scale (the highest materiality, high, medium and low materiality) and make their own suggestions for material topics.

GRI 102–49

There are no significant changes in the scope or boundaries of material topics as compared to previous reports. The topic boundaries and the content of the Appendix have been determined taking into account the views of stakeholders and agreed by departments of JSC Atomredmetzoloto. The Appendix does not cover any topics that are not considered material.

Performance indicators presented in the Appendix have the following scope:

- Operating indicators are presented based on data on the following assets: PIMCU, PJSC; Dalur JSC; Khiagda JSC; RUSBURMASH JSC; VNIPIPT JSC;
- Environmental indicators: PIMCU, PJSC; Dalur JSC; Khiagda JSC;
- Personnel and occupational safety indicators: JSC Atomredmetzoloto; PIMCU, PJSC; Dalur JSC; Khiagda JSC; RUSBURMASH JSC; VNIPIPT JSC; ARMZ Service LLC;
- Financial indicators: JSC Atomredmetzoloto; PIMCU, PJSC; Dalur JSC; Khiagda JSC; VNIPIPT JSC; RUSBURMASH JSC; ARMZ Service LLC; Elkon MMP JSC; EGMK-Project JSC;
- Energy efficiency indicators (energy consumption within the organisation): JSC Atomredmetzoloto.

Disclaimer

GRI 102–56

The report contains forward-looking statements regarding operating, financial, economic and social indicators characterising the Company's future development. The materialisation of assumptions and plans is directly related to the political, economic, social and legal environment. As a result, the Company's actual performance may differ from the forward-looking statements.

Additional Information

GRI Index

Indicator	Chapter/Comment
GRI 101: Foundation (2016)	
GRI 102: General Disclosures (2016)	
Organisational profile	
102-1 Name of the organisation	Chapter 1. Overview of the Mining Division
102-2 Activities, brands, products, and services	Chapter 1. Overview of the Mining Division Chapter 6. New Products and Businesses
102-3 Location of headquarters	Contacts
102-4 Location of operations	Chapter 1. Overview of the Mining Division Chapter 6. New Products and Businesses
102-5 Ownership and legal form	Chapter 1. Overview of the Mining Division
102-6 Markets served	Chapter 6. New Products and Businesses
102-7 Scale of the organisation	Chapter 2. Key Results and Events in the Reporting Year
102-8 Information on employees and other workers	Chapter 7. Developing the Human Capital
102-9 Supply chain	Chapter 1. Overview of the Mining Division
102-11 Precautionary Principle or approach	Chapter 7. Developing the Human Capital
102-12 External initiatives	Chapter 1. Overview of the Mining Division
Strategy	
102-14 Statement from senior decision-maker	Statement from the Head of the Division
102-15 Key impacts, risks, and opportunities	Chapter 1. Overview of the Mining Division Chapter 10. Risks Specific to the Division and Management Approaches
Ethics and integrity	
102-16 Values, principles, standards, and norms of behaviour	Chapter 1. Overview of the Mining Division Chapter 3. Sustainable Development
102-17 Mechanisms for advice and concerns about ethics	Chapter 1. Overview of the Mining Division
Governance	
102-18 Governance structure	Chapter 1. Overview of the Mining Division
102-22 Composition of the highest governance body and its committees	Chapter 1. Overview of the Mining Division
102-23 Chair of the highest governance body	Chapter 1. Overview of the Mining Division
Stakeholder engagement	
102-40 List of stakeholder groups	See the 2020 public annual report of ROSATOM
102-41 Collective bargaining agreements	Chapter 7. Developing the Human Capital
102-42 Identifying and selecting stakeholders	See the 2020 public annual report of ROSATOM
102-43 Approach to stakeholder engagement	Information on the Reporting Process
Report profile	
102-45 Entities included in the consolidated financial statements	Information on the Reporting Process
102-46 Defining report content and topic Boundaries	Information on the Reporting Process
102-47 List of material topics	Information on the Reporting Process
102-49 Changes in reporting	Information on the Reporting Process
102-50 Reporting period	Information on the Reporting Process
102-51 Date of most recent report	Information on the Reporting Process
102-52 Reporting cycle	Information on the Reporting Process
102-53 Contact point for questions regarding the report	Contacts
102-54 Claims of reporting in accordance with the GRI Standards	Information on the Reporting Process
102-55 GRI content index	GRI Index
102-56 External assurance	Information on the Reporting Process
GRI 201: Economic Performance (2016)	
GRI 103: Management Approach (2016)	Chapter 2. Key Results and Events in the Reporting Year
201-1 Direct economic value generated and distributed	Chapter 2. Key Results and Events in the Reporting Year Chapter 8. Developing the Regions of Operation

Indicator	Chapter/Comment
201-3 Defined benefit plan obligations and other retirement plans	Chapter 7. Developing the Human Capital
GRI 202: Market Presence (2016)	
GRI 103: Management Approach (2016)	Chapter 7. Developing the Human Capital Chapter 8. Developing the Regions of Operation
202-1 Ratios of standard entry level wage by gender compared to local minimum wage	Chapter 7. Developing the Human Capital
202-2 Proportion of senior management hired from the local community	Chapter 8. Developing the Regions of Operation
GRI 203: Indirect Economic Impacts (2016)	
GRI 103: Management Approach (2016)	Chapter 8. Developing the Regions of Operation
203-1 Infrastructure investments and services supported	Chapter 8. Developing the Regions of Operation
203-2 Significant indirect economic impacts	Chapter 8. Developing the Regions of Operation
GRI 205: Anti-Corruption	
205-1 Operations assessed for risks related to corruption	Chapter 10. Risks Specific to the Division and Management Approaches
205-2 Communication and training about anti-corruption policies and procedures	Chapter 10. Risks Specific to the Division and Management Approaches
GRI 302: Energy (2016)	
302-1 Energy consumption within the organisation	Data on the volume of energy sold and total energy consumption are not disclosed due to the lack of a centralised accounting system.
302-2 Energy consumption outside of the organisation	There is no system for recording information on energy consumption in the supply chain or in the consumption chain.
302-3 Energy intensity	Not calculated because total energy consumption is not calculated.
302-5 Reductions in energy requirements of products and services	Not applicable.
GRI 303: Water and Effluents (2018)	
303-1 Interactions with water as a shared resource	Chapter 9. Safety of Operations
303-4 Water discharge	Chapter 9. Safety of Operations
GRI 304: Biodiversity (2016)	
304-3 Habitats protected or restored	Chapter 9. Safety of Operations

Indicator	Chapter/Comment
GRI 305: Emissions (2016)	
305-2 Energy indirect (Scope 2) GHG emissions	Not calculated, as the Division does not have the relevant accounting system.
305-3 Other indirect (Scope 3) GHG emissions	Not calculated, as the Division does not have the relevant accounting system.
305-5 Reduction of GHG emissions	The greenhouse gas emission reduction as a result of reduction initiatives is not calculated.
305-7 Nitrogen oxides (NO_x), sulpfur oxides (SO_x), and other significant air emissions	Chapter 9. Safety of Operations
GRI 306: Effluents and Waste (2016)	
306-1 Water discharge by quality and destination	Chapter 9. Safety of Operations
306-2 Waste by type and disposal method	Chapter 9. Safety of Operations
306-3 Significant spills	Chapter 9. Safety of Operations
306-4 Transport of hazardous waste	The Company's enterprises are not involved in transboundary waste movement. The Holding's enterprises do not transport, process or transfer for recycling any waste deemed hazardous under the Basel Convention.
306-5 Water bodies affected by water discharges and/or runoff	Wastewater discharges do not have a significant impact on the biodiversity value of water bodies or related habitats.
GRI 307: Environmental Compliance (2016)	
307-1 Non-compliance with environmental laws and regulations	Chapter 9. Safety of Operations
GRI 401: Employment (2016)	
GRI 103: Management Approach (2016)	Chapter 7. Developing the Human Capital
401-1 New employee hires and employee turnover	Chapter 7. Developing the Human Capital
401-2 Benefits provided to full-time employees that are not provided to temporary or part-time employees	Part-time employees are provided with all benefits if the Division is their primary place of employment.
401-3 Parental leave	There is no centralised accounting system.
GRI 403: Occupational Health and Safety (2018)	
GRI 103: Management Approach (2016)	Chapter 7. Developing the Human Capital
403-2 Hazard identification, risk assessment, and incident investigation	No breakdown by gender is provided. No information is provided on injury rates in contractor organisation, as there is no system for collecting and recording such data.

Indicator	Chapter/Comment
403-7 Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	Chapter 7. Developing the Human Capital
403-9 Work-related injuries	Chapter 7. Developing the Human Capital
403-10 Work-related ill health	Chapter 7. Developing the Human Capital
GRI 404: Training and Education (2016)	
GRI 103: Management Approach (2016)	Chapter 7. Developing the Human Capital
404-1 Average hours of training per year per employee	The number of training hours by gender is not disclosed as the relevant information is not recorded.
404-2 Programmes for upgrading employee skills and transition assistance programmes	Chapter 7. Developing the Human Capital
404-3 Percentage of employees receiving regular performance and career development reviews	No breakdown by gender is provided due to the lack of accounting system.
GRI 405: Diversity and Equal Opportunity (2016)	
405-1 Diversity of governance bodies and employees	Chapter 7. Developing the Human Capital
405-2 Ratio of basic salary and remuneration of women to men	Chapter 7. Developing the Human Capital
GRI 413: Local Communities (2016)	
GRI 103: Management Approach (2016)	Chapter 8. Developing the Regions of Operation
413-1 Operations with local community engagement, impact assessments, and development programmes	Chapter 8. Developing the Regions of Operation
413-2 Operations with significant actual and potential negative impacts on local communities	There are no significant negative impacts.
GRI 415: Public Policy (2016)	
415-1 Political contributions	In 2020, JSC Atomredmetzoloto provided no support to commercial organisations, provided no financial support (made no donations) to political parties, and did not participate in the development or lobbying of public policies.
GRI 416: Customer Health and Safety (2016)	
416-1 Assessment of the health and safety impacts of product and service categories	JSC Atomredmetzoloto conducts an annual quality assessment of its products to identify opportunities for improvement.

Indicator	Chapter/Comment
416-2 Incidents of non-compliance concerning the health and safety impacts of products and services	In 2020, JSC Atomredmetzoloto and its subsidiaries recorded no incidents of non-compliance with regulations or voluntary codes concerning the health and safety impacts of products and services, by type of consequences.
GRI 417: Marketing and Labeling (2016)	
417-1 Requirements for product and service information and labeling	The Company's internal policies and procedures require product labelling indicating the sources of origin, composition, conditions of use and disposal.
417-2 Incidents of non-compliance concerning product and service information and labeling	In 2020, JSC Atomredmetzoloto and its subsidiaries recorded no incidents of non-compliance with regulations or voluntary codes concerning product and service information and labeling, by type of consequences.
417-3 Incidents of non-compliance concerning marketing communications	In 2020, JSC Atomredmetzoloto and its subsidiaries recorded no incidents of non-compliance with regulations or voluntary codes concerning marketing communications, including product advertising and promotion and sponsorship, by type of consequences.
GRI 418: Customer Privacy (2016)	
418-1 Substantiated complaints concerning breaches of customer privacy and losses of customer data	In 2020, JSC Atomredmetzoloto and its subsidiaries received no substantiated complaints concerning breaches of customer privacy or losses of customer data.
GRI 419: Socioeconomic Compliance (2016)	
419-1 Non-compliance with laws and regulations in the social and economic area	In 2020, there were no significant violations of the law by JSC Atomredmetzoloto or its subsidiaries; no significant fines or sanctions were imposed on the Company.

Abbreviations

CSR	corporate social responsibility
CT	critical tasks
CTG	consolidated taxpayer group
EW	exploration work
FEED	front-end engineering design
GRI	Global Reporting Initiative
HL	heap leaching
ISRS	integrated standardised remuneration system
KPI	key performance indicator
LDR	lost day rate
LP	leach plant
LSU	local sorption unit
MRB	mineral resource base
ODR	occupational disease rate
R&M	repairs and maintenance
RAW	radioactive waste
REM	rare-earth metals
RPS	ROSATOM Production System
SS	substation
CCD-SMD	Central Commission for the Development of Solid Mineral Deposits of the Federal Agency for Mineral Resources (Rosnedra)
CHPP	combined heat and power plant
CPS	central production site
EDS	exploration and development shaft
FS	feasibility study
IP	intellectual property
ISL	in-situ leaching
PSEDA	priority social and economic development area
SCMR, FSFI	State Commission on Mineral Reserves, Federal State-Funded Institution
SOCEX	social expenses

GRI 102–53
GRI 102–3

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