THE ROLE OF ROSATOM

IN PROMOTING THE RUSSIAN AGENDA IN THE WORLD

GLOSSARY OF TERMS AND ABBREVIATIONS

BRICS - Association of countries: Brazil, Russia, India, China, South Africa

Chernobyl NPP - Chernobyl Nuclear Power Plant located in Pripyat, Kyiv Oblast, Ukraine

EU - European Union

FSUE - Federal State Unitary Enterprise

IAEA - International Atomic Energy Agency

Isotope - variety of a chemical element's atom, distinguished from other isotopes of the same element by the number of neutrons in the nucleus

JSC - Joint Stock Company

JV - Joint Venture

LLC - Limited Liability Company

Media - Mass media

MW - Megawatt, a unit of power

NNEGC - National Nuclear Energy Generating Company

NPP - Nuclear Power Plant

NSDC - National Security and Defense Council of Ukraine

Nuclear Reactor - A device designed to facilitate a fission reaction, always accompanied by energy release.

PJSC - Public Joint Stock Company

Power Block - A part of a thermal or nuclear power plant that is a technological complex for electricity generation

RF - Russian Federation

RSA - Republic of South Africa

SE - State-Owned Enterprise

TVEL - The main element of a nuclear reactor containing nuclear fuel

UAE - United Arab Emirates

USA - United States of America

USSR - Union of Soviet Socialist Republics

VVER - Pressurized Water Reactor that uses water as a coolant and moderator

Zaporizhzhia NPP - Zaporizhzhia Nuclear Power Plant located in Enerhodar, Zaporizhzhia Oblast, Ukraine

Introduction

During the International Nuclear Policy Conference in October 2022, the Director General of the International Atomic Energy Agency (IAEA), Rafael Grossi, highlighted that Russia is one of the largest suppliers of commercial nuclear technologies worldwide[1]. This indicates that Russia wields significant influence in the global nuclear energy market. Serving as an instrument/operator of this influence for the Russian state is the corporation Rosatom, which is the authorized body for managing nuclear energy use in Russia. Furthermore, Rosatom is vested with the authority to engage in state management activities related to the development, manufacturing, disposal of nuclear weapons, and military nuclear facilities, as well as regulatory control in the field of nuclear energy use[2].

According to the statement of Rosatom's CEO, the company's revenue for 2022 exceeded 1.7 trillion rubles[3], equivalent to about 20 billion dollars. Rosatom enables Russia to generate income not only from domestic entities but also from companies and governments worldwide. For instance, the corporation's website indicates that its foreign orders exceeded 139.9 billion dollars in 2021[4].

The Russian government views Rosatom not only as a company providing financial benefits but also as an instrument of political influence. Utilizing Rosatom, Russia becomes involved in executing certain political plans that may have destabilizing or even criminal implications. Examples in the Ukrainian context include the occupation of Crimea in 2014 and the large-scale invasion of Ukraine in 2022. For instance, Rosatom's subsidiary, JSC Dedal, was involved in constructing a wall along the border between occupied Crimea and the rest of Ukraine[5]. This activity serves as an example of Rosatom fulfilling political functions by assisting the Russian government in an unlawful border arrangement.

Moreover, during the extensive invasion of Ukraine, Russia gained control over two Ukrainian nuclear power plants: the Chernobyl NPP, which experienced a disaster in 1986, and the Zaporizhzhia NPP. While the former was liberated during a counteroffensive by the Ukrainian Armed Forces, Russia still retains control over the Zaporizhzhia NPP. On October 5, 2022, the President of Russia issued a decree to transfer the Zaporizhzhia NPP's assets and other necessary properties to federal ownership for the

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[1] A Keynote Conversation with IAEA Director General Rafael Gross on 2022 Carnegie International Nuclear Policy Conference.https://ceipfiles.s3.amazonaws.com/pdf/NPC22/A+Keynote+Conversation+with+IAEA+Director+General+Rafael+Grossi.pdf

[2] Federal Law "On the State Atomic Energy Corporation 'Rosatom'" dated December 1, 2007, No. 317-FZ. https://base.garant.ru/12157441/

[3] Interfax. Revenue of Rosatom in 2022 amounted to over 1.7 trillion rubles (as of January 31, 2023). https://www.interfax.ru/amp/883941

[4] Rosatom State Atomic Energy Corporation. Projects. https://www.rosatom.ru/en/investors/projects/

[5] Dedal. Rosatom. Presa pro nas. New automated complexes guard the border of Crimea with Ukraine (January 11, 2022). https://dedal.ru/info/pressa-o-nas/granitsu-kryma-s-ukrainoy-okhranyayut-novye-avtomaticheskie-kompleksy.html?sphrase_id=11228

implementation of its activities[6]. According to information from Ukrainian and Russian media[7], as well as statements from the head of NNEGC Energoatom (hereinafter Energoatom), Petr Kotin[8], employees of the Zaporizhzhia NPP entered into labor contracts with the State Atomic Energy Corporation Rosatom (hereinafter Rosatom).

In this manner, Russia, with the assistance of Rosatom, essentially commits an act of nuclear terrorism and another war crime.

Russian military presence at the Zaporizhzhia NPP[9]

The company provides Russia with the opportunity to militarize nuclear energy and have influence over governments and populations of countries where it has its nuclear facilities or to which Rosatom sells fuel, services reactors, exports nuclear waste, modernizes or builds new NPPs, and so on.

Structure and activities of Rosatom

Rosatom is one of the leading companies in the global nuclear energy market. Its legislative activities are regulated by the Federal Law "On the State Atomic Energy Corporation Rosatom" of December 1, 2007, No. 317-FZ[10] (hereinafter referred to as the Law). According to Article 21, Part 1 of the Law, Rosatom is

[6] Decree of the President of Russia "On the peculiarities of legal regulation in the field of atomic energy use in the territory of Zaporizhzhia Oblast" (October 5, 2022). http://kremlin.ru/acts/news/69522

[7] Vedomosti. Kiriyenko visited Zaporizhzhia Nuclear Power Plant (December 28, 2022). vedomosti.ru/politics/news/2022/12/28/957418-kirienko-proveril-bezopasnost-zaporozhskoi-aes

[8] NV. Not allowed to pass at checkpoints. Head of Energoatom talks about the situation of the Zaporizhzhia Nuclear Power Plant employees (June 14, 2022). https://nv.ua/ukr/ukraine/events/viyna-v-ukrajini-shcho-vidbuvayetsya-z-pracivnikami-zaporizkoji-aes-novini-ukrajini-50331939.html

[9] BBC News Ukraine. The situation at the Zaporizhzhia Nuclear Power Plant has gone out of control. What are the implications of this? (August 5, 2022). https://www.bbc.com/ukrainian/features-62433000

[10] Federal Law "On the State Atomic Energy Corporation 'Rosatom'" dated December 1, 2007, No. 317-FZ. https://base.garant.ru/12157441/

managed by the Supervisory Board, the Director-General, and the Executive Board. Currently, the Supervisory Board consists of 9 members, 8 of whom represent the President and the government of Russia, while the Director-General is an ex officio member of the board. Since 2016, Oleksii Likhachov has been the general director of Rosatom. His predecessor from 2007 to 2016 was Serhii Kyriyenko, who unofficially was referred to in Russian media as a "curator" of certain areas in Donetsk and Luhansk Oblasts, which have been outside the control of the Ukrainian government since 2014[11]. Kyriyenko officially holds the position of First Deputy Chief of Staff of the Russian Presidential Administration, but he maintains his influence over Rosatom. For instance, by a presidential decree dated January 23, 2017, he was appointed Chairman of the Supervisory Board[12], which is the highest governing body of Rosatom. It is also known from open sources that he visited the Zaporizhzhia Nuclear Power Plant in December 2022, where he inspected the working conditions of the station's employees who, as mentioned earlier, had employment contracts with Rosatom[13]. Based on the above, it can be concluded that Serhii Kyriyenko remains the main curator of Rosatom. At the same time, the activities of Rosatom within the Russian government are coordinated by Deputy Prime Minister Oleksandr Novak, the former head of the Ministry of Energy of the Russian Federation[14] (as of the preparation of this report).

In the sphere of its management, Rosatom encompasses hundreds of enterprises and organizations[15]. Additionally, Rosatom has branches, offices, and representations in other countries. The aforementioned law states that the activities of Rosatom are aimed at creating unity in the management of organizations in the nuclear energy industry and Russia's nuclear weapons complex, as well as organizations involved in nuclear and radiation safety, nuclear science, technology, and workforce training. Furthermore, Rosatom ensures the implementation of state policies in the development of the nuclear industry and the execution of tasks related to the state program of armaments and state defense orders.

Another important aspect worth noting is Rosatom's cooperation with the Ministry of Defense of Russia, wherein it provides support and development of the armed forces' ammunition reserves in terms of both quality and quantity, ensuring the implementation of Russia's nuclear deterrence policy. Additionally, together with the Ministry of Defense, Rosatom prepares nuclear weapons for testing[16].

[11] RTVI. Media: Deputy Head of the Presidential Administration Kiriyenko visited Donbas (April 23, 2022). https://rtvi.com/news/smi-glava-administratsii-prezidenta-kirienko-posetil-donbass/

[12] Decree of the President of the Russian Federation dated January 23, 2017, No. 28 "On the members of the supervisory board of the State Atomic Energy Corporation 'Rosatom'." http://www.kremlin.ru/acts/bank/41658

[13] Vedomosti. Kiriyenko visited Zaporizhzhia Nuclear Power Plant (December 28, 2022). https://www.vedomosti.ru/politics/news/2022/12/28/957418-kirienko-proveril-bezopasnost-zaporozhskoi-aes

[14] The Russian Government. Distribution of responsibilities among Deputy Heads of the Government. http://government.ru/gov/responsibilities/

[15] Rosatom. Rosatom will develop pilotage services in seaports (March 30, 2022).https://rosatom.ru/journalist/news/rosatom-budet-razvivat-lotsmanskie-uslugi-v-morskikh-portakh/

[16] The Russian Government. State Atomic Energy Corporation Rosatom. http://government.ru/department/362/about/

Rosatom's international activities involve interacting with the governmental bodies of foreign countries and international organizations, as well as entering into international agreements on matters within Rosatom's competence. This international activity is also carried out through the offices and representations of Rosatom in other countries.

Furthermore, paragraph 4 of Article 14 of the Law is worth highlighting, which states that Rosatom directs its representatives to work in foreign countries within the diplomatic missions, consular offices, and trade missions of Russia, without including these employees in the staff of the named institutions and representations. The norms of this law are specified by the Decree of the President of the Russian Federation dated May 6, 2011, No. 603, according to which the Director-General of Rosatom makes decisions regarding the appointment of its representatives with the approval of the Ministry of Industry and Trade of the Russian Federation (for work in trade missions of Russia) and the Ministry of Foreign Affairs of the Russian Federation (for work in trade missions, diplomatic missions, and consular offices of Russia)[17]. Thus, Rosatom's employees effectively receive diplomatic cover. Moreover, based on the analyzed documents (agreements, memorandums) of cooperation between Russia (Rosatom) and other countries (governments, companies) as reported by experts, the typical forms of interaction between the parties include the exchange of experts and the creation of joint working groups[18]. This creates the possibility of involving Rosatom employees in Russia's covert activities in other countries.

Below is a list of the main areas of activity of Rosatom[19] [20] and examples of companies that implement them[21]:

- Uranium ore mining (*JSC Atomredmetzoloto Uranium One, JSC Dalur*);
- Uranium conversion and enrichment (*JSC Angarsk Electrolysis Chemical Plant, JSC Siberian Chemical Plant, JSC Ural Electrochemical Plant)*;
- Production and supply of fuel for nuclear power plants (*JSC Machine-Building Plant, JSC TVEL*);
- Construction of nuclear power plants, including on a credit basis (*JSC Atomstroyexport, JSC Atomenergoprom, JSC Akkuyu Nuklear, JSC Rusatom Overseas*);
- Construction of small-capacity nuclear power plants *(JSC Rusatom Overseas*);

[17] Decree of the President of the Russian Federation dated May 6, 2011, No. 603 "On the appointment of representatives of the State Atomic Energy Corporation Rosatom to work in foreign countries." http://www.kremlin.ru/acts/bank/33121

[18] Order of the Government of the Russian Federation dated February 7, 2023, No. 265-r "On the signing of an agreement between the government of the Russian Federation and the government of the Republic of Nicaragua on cooperation in the field of non-energy use of atomic energy for peaceful purposes." https://rulaws.ru/goverment/Rasporyazhenie-Pravitelstva-RF-ot-07.02.2023-N-265-r/

[19] Federal Law "On the State Atomic Energy Corporation 'Rosatom'" dated December 1, 2007, No. 317-FZ. https://base.garant.ru/12157441/

[20] International Atomic Energy Agency (IAEA). Country Nuclear Power Profiles. Russian Federation. https://cnpp.iaea.org/countryprofiles/Russia/Russia.htm

[21] In brackets are examples of companies and enterprises of the Rosatom Corporation that implement specific areas of activity, if possible to identify. The list of companies is not exhaustive, and the information is taken from: https://rosatom.ru/about/factories/

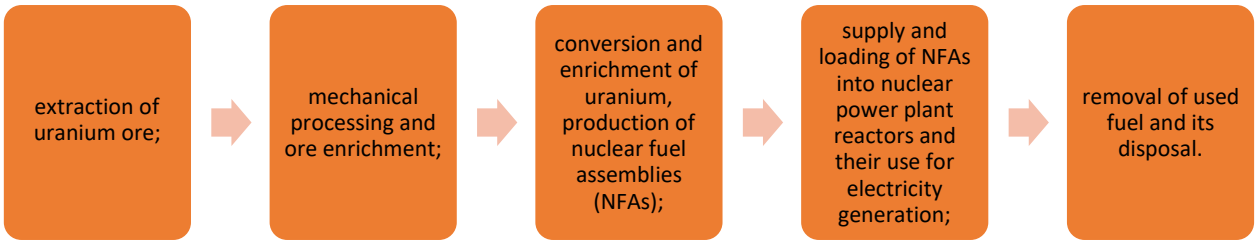
- Storage and reprocessing of used nuclear fuel (*Federal State Unitary Enterprise Mining and Chemical Combine*).
- Scientific research in the field of nuclear energy (*JSC Research Institute of Atomic Reactors, JSC Bochvar High-Technology Research Institute of Inorganic Materials, JSC Leading Research Institute of Chemical Technology*);
- Production of equipment for nuclear power plants (*JSC Hydropress, PJSC Machine-Building Plant ZiO-Podolsk*);
- Technical servicing and repair of nuclear power plant equipment (*JSC Atomenergoremont*);
- Training of nuclear power plant personnel [22](*JSC Atomtechenergo, JSC Engineering and Technical Center Jet*);
- Production of isotopes and other activities in the field of nuclear medicine (*JSC Isotope, JSC Rusatom Healthcare*);
- Generation of non-nuclear electric energy: hydroelectric power plants, wind power plants (*JSC VetroOGK, JSC Novawind*);
- Supply of electricity *(JSC AtomenergoSbut*);
- Shipbuilding (*JSC Atomenergomash, JSC Baltic Shipyard*);
- Atomic icebreaker fleet[23] (*Federal State Unitary Enterprise Atomflot*);
- Environmental protection.
- Development and production of information security tools.
- Development, production, and operation of secure information and telecommunications systems using cryptographic means.
- Activities related to the use and protection of classified information.
- Design, creation, and operation of communication channels, including satellite communication, provision of communication services, including data transmission and telematic communication services, telephone services, rental of communication channels.
- Activities related to the distribution and maintenance of encryption (cryptographic) tools.
- Provision of information encryption services.
- Production of components for nuclear weapons (*Federal State Unitary Enterprise VO Mayak*);
- Development, testing, and disposal of nuclear warheads and nuclear charges; creation and support of military nuclear facilities, weapon samples, military and special equipment using nuclear weapons technology;
- Development and production of devices and systems for object protection (*JSC Dedal*) etc.

[22] Rosatom. Nuclear Services and Maintenance. https://rosatom.ru/en/rosatom-group/nuclear-services-and-maintenance/
[23] Federal State Unitary Enterprise "Atomflot".http://rosatomflot.ru/

Russian nuclear icebreaker fleet[24]

On the official Rosatom website, it is stated that they have competencies across the entire technological chain of the nuclear fuel cycle, from natural uranium mining to the final stage of the life cycle of nuclear facilities[25]. Other sources also indicate that a benefit of international cooperation with Rosatom is that the company serves as a single "point of contact and provides a comprehensive offer to countries interested in developing nuclear energy,"[26] meaning that by collaborating with Rosatom, a "client" can obtain all goods, services, and work for the construction and operation of nuclear power plants from a single supplier.

In general, the open nuclear fuel cycle includes the following stages:



Background: *TVEL (heat-releasing element) is the main element of a nuclear reactor containing nuclear fuel. The used fuel obtained at the final stage contains 96% uranium, 1% plutonium, and 3% other high-level waste. Similar to freshly mined uranium, the uranium obtained through reprocessing can be converted and re-enriched. Plutonium can be mixed with uranium and used to produce mixed oxide fuel for nuclear reactors.*[27] *In recent decades, Rosatom has been involved in scientific research to expand the use of plutonium in the field of nuclear energy. Used fuel can*

[24] Rosatom. Areas of activity. Development of the Northern Sea Route. https://rosatom.ru/production/fleet/
[25] Rosatom. Global presence. https://rosatom-centraleurope.com/global-presence/
[26] Enerdata. Civil nuclear strategies. A comparison of the nuclear sectors in the USA, Russia and China (11 of March 2021). https://www.enerdata.net/publications/executive-briefing/world-civil-nuclear-strategies.html
[27] International Atomic Energy Agency. Getting to the Core of the Nuclear Fuel Cycle. From the mining of uranium to the disposal of nuclear waste. https://www.iaea.org/sites/default/files/18/10/nuclearfuelcycle.pdf

either be buried or reused. In the first case, this nuclear fuel cycle is called an open cycle, and in the second case, it's called a closed cycle.

Uranium Ore Mining

Considering the first stage of the nuclear fuel cycle, it is worth noting that Russia is not a leader in terms of uranium ore availability.

According to the latest information from the World Nuclear Association as of 2021, Russia ranked 6th in the global uranium production ranking. It is likely that this trend in the distribution of countries by uranium ore mining has remained unchanged up to the present day. Kazakhstan retained the top position with 45% of the world's production in 2021, as it did in previous years. However, among the top 10 companies engaged in uranium ore mining, there are two Russian companies that belong to Rosatom: "Uranium One," with assets in Kazakhstan, Tanzania, and Namibia (ranked 3rd among companies with 9% of the world's production in 2021), and "ARMZ" (JSC Atomredmetzoloto), with assets in Zabaykalsky Krai, Buryatia, and Kurgan Oblast of Russia (ranked 8th with 5% of the world's production, respectively)[28].

Uranium Ore Mining at one of Rosatom's facilities[29]

[28] World Nuclear Association. World Uranium Mining Production. https://world-nuclear.org/information-library/nuclear-fuel-cycle/mining-of-uranium/world-uranium-mining-production.aspx

[29] Rosatom. Areas of activity. Uranium mining. https://rosatom.ru/production/mining/

Conversion and Uranium Enrichment

Equally important stages of the nuclear fuel cycle are conversion and uranium enrichment. According to reports from international and expert organizations, there has been an excess of capacity[30] in the field of conversion and uranium enrichment worldwide in recent years[31].

As of 2020, commercial conversion plants were operational in only four countries: Russia (Rosatom), Canada (Cameco), China (CNNC), and France (Orano). Another plant in the USA (ConverDyn) is closed, but it is expected to be restarted in 2023. [32]

In the field of uranium enrichment, Rosatom is also among the top four largest companies in the world. According to the latest available data, as of 2020, Rosatom possessed 38% of the world's capacity in conversion[33] and 46% in uranium enrichment[34]. In Russia, uranium enrichment is carried out by Rosatom's subsidiary, JSC Techsnabexport (TENEX), with plants in Novouralsk, Zelenogorsk, Seversk, and Angarsk.

Production and Supply of Fuel Assemblies (TVELs)

Rosatom is a manufacturer and supplier of fuel assemblies (TVELs) for nuclear power plants (NPPs). Competition in this matter may come from other fuel supply companies, with the most powerful among them being the American company Westinghouse and the French company Areva. However, there are cases where Rosatom acts as a monopolist. This is particularly true for NPPs equipped with VVER-440 type nuclear reactors, which were built during the Soviet era.

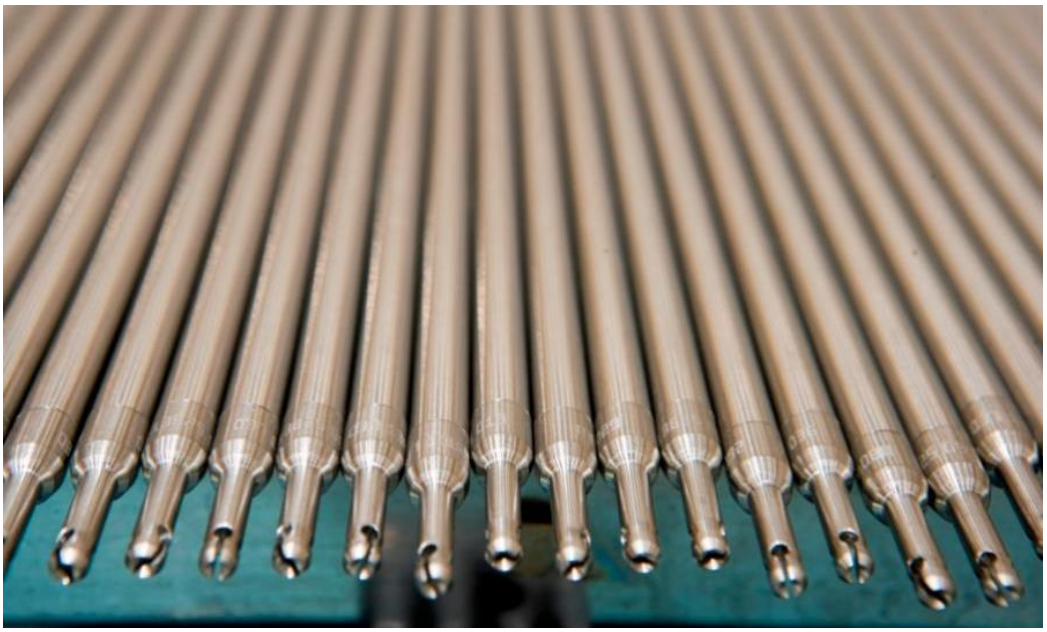
[30] World Nuclear Association. Uranium Enrichment. https://world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/uranium-enrichment.aspx

[31] Enerdata. Civil Nuclear Strategies. A comparison of the nuclear sectors in the USA, Russia and China. https://www.enerdata.net/publications/executive-briefing/world-civil-nuclear-strategies.html

[32] World Nuclear Association. Uranium Enrichment. https://world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/uranium-enrichment.aspx).

[33]World Nuclear Association. Conversion and Deconversion. https://world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/conversion-and-deconversion.aspx

[34] World Nuclear Association. Uranium Enrichment. https://world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/uranium-enrichment.aspx



Fuel Assemblies (TVELs) produced by Rosatom's subsidiary JSC TVEL[35]

Background: *VVER (Pressurized Water Reactor) is a type of nuclear reactor that uses water as a coolant and moderator. Invented in the USSR, they continue to be manufactured by Russia. Depending on their capacity (MW), they can be of different types, such as VVER-440, VVER-1000, and VVER-1200.*

Rosatom is the only company in the world that supplies TVELs for VVER-440 type reactors. They are located in:

- • Finland (Loviisa NPP - 2 reactors),
- • Czech Republic (Dukovany NPP - 4 reactors),
- • Slovakia (Mochovce NPP - 3 operational reactors and 1 under construction, and Bohunice NPP - 2 reactors),
- • Hungary (Paksh NPP - 4 reactors),
- • Ukraine (Rivne NPP - 2 reactors),
- • Armenia (Armenian NPP - 1 reactor).

This monopoly is due to the fact that since the launch of these reactors, the only supplier of TVELs was initially the USSR and later Russia, specifically Rosatom's subsidiary, which utilized the capacities inherited from the Soviet era. Therefore, there was no need for other companies to develop a similar fuel, as Rosatom fully occupied this niche in the market. Moreover, such reactors are considered outdated worldwide, and their service life is expected to be limited to several decades, leading to a reduced demand for this type of fuel.

In addition, JSC TVEL supplies fuel for NPPs with other types of reactors (e.g., in Bulgaria). For these types of reactors, other suppliers may also provide services. For instance, the South Ukraine NPP, equipped with

[35] Fuel company of Rosatom, TVEL. Photobank. https://www.tvel.ru/press-center/photogallery/

VVER-1000 reactors, was previously serviced by Rosatom, but due to the Russian aggression that began in 2014, the fuel supplier was changed to the American company Westinghouse[36].

Construction of an NPP of Russian design.

One of the significant activities of the company is the construction of NPPs, including small-scale NPPs, of the so-called Russian design. For this purpose, Rosatom enters into contracts in the format of EPC (Engineering, Procurement, and Construction), where the client hires a contractor to carry out the full cycle of works.

In addition to Rosatom's subsidiary companies, such as JSC ATOMPROEKT and JSC Atomstroyexport, being contractors for such construction projects, there are cases where Rosatom directly owns the NPPs. For instance, the builder and owner of the Akkuyu NPP in Turkey under the build-own-operate (BOO) terms is the company Akkuyu Nuklear, registered in Turkey[37] and owned by Rosatom.

Ceremony of the beginning of construction of the energy unit of the Akkuyu NPP.[38]

A similar situation could have occurred with the Hanhikivi NPP in Finland if the company that Rosatom owns had completed its construction. The RAOS Project, a subsidiary of Rosatom registered in Finland, was supposed to realize the construction, and RAOS Voima Oy, another Rosatom subsidiary, was to hold a controlling share package. However, due to Russia's full-scale invasion of Ukraine, the Finnish side

[36] *International Atomic Energy Agency*. Performance of the Westinghouse WWER-1000 fuel de. signhttps://inis.iaea.org/collection/NCLCollectionStore/_Public/43/056/43056279.pdf
[37]Rosatom. Akkuyu Nuclear Power Plant. http://www.akkuyu.com/
[38] Rosatom. Photo gallery. https://www.rosatom.ru/journalist/media/photo/?S_ID=1144#

suspended the construction of the Hanhikivi NPP at the beginning and completely terminated the contract in May 2022. In contrast, construction of the NPP in Turkey continues.

Most of the projects for the construction and modernization of NPPs are based on Russia's credit funds, which are provided at low interest rates and for extended periods. During the Carnegie International Nuclear Policy Conference 2022, Rafael Grossi, the Director-General of the IAEA, pointed out that Russia is more successful than the United States in supplying nuclear technologies because it uses "*a different financing model that allows for more flexibility, including in international markets*."[39] This likely includes providing credit facilities for NPP construction, which is an advantage for Rosatom. **This further confirms Rosatom's status as a significant operator of influence, and its activities can be considered an element of the economic power of the state**.

Overall, Russia's policy of providing credits is present in many spheres and is one of the methods through which the Russian Federation exercises its influence in other countries. The general objectives of Russia in implementing this method are outlined in the Resolution of the Government of the Russian Federation dated September 16, 2020, No. 1456-50 "On Approval of the Rules for Providing State Credits by the Russian Federation to foreign borrowing states": [40]

- Support of the export of domestic goods (works, services) with a high share of value-added;
- Consolidation of the presence of Russian economic entities in promising foreign markets;
- Facilitation of the development and deepening of political, economic, and other forms of cooperation between the Russian Federation and foreign borrower countries;
- Formation of a positive image of the Russian Federation as a responsible international creditor and donor;
- Development of mutually beneficial and equal partnership relations with foreign countries on a non-discriminatory basis.

Accordingly, the table below provides information on the financing of nuclear power plant construction, collected from open sources.

[39]A Keynote Conversation with IAEA Director General Rafael Gross on 2022 Carnegie International Nuclear Policy Conference.https://ceipfiles.s3.amazonaws.com/pdf/NPC22/A+Keynote+Conversation+with+IAEA+Director+General+Rafael+Grossi.pdf

[40] Official internet portal of legal information. Decree of the Government of the Russian Federation dated September 16, 2020, No. 1456-50 "On the Approval of the Rules for Providing State Credits by the Russian Federation to Foreign Borrowering States." http://actual.pravo.gov.ru/text.html#pnum=0001202009230033

Name of the NPP	What they do	Estimated construction cost	Loan amount	Term and interest
Bangladesh, Ruppur NPP[41]	Construction of an NPP with 2 VVER-1200 reactors.	$12.5 billion	$11.4 billion	28 years, information regarding percentages is absent.
Belarus, Belarusian NPP[42]	Construction of an NPP with 2 VVER-1200 reactors.	$11 billion	$10 billion	25 years, annual interest rate 3.3%.
Armenia, Armenian NPP[43]	Modernization of the 2nd VVER-440 reactor.	No information available	$270 million loan and $30 million grant.	Information regarding the terms and percentages is absent.
Egypt, El Dabaa NPP [44]	Construction of an NPP with 4 VVER-1200 reactors.	$30 billion	$25 billion	35 years, annual interest rate 3%
India, Kudankulam NPP [45]	Construction of units 3, 4, 5, 6 with VVER-1000 reactors.	$6.4 billion	$4.2 billion	10 years, information regarding percentages is absent.
Iran, Bushehr NPP	Construction of the 2nd VVER-1000 unit	$10 billion[46]	Full information is not available, the minimum amount is €500 million.[47]	Information regarding the terms and percentages is absent.
Hungary, Paks NPP	Construction of units 5 and 6 with VVER-1200 reactors.	€12.5 billion[48]	€10 billion	Information regarding the terms and percentages is absent.

[41] Public organization Social and Ecological Union. https://rusecounion.ru/sites/default/files/rseunuclearstatusreport2021.pdf.pdf

[42] Version. Debt reactors. Rosatom is allocating Russian billions for the benefit of other countries (July 5, 2021). https://versia.ru/rosatom-osvaivaet-rossijskie-milliardy-na-blago-drugix-stran

[43] Public organization Social and Ecological Union. Status of the nuclear industry in Russia in 2021. https://rusecounion.ru/sites/default/files/rseunuclearstatusreport2021.pdf_0.pdf

[44] Ibid.

[45] Ibid.

[46] Ibid.

[47] TASS. Iran owes Russia €500 million for the construction of the Bushehr Nuclear Power Plant (June 26, 2021). https://tass.ru/ekonomika/11762063

[48] Public organization Social and Ecological Union. Status of the nuclear industry in Russia in 2021. https://rusecounion.ru/sites/default/files/rseunuclearstatusreport2021.pdf_0.pdf

Analysis of Rosatom's activities in other countries

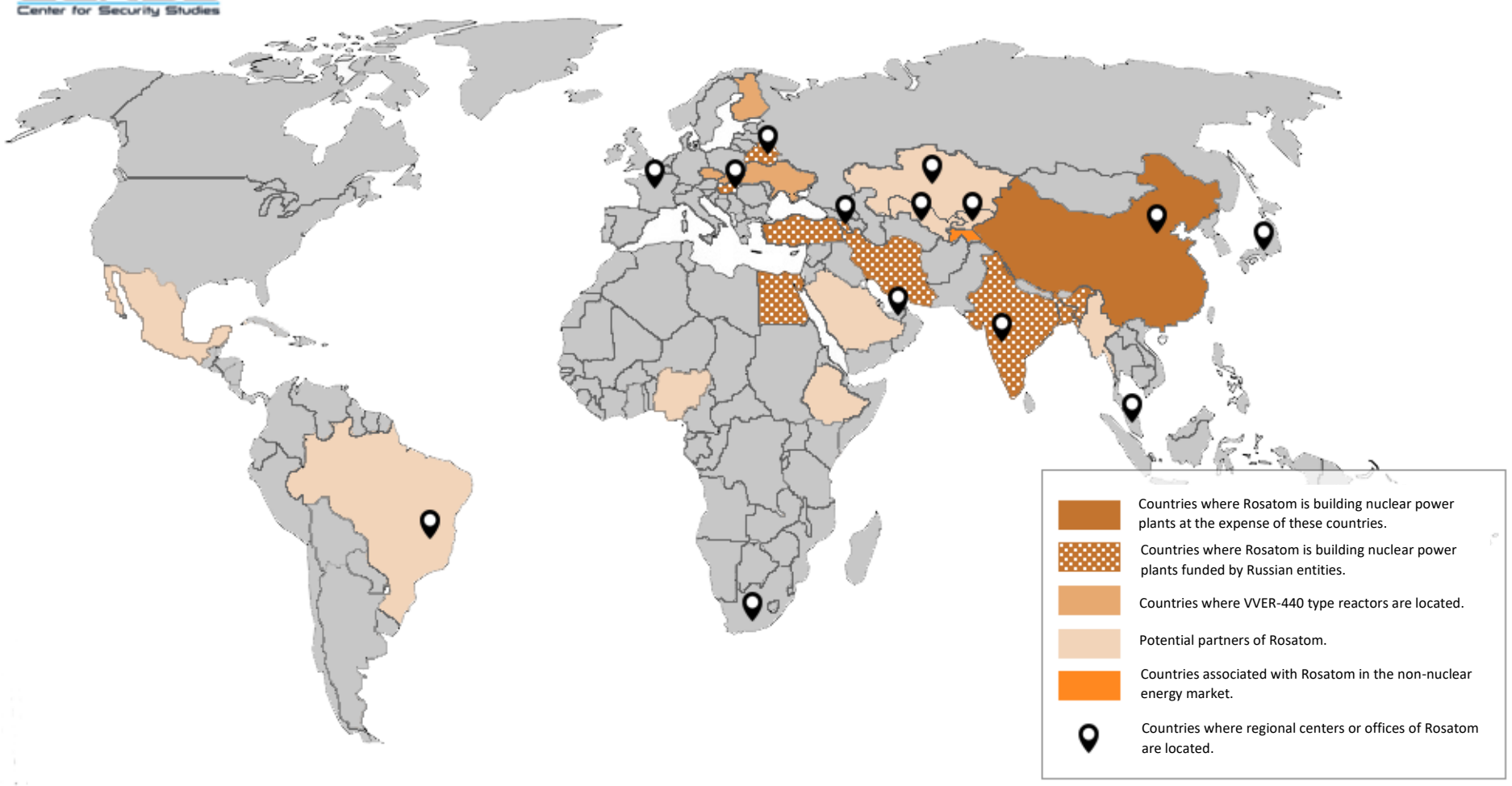
In this section of the report, we have gathered and analyzed information from open sources regarding Rosatom's activities outside the Russian Federation, with a particular focus on activities within the nuclear fuel cycle and the presence of Rosatom's representations (centers, offices) in other countries.

Specifically, on the map below, prepared by experts from CENSS, the following Rosatom activities in other countries are depicted:

- Construction of nuclear power plants at the expense of countries or companies;
- Construction of nuclear power plants financed by Russian entities;
- Servicing of VVER-440 reactors (monopoly servicing);
- Activities in the non-nuclear energy market;
- Location of regional representations;
- Achieved agreements on potential partnerships.

Detailed information on different countries will be provided further.

CENSS
Center for Security Studies



In Hungary, there are already VVER-440 type reactors, and the construction of a nuclear power plant is underway on loan. A similar situation exists in Armenia, where there is a reactor of Soviet design that has been additionally modernized with credit. Information about Rosatom's cooperation with Bolivia, Nicaragua, Cuba, Argentina, Tanzania, Uganda, Kenya, Zambia, Ghana, and others is also mentioned in open sources and statements by official representatives. However, the focus of these collaborations is largely related to non-energy nuclear applications, so they are not marked on the map.

Main aspects of Rosatom's activities in EU countries

EU member countries cooperate with Rosatom in various forms, including importing raw materials (uranium), nuclear fuel assemblies (TVELs), procuring services for the construction, operation, equipment, decommissioning, and modernization of nuclear power plants. [49] It is in EU countries that the largest number of Soviet-designed nuclear reactors are located.

Within the framework of cooperation between Rosatom and Framatome (France), three reactors in Western Europe are supplied with fuel produced by Rosatom. Connections between Rosatom and companies such as Framatome, Siemens, GE Steam Power, and Alstom can be traced in the field of new projects for the construction of Russian nuclear power plants in other countries, including those outside the EU, such as Hanhikivi in Finland (canceled), Akkuyu in Turkey, El-Dabaa in Egypt, and Leningrad II in Russia.[50]

Additionally, Rosatom has several official representations in EU countries.

Bulgaria

The Kozloduy Nuclear Power Plant is located in Bulgaria, which is the country's only nuclear power plant and produces the cheapest electricity. The NPP is owned by the Bulgarian Energy Holding (state-owned). The NPP has two VVER-1000 type reactor units. In 2021, the share of electricity generated by the Kozloduy NPP in the country was 34.6%.[51] As part of fuel diversification at the NPP, contracts were signed in December 2022 for the supply of fuel for unit 5 with Westinghouse[52] and for unit 6 with Framatome[53]. However, as of now, the supply of fuel and necessary materials for the NPP is carried out by Rosatom's subsidiary, JSC TVEL[54]. In particular, on March 22, 2023, a meeting of the Bulgarian government was held,

[49] European Commission. Analysis of ROSATOM activities and/or ROSATOM ties with the EU. https://data.europa.eu/data/datasets/analysederrosatomaktivittenbzwrosatomverflechtungenmitdereu?locale=en

[50] European Commission. Analysis of ROSATOM activities and/or ROSATOM ties with the EU. https://data.europa.eu/data/datasets/analysederrosatomaktivittenbzwrosatomverflechtungenmitdereu?locale=en

[51] Kozloduy Nuclear Power Plant (Bulgaria). Report for 2021. https://www.kznpp.org/upload/31648/Doklad_za_napredaka_2021-EN.pdf

[52] Kozloduy Nuclear Power Plant (Bulgaria). News. Minister Hristov: we have entered a new era in Bulgaria's nuclear energy (December 22, 2022). https://www.kznpp.org/bg/novini/559-MINISTAR-HRISTOV%3A-STARTIRAHME-NOVATA-EPOHA-V-BALGARSKATA-ATOMNA-ENERGETIKA

[53] Kozloduy Nuclear Power Plant (Bulgaria). News. Minister Hristov: the process of diversification of supplies for the Bulgarian NPP is completed with the signing of an agreement with Framatome (December 30, 2022). https://www.kznpp.org/bg/novini/560-MINISTAR-HRISTOV%3A-S-PODPISANOTO-SPORAZUMENIE-S-FRAMATOM-ZAVARShVA-PROTsESAT-PO-D

[54] Neftegaz.ru. Bulgaria allowed the Kozloduy NPP to purchase necessary equipment in Russia (March 23, 2023).https://neftegaz.ru/news/nuclear/774101-bolgariya-razreshila-aes-kozloduy-zakupku-neobkhodimogo-oborudovaniya-v-rossii/

during which a decision was made to allow the purchase of fuel and necessary materials for the Kozloduy NPP, equipped with VVER-1000 reactors[55][56].

Slovakia

In Slovakia, the Mochovce and Bohunice Nuclear Power Plants are located, which together provide 82.3% of the country's electricity production (as of 2021).[57] Their owner is Slovenské elektrárne (Slovak Power Plants), and the state owns 34% of the shares.[58] Both NPPs are equipped with Soviet-designed VVER-440 reactors (a total of 5 operating reactors and 1 under construction), and they receive fuel from Rosatom.

Hungary

In Hungary, there is one nuclear power plant – the Paks Nuclear Power Plant. It is equipped with four VVER-440 type reactors, accounting for about 70% of the country's electricity production[59]. The plant is owned by the state company MVM Group.

Rosatom is also involved in building and financing the construction of the 5th and 6th reactors at the Paks Nuclear Power Plant, known as Paks 2. Along with him, the construction of the Paks NPP is carried out by KralovoPolska Ria[60], the controlling stake of which is owned by the well-known Hungarian businessman Lorinc Meszaros. According to the information from Deutsche Welle, Meszaros is associated with Hungarian Prime Minister Viktor Orban (quote from the source: "*a portion of Meszaros' company's profits ultimately end up in the pockets of Orban and his family*"[61]). However, we could not find confirmation of this information from other sources.

Moreover, in Budapest, there is the office Rosatom Central Europe[62] and the company Ganz EEG Kft, a part of Rosatom's machine-building division specializing in the production of energy machinery products for nuclear power plants and the oil industry[63].

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[55] Neftegaz.ru. Bulgaria allowed the Kozloduy NPP to purchase necessary equipment in Russia (March 23, 2023).https://neftegaz.ru/news/nuclear/774101-bolgariya-razreshila-aes-kozloduy-zakupku-neobkhodimogo-oborudovaniya-v-rossii/

[56] BNR. Radio Bulgaria. The Temporary Cabinet of Ministers approved the deviation from EU sanctions regarding the receipt of Russian nuclear materials for the Kozloduy NPP (March 22, 2023). https://bnr.bg/en/post/101797251/kozloduy-npp-to-be-supplied-with-russian-nuclear-consumables

[57] Slovenske Elektrarne. Operation & Safety Report of Mochovce and Bohunice Nuclear Power Plants 2021. https://www.seas.sk/wp-content/uploads/2022/05/npp-operation-report-2021-en.pdf

[58] Slovenske Elektrarne. Shareholders. https://www.seas.sk/en/about-us/key-information/shareholders/

[59] The national group of Hungarian electricity companies – MVM Group. MVM Group Integrated Report 2021. https://atomeromu.mvm.hu/-/media/PAZrtSite/Documents/Rolunk/Kozerdeku/Jelentesek/CSRJelentesEN/MVM_Group_Integrated_Report_2021.pdf

[60] DW. Investigation by DW: Viktor Orban's favorite businessman (October 30, 2017). https://cutt.ly/SwqytPay

[61] Deutsche Welle reports this, citing local journalists.

[62] Rosatom. International cooperation. Rusatom is an international network. https://rosatom.ru/about/international/rusatom_international_network/

[63] Ganz Holding. https://www.ganz-holding.hu/en/

Finland

In Finland, the Loviisa Nuclear Power Plant, equipped with two Soviet-designed VVER-440 reactors, provides 10% of the country's electricity[64]. The plant is owned by the SE Fortum.

In addition to fuel supply cooperation, Rosatom was involved in the construction project of the Hanhikivi Nuclear Power Plant, which was halted at the beginning of the full-scale Russian invasion of Ukraine and the contract was completely terminated in May 2022.

Construction site of the Hanhikivi NPP[65]

France

Besides having an office Rosatom Western Europe[66] in Paris, France is linked to Rosatom in other areas, particularly in the development of new technologies. On December 2, 2021, Rosatom and the French company Framatome[67] signed a long-term agreement for strategic cooperation aimed at consolidating efforts in fuel fabrication and control systems' development[68]. As a result of this cooperation, control systems for reactors built by Rosatom at the Paks Nuclear Power Plant in Hungary are supplied by

[64] Fortum. Loviisa nuclear power plant. https://www.fortum.com/energy-production/our-power-plants/loviisa-nuclear-power-plant

[65] Rosatom's FaceBook page. Photo of the construction site of the Hanhikivi-1 NPP (November 28, 2019). https://www.facebook.com/photo/?fbid=3721822074525252&set=a.235888116452016

[66] Rosatom. International cooperation. Rusatom is an international network. https://rosatom.ru/about/international/rusatom_international_network/

[67] The French company Framatome на 75,5% wned by the state – owned Électricité de France (EDF), 19,5% by Mitsubishi Heavy Industries and 5% by Assystem.

[68] Framatome. Framatome et Rosatom signent un accord de coopération à long terme (02 of December 2021). https://www.framatome.com/medias/framatome-et-rosatom-signent-un-accord-de-cooperation-a-long-terme/?lang=fr

Framatome[69]. In February 2023, Rosatom sent equipment for power supply systems of the International Thermonuclear Experimental Reactor to France[70].

Czech Republic

In the Czech Republic, the Dukovany Nuclear Power Plant is equipped with four Soviet-designed VVER-440 reactors, covering approximately 20% of the country's total electricity consumption[71].

Additionally, in the city of Opava, there is a registered Czech company called ARAKO spol. s r.o., which is part of Rosatom's machine-building division and specializes in manufacturing pipeline fittings[72].

As for the Czech Republic, it is worth considering the case of moving away from cooperation with Rosatom. One of the Czech nuclear power plants, Temelin NPP, with VVER-1000 reactors, began cooperation with Westinghouse (USA) back in 1993[73]. Despite the difficulties and lower prices offered by Rosatom for fuel supply, after the full-scale Russian war against Ukraine, the issue of continuing cooperation with Rosatom and fuel dependency on it became more acute. Especially since VVER-1000 reactors, for which fuel is produced by other companies, are installed at this plant. As a result, a contract was signed with Westinghouse and Framatome for fuel supply from 2024[74].

Main aspects of Rosatom's activities in European countries that are not members of the EU:

Rosatom provides a wide range of services in European countries that are not members of the EU. These countries have historical ties with the former USSR and remain connected or dependent on Russia. Russia continues to maintain its influence in these countries, using leverage in the energy sector, including through Rosatom.

Belarus

Since 2011, the construction of the Belarusian Nuclear Power Plant (NPP) has been underway in the Ostrovets area. Rosatom is financing and directly involved in the construction. One of the two planned reactor units is already operational and, as of 2021, provided 25% of the country's total electricity

[69] About Hungary. FM: Framatome to have larger role in Paks expansion (14 of March 2023). https://abouthungary.hu/news-in-brief/fm-framatome-to-have-larger-role-in-paks-expansion

[70] Rosatom. Rosatom sent the first batch of equipment for the ITER project to France in 2023 (February 15, 2023). https://rosatom.ru/journalist/news/rosatom-otpravil-vo-frantsiyu-pervuyu-v-2023-godu-partiyu-oborudovaniya-dlya-proekta-iter/

[71] CEZ Group. NPP Dukovany. https://www.cez.cz/en/energy-generation/nuclear-power-plants/dukovany

[72] International Recognized Manufacturer of Valves for Nuclear and Thermal Power Plants ARAKO. https://www.arako.cz/

[73] International Nuclear Information System. 10 years of experience with Westinghouse fuel at NPP Temelín Daniel Ernst & Lukáš Milisdörfer VVER 2010 Prague, November 1-3, 2010. https://inis.iaea.org/collection/NCLCollectionStore/_Public/42/016/42016135.pdf?r=1

[74] World Nuclear News. ČEZ says Westinghouse and Framatome deal boosts Czech energy security (28 of June 2022). https://www.world-nuclear-news.org/Articles/Westinghouse-and-Framatome-to-supply-fuel-to-Temel

production.[75] The construction of the second unit was in the process of reaching its design capacity[76] as of May 2023 and is now operational.

The Belarusian NPP is located 50 km from the city. Vilnius, Lithuania, has raised concerns for Lithuania since the beginning of its construction. In 2017, the Seimas of Lithuania adopted a law declaring the Belarusian NPP a threat to Lithuania's national security[77]. The then Minister of Foreign Affairs, Linas Linkevicius, saw the Belarusian NPP as "Russian money and technology, plus the desire to export energy to Western countries.[78]" Additionally, the operation of the NPP has been accompanied by periodic problems and emergency reactor shutdowns[79], which could lead to an increase in radiation levels. In May 2023, the State Nuclear Power Safety Inspectorate of Lithuania sent a letter to the Belarusian Ministry of Emergencies calling for the shutdown of Units 1 and 2 of the Belarusian NPP[80].

It is worth mentioning that there is a regional office of Rosatom in Minsk, Belarus[81].

Armenia

The Armenian Nuclear Power Plant is equipped with two Soviet-designed VVER-440 reactors, but one of them is already shut down, and there are no plans for its restart. As of 2021, the Armenian NPP accounted for 25% of the country's total electricity production[82]. Rosatom has conducted the modernization of the operational unit at the Armenian NPP to extend its service life. An agreed scheme involves work to restart the unit by the end of 2023[83]. Furthermore, the issue of Rosatom's construction of new units at the Armenian NPP is being raised, and the possibility of building a new NPP is being discussed. At the beginning of 2022, at the EXPO-2020 exhibition in Dubai, Rosatom and Armenia signed a Memorandum of Understanding for the exploration of possible cooperation in the construction of new nuclear power

[75] Belta. The first energy block of the Belarusian NPP produced 4.6 billion kWh of electricity (November 7, 2021). https://www.belta.by/economics/view/pervyj-energoblok-belaes-vyrabotal-46-mlrd-kvtch-elektroenergii-468327-2021/

[76] Atomic Energy. Unit 2 of the Belarusian NPP began reaching its design capacity (May 22, 2023). https://www.atomic-energy.ru/news/2023/05/22/135458

[77] Yevropeiska pravda. The Lithuanian Parliament recognized the new Belarusian NPP as a threat to the country's national security (June 15, 2017). https://www.eurointegration.com.ua/news/2017/06/15/7067223/

[78] Ekonomichna pravda. Lithuania opposes the construction of the NPP in Belarus (April 28, 2018). https://www.epravda.com.ua/news/2018/04/28/636465/

[79] Official Telegram channel of the Belarusian Ministry of Energy (January 16, 2021). https://t.me/Minenergo_by/173

[80] Ukrinform. Lithuania called on Belarus to stop the NPP in Ostrovets due to safety concerns (May 30, 2023). https://www.ukrinform.ua/rubric-world/3715833-litva-zaklikala-bilorus-zupiniti-aes-u-ostrivci-cerez-pitanna-bezpeki.html

[81] Rosatom. International cooperation. Rusatom is an international network. https://rosatom.ru/about/international/rusatom_international_network/

[82] Rosatom. Armenia's Nuclear Future (May 22, 2023). https://rosatomnewsletter.com/ru/2023/03/22/armenias-nuclear-future/

[83] Atomic Energy. The Government of Armenia and Rosatom discussed the extension of operation and the construction of a new block of the NPP (May 2, 2023).https://www.atomic-energy.ru/news/2023/05/05/134881

units of Russian design in the country[84]. Additionally, there is a business representation of Rosatom in Yerevan, Armenia[85].

Turkey

As of now, there are no existing nuclear power plants in Turkey, making the Akkuyu Nuclear Power Plant a new source of electrical energy in the country. The plant is being constructed by Akkuyu Nuklear, a company registered in Turkey and owned by Rosatom. Since the construction is carried out under a build-own-operate scheme[86], Russia effectively becomes the owner of the nuclear power plant.

Ukraine

Currently, Ukraine has four operating nuclear power plants: Khmelnytsky, Rivne, South Ukraine, and Zaporizhzhia Nuclear Power Plants (the latter is in "cold shutdown" mode)[87]. The total number of reactor units is 15, with 13 equipped with VVER-1000 reactors and 2 with VVER-440 reactors.

As mentioned at the beginning of the report, during the full-scale invasion, Russian forces gained control over the Chernobyl Nuclear Power Plant and the Zaporizhzhia Nuclear Power Plant. Presently, the Chernobyl Nuclear Power Plant is under Ukrainian control, while the Zaporizhzhia Nuclear Power Plant is still controlled by Russia.

Reactor units of the Soviet-designed VVER-440 type are located at the Rivne Nuclear Power Plant, which accounts for 12% of Ukraine's total electricity production[88]. As previously noted, there is currently no alternative source of fuel for these reactor types. Ukraine continues to use previously obtained fuel, but its reserves are depleting, and information on new deliveries from Russia is not publicly available (the relevant information was not provided by the authorized bodies upon request from CENSS).

Regarding other reactors, Ukraine previously had an alternative to Russian fuel. According to statements by the Russian side, four out of six nuclear reactors at the Zaporizhzhia Nuclear Power Plant were loaded with nuclear fuel from the American company Westinghouse[89]. Following the full-scale invasion, Ukraine signed an agreement with Westinghouse for the supply of fuel **to all Ukrainian** nuclear power plants to

[84] Rosatom. Armenia's Nuclear Future (May 22, 2023). https://rosatomnewsletter.com/ru/2023/03/22/armenias-nuclear-future/
[85] Rosatom. International cooperation. Rusatom is an international network. https://rosatom.ru/about/international/rusatom_international_network/
[86] Akkuyu Nuclear. Project history. http://www.akkuyu.com/istoriya-proekta
[87] Uatom. Website on nuclear safety, radiation protection, and non-proliferation of nuclear weapons. Operating NPPs in Ukraine. https://www.uatom.org/zagalni-vidomosti
[88] Focus. The Rivne NPP unit was shut down due to a severe thunderstorm in Western Ukraine (June 26, 2021).https://focus.ua/uk/ukraine/486481-energoblok-rovenskoy-aes-otklyuchilsya-iz-za-silnoy-grozy-nakryvshey-zapadnuyu-ukrainu
[89] TASS. Rosenergoatom stated that the Zaporizhzhia NPP does not need American technologies (April 19, 2023). https://tass.ru/ekonomika/17560391

"end the country's dependence on supplies from Russia."[90] The agreement also includes provisions for the establishment of a technical center of the company in Ukraine and an increase in the number of new nuclear units from 5 to 9, which Westinghouse plans to build in Ukraine. However, the issue of providing fuel for VVER-440 reactors remains unresolved.

It is worth adding that in February 2023, the President of Ukraine enacted the decision of the National Security and Defense Council of Ukraine on the introduction of economic sanctions against Rosatom and 199 companies that are part of its structure[91]. The restrictions apply to all financial and economic operations of these companies and will be in effect for 50 years.

In May 2023, the Verkhovna Rada of Ukraine adopted an appeal to foreign parliaments, the European Parliament, the International Atomic Energy Agency, and its member states to take measures to reduce cooperation with the Russian Federation in the nuclear energy sector and impose sanctions on enterprises and organizations of the Russian nuclear industry complex[92].

Main aspects of Rosatom's activity in Asia and the Middle East:

Rosatom has a significant presence in the Asian region. Unlike Europe, there are no old VVER-440 reactors here, but judging from the large number of Rosatom's representatives, it is highly likely that Russia is emphasizing the development of cooperation with countries in this region.

Bangladesh

Rosatom is constructing Bangladesh's first nuclear power plant, the Rooppur Nuclear Power Plant. Currently, the construction of two reactors with a capacity of 1200 MW each is underway[93]. It is expected that the Rooppur Nuclear Power Plant will generate 15% of the country's total electricity.

It should be noted that, at the request of the Ministry of Foreign Affairs of Bangladesh, 69 Russian-flagged vessels were prohibited from entering Bangladeshi ports. Among the vessels banned from entering the ports was the Ursa Major, which was transporting cargo for the construction of the Rooppur Nuclear Power Plant[94]. The prohibition on Russian-flagged vessels was introduced jointly by the United States and the European Union. In a comment on this event, the head of the Bangladesh Owners' Association of Ships

[90] Holos Ameriky. Ukraine signed an agreement with the American company Westinghouse for the supply of fuel for NPPs (June 3, 2022). https://www.golosameriki.com/a/kyiv-will-get-nuclear-fuel-from-us-westinghouse/6601951.html

[91] Decree of the President of Ukraine No. 57/2023 "On the decision of the National Security and Defense Council of Ukraine of February 5, 2023, 'On the application and introduction of changes to personal special economic and other restrictive measures (sanctions).'" https://www.president.gov.ua/documents/572023-45713

[92] Resolution of the Verkhovna Rada of Ukraine; Appeal dated May 2, 2023, No. 3076-IX. https://zakon.rada.gov.ua/laws/show/3076-20#Text

[93] Rooppur Nuclear Power Plant project (Bangladesh) http://www.rooppurnpp.gov.bd/site/page/cd617ec4-06fb-4975-9c97-4dad02066c40/History-of-Rooppur-Project-

[94] New Age Bangladesh. Bangladesh bars Russian vessel under US sanction from entering its territory (30 of December 2022). https://www.newagebd.net/article/190263/bangladesh-bars-russian-vessel-under-us-sanction-from-entering-its-territory

(BOGSA) stated that if any goods arrive in Bangladesh on these vessels, Bangladesh will be subject to similar restrictions. However, the majority of its international trade is carried out with the EU and the US[95].

India

India, along with Russia, is a member of the BRICS union. The declaration[96] adopted at the BRICS summit in April 2011 includes a point on cooperation in the field of nuclear energy, which is considered an important element in the future energy balance of BRICS countries. The main activity within the interagency BRICS dialogue is the meetings of energy ministers of member countries. They have a common energy platform (BRICS Energy Research Platform) that provides an information-analytical component. Moreover, attention should be given to BRICS's active policy on cooperation in training personnel for the nuclear energy sector and implementing programs for youth, which serves as a soft power tool, which will be discussed in more detail in the following sections of our analytical report.

In India, Rosatom is implementing a project to build 4 energy units at the Kudankulam Nuclear Power Plant on a credit basis, equipped with VVER-1000 reactors[97][98]. The nuclear power plant is owned by the Indian Nuclear Power Corporation. Additionally, there is a Rosatom South Asia office in Mumbai.[99]

[95] Bdnews24.com. Bangladesh bars Russian ships from its maritime territory after US sanctions (13 of February 2023). https://bdnews24.com/bangladesh/k7y8tc3exk

[96] President Of Russia. Declaration adopted at the BRICS Summit (Sanya, Hainan Island, China, April 14, 2011). ttp://www.kremlin.ru/supplement/907

[97] Nuclear Power Corporation of India Limited. KKNPP-3&4. https://www.npcil.nic.in/writereaddata/CMS/202212140139061360649KKNPP_3_4_english.pdf

[98] Nuclear Power Corporation of India Limited. KKNPP-5&6. https://www.npcil.nic.in/writereaddata/CMS/202212140144583538144KKNPP_5_6_english.pdf

[99] Rosatom. International cooperation. Rusatom is an international network. https://rosatom.ru/about/international/rusatom_international_network/

Construction at the Kudankulam Nuclear Power Plant [100]

Iran

In Iran, Rosatom is building the Bushehr Nuclear Power Plant. Interestingly, the official Rosatom website does not include the Bushehr Nuclear Power Plant in the general list of nuclear power plants being constructed abroad[101]. However, publications and statements by official representatives on other web pages of the same site provide grounds to believe that the construction of the plant is indeed taking place.

Information about providing credit for the construction of the Bushehr Nuclear Power Plant in Iran is also not available on the official Rosatom website. In the annual report of the Russian Social and Ecological Union on the state of the nuclear industry in Russia, it is mentioned that the construction is funded by the local customer[102]. However, during research of open sources, information about Iran's debt to Russia for the construction of the Bushehr Nuclear Power Plant was found. This includes a public statement made by Ali Akbar Salehi, the head of the Atomic Energy Organization of Iran (AEOI), on June 26, 2021, regarding Iran's debt of 500 million euros[103] to Russia, which could be a means of influencing Iran's supply of weapons to Russia. The absence of information about the Bushehr Nuclear Power Plant in the general list of nuclear power plants under construction most likely indicates that the construction of the plant is carried out with credit funds. The fact of Russia's cooperation with Iran in the field of nuclear energy under the conditions of the Iranian regime's attempt to acquire nuclear weapons obviously carries reputational risks for Russia and even the possibility of additional economic sanctions.

[100] Rosatom. Nuclear power plants that are being built. https://rosatom.ru/production/design/stroyashchiesya-aes/
[101] Rosatom. Nuclear power plants that are being built. https://rosatom.ru/production/design/stroyashchiesya-aes/
[102] Public organization Social and Ecological Union.
https://rusecounion.ru/sites/default/files/rseunuclearstatusreport2021.pdf.pdf
[103] TASS. Iran owes Russia €500 million for the construction of the Bushehr NPP (June 26, 2021).
https://tass.ru/ekonomika/11762063

Kazakhstan

Kazakhstan is one of the largest suppliers of uranium ore to Rosatom, which holds shares in uranium mining enterprises and carries out mining operations in certain areas of Kazakh deposits. For example, in December 2022, Rosatom acquired the Stepnogorsk Mining and Chemical Plant, effectively obtaining a 49% stake in the LLC SP Budyonnovskoye (the remaining 51% belongs to Kazakhstan). The Stepnogorsk Mining-Chemical Plant is developing two out of seven sites of the Budenovsk deposit in the Kazakh state-owned company Kazatomprom. According to forecasts, Budenovsk will account for over 10% of the world's uranium production over the next three years[104]. This allows Russia to ensure a stable supply of uranium ore. The situation regarding the purchase is not entirely transparent: official statements or reports from Rosatom do not identify the buyer; during the negotiation process, top managers of Kazatomprom, including the general, commercial, and financial directors, resigned. It was also noted that the Sovereign Wealth Fund of Kazakhstan (Samruk-Kazyna - KazTAG), owned by the Kazakhstan government, was interested in the agreement[105].

In addition, a special roadmap for the construction of a nuclear power plant has been developed together with Rosatom, but the supplier has not been finalized yet. As of January 11, 2023, this was announced by the Prime Minister of Kazakhstan, Alihan Smailov[106]. Moreover, there is no consensus in Kazakh society regarding the idea of building a nuclear power plant. Concerns are expressed about various issues: the potential long-term credit dependence on Russia, possible environmental hazards, and the threat that, in the context of the situation at the Zaporizhzhia Nuclear Power Plant, where the nuclear station is not just a source of electricity generation but also a tool for manipulation and intimidation, has taken on a new meaning[107].

An office of Rosatom Central Asia is located in Astana[108].

[104] Kaz TAG. The Agreement with Rosatom led to an outflow of top managers from Kazatomprom - Bloomberg (May 16, 2023). https://kaztag.kz/ru/news/sdelka-s-rosatomom-privela-k-ottoku-top-menedzherov-iz-kazatomproma-bloomberg

[105] As mentioned earlier,

[106] Tengri News. There was no such decision - Smayilov on the choice of Rosatom as the supplier for NPPs (January 11, 2023). https://tengrinews.kz/kazakhstan_news/takogo-resheniya-ne-smailov-vyibore-rosatoma-postavschikom-488269/

[107] Radio Azattyk. Eco-activists urge the authorities to ban the construction of NPPs in Kazakhstan, citing "nuclear blackmail" at the Zaporizhzhia NPP (March 1, 2023). https://rus.azattyq.org/amp/32295025.html

[108] Rosatom. International cooperation. Rusatom is an international network. https://rosatom.ru/about/international/rusatom_international_network/

Kyrgyzstan

In addition, a Memorandum on the construction of a small-capacity[109] nuclear power plant has been signed with Rosatom, but according to the Minister of Energy of Kyrgyzstan, Taalaibek Ibraev, it is not an agreement on joint construction but only a roadmap for it[110].
Furthermore, Rosatom's subsidiary, JSC NovaWind, and the Ministry of Energy of Kyrgyzstan have signed a Memorandum of Understanding and Cooperation in the field of wind energy projects[111].

There is also a business representation office of Rosatom in Bishkek[112].

China

Within the framework of the strategic nuclear partnership agreements signed between Russia and China in June 2018, Rosatom is implementing projects for the construction of power units at two nuclear power plants in China[113]:

- Xudapu Nuclear Power Plant (2 units with VVER-1200 reactors)[114];
- Tianwan Nuclear Power Plant (2 units with VVER-1200 reactors)[115].

If all the reactors are completed and commissioned, Tianwan Nuclear Power Plant will become the world's most powerful station.

The signing of these agreements has also launched projects for the joint construction of a Chinese demonstration fast neutron reactor and the supply of batches of Russian radiopharmaceutical thermal blocks[116].

Background: *Radioisotope heat units are used as part of radioisotope thermoelectric generators, where the heat released during the decay of radioactive isotopes is converted into electrical energy. Such generators are used to power space research missions.*

[109] Rosatom. Rosatom and Kyrgyzstan have agreed to cooperate in the construction of a small capacity nuclear power plant (January 20, 2022). https://rosatom.ru/journalist/news/rosatom-i-kirgiziya-dogovorilis-o-sotrudnichestve-v-sooruzhenii-atomnoy-stantsii-maloy-moshchnosti/
[110] Atomic Energy. Rosatom is studying land plots in Kyrgyzstan for potential construction of a 110-megawatt dual-unit small NPP (January 19, 2023). https://www.atomic-energy.ru/news/2023/01/19/132135
[111] Atomic Energy. Russian NovaWind and the Ministry of Energy of the Kyrgyz Republic have signed a memorandum of cooperation (February 21, 2023). https://www.atomic-energy.ru/news/2023/02/21/132989
[112] Rosatom. International cooperation. Rusatom is an international network. https://rosatom.ru/about/international/rusatom_international_network/
[113] Rosatom. Nuclear power plants that are being built. ttps://rosatom.ru/production/design/stroyashchiesya-aes/
[114] Rosatom. Xuidapu nuclear power plant (China). https://ase-ec.ru/about/projects/aes-syuydapu/
[115] Rosatom. Tianwan nuclear power plant (China). https://ase-ec.ru/about/projects/aes-tyanvan/
[116] Rosatom. News. Russia and China have signed a record package of agreements on nuclear cooperation. https://rusatom-energy.ru/media/rosatom-news/rossiya-i-kitay-podpisali-rekordnyy-paket-soglasheniy-o-sotrudnichestve-v-yadernoy-sfere/

It is worth noting that an office of Rosatom East Asia is located in Beijing[117]. Additionally, China is a member of the BRICS countries, as mentioned earlier, and therefore engages in joint activities within the BRICS initiatives in the field of nuclear energy cooperation.

Myanmar

On February 6, 2023, Russia and Myanmar signed an intergovernmental agreement on cooperation, which includes the construction of a small-capacity nuclear power plant[118]. This potential cooperation has raised concerns from the United States, as the current government in Myanmar is military, which seized power in a coup[119]. Furthermore, according to the Minister of Investments and Foreign Economic Relations of Myanmar, Russia is a key supplier of energy resources and agricultural products to the country[120].

Additionally, Russia and Myanmar have several joint projects related to gas, mineral resources, and tourism[121].

Signing ceremony of the agreement between Russia and Myanmar[122]

In the context of the partnership between Russia and Myanmar, it is important to remind that Russia is a supplier of weapons to this country. According to the statement of the UN special representative for

[117]Rosatom. International cooperation. Rusatom is an international network. https://rosatom.ru/about/international/rusatom_international_network/

[118] Rosatom's Telegram channel. Russia and Myanmar have signed an intergovernmental agreement on cooperation in the peaceful use of atomic energy (February 6, 2023). https://t.me/rosatomru/1490

[119] Holos Ameriky. The US is concerned about the cooperation between the Myanmar junta and Russia in the nuclear sphere (February 16, 2023). https://ukrainian.voanews.com/a/us-worried-by-myanmar-junta-russia-expanding-nuclear-cooperation/6965680.html

[120] Izvestiya. Myanmar has named Russia as a key supplier of nuclear fuel (September 6, 2022). https://iz.ru/1391011/2022-09-06/mianma-nazvala-rossiiu-kliuchevym-postavshchikom-energonositelei

[121] Izvestiya. An expert talks about the development of relations between Russia and Myanmar (September 8, 2022). https://iz.ru/1392309/2022-09-08/ekspert-rasskazal-o-razvitii-otnoshenii-rossii-i-mianmy

[122]Rosatom. Russia and Myanmar have signed an intergovernmental agreement on cooperation in the use of atomic energy for peaceful purposes (February 6, 2023). https://www.rosatom.ru/journalist/news/rossiya-i-myanma-podpisali-mezhpravitelstvennoe-soglashenie-o-sotrudnichestve-v-oblasti-ispolzovaniya/

Myanmar, Tom Andrews, Moscow is currently the largest supplier of weapons to the Myanmar government. According to his report published in May 2023, after the coup, the new government of Myanmar received weapons from Russia worth over 400 million dollars. The UN report identifies 28 Russian organizations, including state-owned ones, as suppliers, with 16 of them being subjected to Western sanctions due to the war in Ukraine.

According to the UN special commission, Russian weapons in Myanmar may be used to commit war crimes and crimes against humanity[123].

UAE

Rosatom and the UAE are implementing several joint projects, including the supply of enriched uranium for the Barakah Nuclear Power Plant[124]. It should be noted that the project for the construction of the nuclear power plant was initially carried out by the South Korean company Korea Electric Power Corporation, which is also a significant player in the global market for nuclear power plant construction[125].

Additionally, Rosatom has contracts for supplying radioactive isotopes and equipment for hazardous industrial waste processing to the UAE. Together with the UAE, Rosatom plans to establish a working group to explore the possibilities of using small-capacity nuclear power plants in the UAE[126].

An office of Rosatom Middle East and North Africa is located in Dubai[127].

Saudi Arabia

In February 2022, Saudi Arabia confirmed the establishment of the state-owned Nuclear Holding Company, which will be the main player in the nuclear energy sector in the country[128]. Additionally, a tender was launched for the construction of a nuclear power plant in the country, and it was reported that Rosatom submitted documents to participate in this tender[129].

[123] BBC News. Russian service. BBC investigation: Russia is the largest supplier of weapons to the Burmese junta (May 31, 2023). https://www.bbc.com/russian/news-65767073.amp
[124] RIA NOVOSTI. Russia-UAE interstate relations (October 11, 2022). https://ria.ru/20221011/oae-1822957135.html
[125] NS ENERGY. Barakah Nuclear Power Plant, Abu Dhabi. https://www.nsenergybusiness.com/projects/barakah-nuclear-power-plant-abu-dhabi/#
[126] TASS. Rosatom and the UAE will create a working group on small capacity NPPs (January 25, 2022).https://tass.ru/ekonomika/13515471
[127] Rosatom. International cooperation. Rusatom is an international network. https://rosatom.ru/about/international/rusatom_international_network/
[128] World Nuclear Association. Nuclear Power in Saudi Arabia. https://world-nuclear.org/information-library/country-profiles/countries-o-s/saudi-arabia.aspx
[129] Energetychna polityka. Nuclear energy of the 21st century: accessibility, environmental friendliness, reliability (December 13, 2022). https://energypolicy.ru/atomnaya-energiya-xxi-veka-dostupnost-ekologichnost-nadezhnost/business/2022/12/13/

Singapore

In a report by the Energy Market Authority of Singapore, the goal of achieving zero carbon emissions by 2050 is outlined, which can be achieved through the development of nuclear energy[130]. According to the report, nuclear generation can fulfill about 10% of Singapore's energy needs. The report also mentions China, France, the USA, and Russia as potential suppliers of nuclear technologies to the country. Considering that there is an office of Rosatom Southeast Asia[131] in Singapore, there is a possibility of involving the Russian side in this matter.

Tajikistan

The Tajikistan case is interesting because despite the country having a less developed nuclear energy sector, Rosatom's presence is established in another form: a joint venture (Sangtuda Hydroelectric Power Plant[132]) between Russia and Tajikistan located in the Halt region, with Rosatom owning the majority share (60%). According to information on the official website of Sangtuda HPP, it contributes up to 11% of the total electricity generation in Tajikistan[133].

Uzbekistan

According to the World Nuclear Association, Uzbekistan ranks 11th in the world in terms of uranium deposits, accounting for 132 thousand tons (2% of global reserves)[134]. In 2020, Uzbekistan extracted 3,500 tons of uranium, ranking fifth in the world for uranium production in 2020[135]. Uzbek media also mentions the country's ambition to enter the top three global uranium producers[136].

There is information in open sources regarding Rosatom's plans to build a nuclear power plant in Uzbekistan, but it remains somewhat controversial. In 2018, the Uzbek government reached an agreement with Rosatom for the construction of a nuclear power plant[137]. In October 2018, the presidents of Russia and Uzbekistan "symbolically pressed the launch button for the project's implementation."[138] In

[130] Energy Market Authority. Charting the Energy Transition to 2050. Energy 2050 Committee Report (March 2022). https://www.ema.gov.sg/cmsmedia/Publications_and_Statistics/Publications/Energy-2050-Committee-Report.pdf
[131] Rosatom. International cooperation. Rusatom is an international network. https://rosatom.ru/about/international/rusatom_international_network/
[132] Sangtuda HPP-1http://www.sangtuda.com/
[133] Sangtuda HPP-1. Activity. https://sangtuda.com/ru/activities/inf
[134] World Nuclear Association. World Uranium Mining Production. https://world-nuclear.org/information-library/nuclear-fuel-cycle/mining-of-uranium/world-uranium-mining-production.aspx
[135] World Nuclear Association. World Uranium Mining Production. https://world-nuclear.org/information-library/nuclear-fuel-cycle/mining-of-uranium/world-uranium-mining-production.aspx
[136] Kursiv. Uzbekistan aims to enter the top three leading countries in uranium mining in the world (November 24, 2022). https://kz.kursiv.media/2022-11-24/uzbekistan-sobiraetsya-vojti-v-trojku-stran-liderov-po-dobyche-urana-v-mire/
[137] President Of the Republic of Uzbekistan. Nuclear energy will be developed for peaceful purposes (July 10, 2018).https://president.uz/ru/lists/view/1894
[138] President Of the Republic of Uzbekistan. Presidents of Uzbekistan and Russia launched the implementation of the nuclear power plant construction project (October 19, 2018). https://president.uz/ru/lists/view/2100

July 2021, the Russian ambassador to Uzbekistan spoke about the advantages of Russia's credit-based[139] construction of the nuclear power plant, but there is no information about the signing of a direct contract for construction yet.

It is worth noting that Rosatom has a regional office in Tashkent[140]. Indicating Russia's desire to increase its presence in Uzbekistan's nuclear market.

Japan

In Tokyo, there is a regional office of Rosatom[141], with the goal of promoting "cooperation in nuclear medicine and scientific interaction in the field of fast neutron reactors."[142]

Background: A fast neutron reactor is a nuclear reactor without neutron moderators in its active zone (water or graphite).

Back in 2007, there were reports of a partnership between Rosatom and the Japanese company Toshiba, but this process did not materialize, and instead, the companies hold competing positions in the market.

Main Aspects of Rosatom's Activities in African Countries:

Russia continues to strengthen cooperation with African countries, including in the nuclear industry. Using the narrative of anti-colonial struggle, Russia leverages its influence to establish cooperation with African countries that require expanded access to electricity[143].

Work with African countries has been ongoing systematically and for a long time[144], although there is currently limited implementation in the form of nuclear power plant construction, except for the nuclear power plant in **Egypt**. However, in the current context, where Russia needs to seek new partners worldwide, the previous agreements with African countries in the energy sector may serve as a catalyst for more concrete projects or additional mechanisms of influence.

In particular, as early as 2016, Russia signed agreements for cooperation with Tanzania, Uganda, Kenya, Zambia, Ghana, and Nigeria, demonstrating its intent to become a key partner in nuclear development

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[139] Hazeta UZ. "If a country produces and exports, it is not afraid of loans" - Russian Ambassador to Uzbekistan (July 29, 2021). https://www.gazeta.uz/ru/2021/07/29/aes/

[140] Rosatom. International cooperation. Rusatom is an international network. https://rosatom.ru/about/international/rusatom_international_network/

[141] Rosatom. International cooperation. Rusatom is an international network. https://rosatom.ru/about/international/rusatom_international_network/

[142] Strana Rosatom. Do not joke with the Japanese (September 21, 2019). https://strana-rosatom.ru/2019/09/21/ne-shutite-s-yaponcami/

[143] The UN. Development of the renewable energy sector and technologies in West Africa. https://www.un.org/ru/chronicle/article/22091

[144] Nuclear Engineering International. Atomexpo attracts 65 countries (24 of November 2022). https://www.neimagazine.com/news/newsatomexpo-attracts-65-countries-10381392/

for African countries[145]. Confirming this intent, in October 2022, the Director-General of Rosatom, Oleksii Likhachov, stated that "*the African continent will become a place for the development of global nuclear energy*."[146]

Ethiopia

In October 2019, during the Russia-Africa Economic Forum, Russia and Ethiopia signed a bilateral agreement on cooperation in the peaceful use of nuclear energy. In April 2021, two memorandums were signed between Rosatom and Ethiopia's Ministry of Innovation and Technology: one on training and preparing personnel in the field of nuclear energy in Ethiopia and another on shaping positive public opinion regarding nuclear energy in the country[147]. A favorable public opinion and the presence of specialists in the job market may indicate the groundwork for future activities.

There have been reports from Ethiopian officials about the implementation of a nuclear power plant project[148], but the construction phase has not yet begun.

Egypt

In 2008, Russia and Egypt signed an agreement for cooperation in the peaceful use of nuclear energy[149]. Under this agreement, Rosatom provides a loan for the construction of four nuclear power units at the El Dabaa Nuclear Power Plant. The project includes VVER-1200 reactors.

Additionally, there are plans to open a branch of the National Research Nuclear University "Moscow Engineering Physics Institute" in Egypt, with the main goal of training personnel for the upcoming nuclear power plant [150].

Namibia

As of 2022, Namibia ranked third in the world in terms of uranium production[151]. Uranium is mined in Namibia by two Chinese companies: China General Nuclear Power Corporation (CGN) and China National Nuclear Corporation (CNNC); Australian Paladin Energy Ltd; and Rosatom. Rosatom is implementing the Kryla project in Namibia, aimed at prospecting for uranium deposits. However, such activities raise

[145] AllAfrika. Tanzania: Russian Firm to Build Nuclear Reactor in Tanzania (31 of October 2016). https://allafrica.com/stories/201611010711.html

[146] RIA NOVOSTI. Africa will become a place for the development of nuclear energy, says Likhachev (November 21, 2022). https://ria.ru/20221121/energetika-1833071976.html

[147] Rosatom. Rosatom and Ethiopia will develop human resources and shape positive public opinion on nuclear energy (April 15, 2021). https://rosatom.ru/journalist/news/rosatom-i-efiopiya-budut-razvivat-kadrovyy-potentsial-i-formirovat-pozitivnoe-obshchestvennoe-mnenie/

[148] RIA NOVOSTI. The Ethiopia-Russia nuclear power plant project is progressing as planned, says the Ambassador (June 14, 2022). https://ria.ru/20220614/efiopiya-1795123450.html

[149] Rosatom. Projects. El Dabaa Nuclear Power Plant (Egypt). https://ase-ec.ru/about/projects/aes-el-dabaa/

[150] RIA NOVOSTI. Russia will open a branch of MEPhI in Egypt (February 13, 2023). https://ria.ru/20230213/mifi-1851637185.html

[151] World Nuclear Association. World Uranium Mining Production. https://world-nuclear.org/information-library/nuclear-fuel-cycle/mining-of-uranium/world-uranium-mining-production.aspx

concerns among local residents due to potential risks of groundwater contamination[152]. There are varying reports in open sources on this matter, with Russian "RIA Novosti" citing the Namibian ambassador to Russia stating that Namibia's government and Rosatom do not have disagreements on this issue, while "Voice of America" reported on the suspension of prospecting activities[153].

Nigeria

In March 2022, the Director-General of the Nigerian Nuclear Regulatory Authority, Yau Idris, announced that the country had initiated a tender for the construction of a 4-unit nuclear power plant[154]. At that time, agreements related to the nuclear power plant project had been signed with South Korea, France, India, and Russia. On October 30, 2022, Russia and Nigeria signed another agreement for the development of nuclear power plant construction and operation projects[155]. However, information about the winner of the tender is currently absent in open sources and official statements from Nigerian representatives.

Republic of South Africa

In South Africa, there is the Koeberg Nuclear Power Plant, where American company Westinghouse supplies fuel. This process was governed by a nuclear cooperation agreement between South Africa and the USA, which expired on December 4, 2022[156]. Currently, negotiations are underway to sign a new agreement (since 2018), but the authorization for fuel supply has been temporarily suspended. The nuclear power plant is currently using previously acquired fuel stocks, with the next supply estimated to take place in early 2024. Considering the lengthy process of signing a new agreement and the fact that the office Rosatom Central and Southern Africa is located in Cape Town, it is possible that Rosatom will offer its services for supplying fuel to the nuclear power plant. It is also worth mentioning that South Africa is a member of BRICS, and therefore participates in cooperation in the nuclear energy sector with Russia and other union countries.

In the history of Russia-South Africa relations in 2022, it is important to note the statement made by the U.S. Ambassador to South Africa, Ruben Brigety, during a briefing to local journalists, where he expressed the belief that a Russian ship exported weapons and ammunition from South Africa in December 2022[157].

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[152] Holos Ameriky. Namibia refused Rosatom's development of uranium deposits (December 30, 2022). https://www.golosameriki.com/a/namibia-halts-russian-uranium-exploration-over-environmental-concerns/6896907.html

[153] Holos Ameriky. Namibia refused Rosatom's development of uranium deposits (December 30, 2022). https://www.golosameriki.com/a/namibia-halts-russian-uranium-exploration-over-environmental-concerns/6896907.html

[154] World Nuclear News. Nigeria moving ahead on nuclear power plant plan (18 of March 2022). https://www.world-nuclear-news.org/Articles/Nigeria-moving-ahead-on%C2%A0nuclear-power-plant-plan

[155] Rosatom. Russia and Nigeria signed agreements for the development of atomic projects. https://rusatom-energy.ru/media/rosatom-news/rossiya-i-nigeriya-podpisali-soglasheniya-o-razvitii-atomnykh-proektov/

[156] South African Government. Mineral Resources and Energy on expiry of South Africa and USA Nuclear Cooperation Agreement (3 of February 2023). https://www.gov.za/speeches/dmre-allays-3-feb-2023-0000

[157] Reuters. US envoy says Russian ship picked up weapons in South Africa (11 of May 2023). https://www.reuters.com/world/us-envoy-says-russian-ship-picked-up-arms-south-africa-2023-05-11/

In our opinion, the potential cooperation between Russia and South Africa in the nuclear sphere may serve as a means of influencing the supply of weapons from South Africa to Russia.

Tanzania

Tanzania possesses uranium ore deposits, including the Mkuju River deposit, which is owned by Mantra Tanzania, a subsidiary of Uranium One (managed by Rosatom)[158]. However, the process of developing the deposit and extracting the ore has been quite lengthy, experiencing several freezes[159].

Meanwhile, Rosatom has been popularizing its presence in Tanzania through soft power. For example, various activities have been organized, including:

- A press tour for journalists from Tanzania, during which participants visited nuclear laboratories in Russia[160];
- An excursion for representatives of the National Defense College of Tanzania at the Obninsk NPP[161].

Mkuju River Project employees[162]

[158] TASS. Rosatom announced the start of the development of uranium deposits in Tanzania in the coming years (November 22, 2022). https://tass.ru/ekonomika/16398057

[159] Version. Prolit po-chornomu. A decade of Rosatom's expenditures in Tanzania does not give hope for profitability (March 9, 2022). https://versia.ru/desyatiletie-rasxodov-rosatoma-v-tanzanii-ne-dayot-nadezhdy-na-nachalo-okupaemosti

[160] Joint Institute for Nuclear Research. Journalists from Tanzania at JINR (September 15, 2017). http://www.jinr.ru/posts/zhurnalisty-iz-tanzanii-v-oiyai/

[161] Rosatom. Presscenter. A delegation from the United Republic of Tanzania visited the world's First NPP (June 6, 2019).https://www.ippe.ru/presscenter/all-news/2019/688-delegation-tanzania

[162] Rosatom. Uraniun One Group. Tanzania. https://uranium1.com/ru/our-operations/#tanzania

Main aspects of Rosatom's activities in Latin American countries.

Analyzing Rosatom's activities in Latin America, it can be said that it is only beginning to actively explore the nuclear power market in these regions. In particular, the head of Rosatom's regional center in Latin America, Ivan Dibov, stated at the "Atomexpo-2022" conference that Rosatom has "serious plans for cooperation" with Cuba and Argentina[163]. Rosatom also has several projects in other countries on the continent.

Bolivia

In Bolivia, Rosatom is constructing a Nuclear Research and Technology Center, for which a research reactor has already been manufactured[164]. Bolivian journalists were also invited to cover the lives of foreign students at Russian nuclear institutes[165]. These initiatives may aim to attract more potential students who will work at the mentioned Nuclear Research and Technology Center and other Rosatom companies in the future.

Brazil

Brazil currently operates a single nuclear power plant, Angra, equipped with two operating reactors. The construction of the third reactor began in 1984 but was suspended several times due to corruption investigations related to state contracts. The latest construction, undertaken by the Brazilian company Eletronuclear, started in 2022 but was frozen again in 2023. Before Russia's full-scale invasion of Ukraine, in February 2022, President Vladimir Putin[166] and the head of Russia's Ministry of Economic Development stated that Russia[167] intends to participate in the completion of this nuclear power plant.

In December 2022, Internexco GmbH, a subsidiary of Techsnabexport (founded by Rosatom), and the Brazilian state-owned company Industrias Nucleares do Brasil signed a contract for 100% assurance of the operation of the Angra nuclear power plant from 2023 to 2027[168].

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[163] TASS. Rosatom announced its readiness to cooperate with Latin America (November 21, 2022). https://tass.ru/ekonomika/16390757/amp

[164] Rosatom. Rosatom completed the assembly of a research reactor for the Center for Nuclear Research and Technology in Bolivia (April 28, 2023). https://rosatom.ru/journalist/news/rosatom-zavershil-kontrolnuyu-sborku-issledovatelskogo-reaktora-dlya-tsentra-yadernykh-issledovaniy-/?sphrase_id=4007016

[165] Nuclear energy. https://www.atomic-energy.ru/news/2022/11/30/130736

[166]Ekonomika. Putin: "Rosatom" is ready to build NPPs in Brazil (February 16, 2022). https://www.vesti.ru/finance/article/2678159

[167] TASS. Russia may participate in the completion of the Brazilian NPP Angra-3 (February 15, 2022). https://tass.ru/ekonomika/13714517

[168] Rosatom. Key events of Rosatom and its subsidiaries in 2022 (December 30, 2022). https://www.rosatom.ru/journalist/smi-about-industry/klyuchevye-sobytiya-rosatoma-i-ego-struktur-v-2022-godu/?sphrase_id=3997005

It is worth mentioning that Rio de Janeiro is the location of the regional center Rosatom Latin America. Brazil is a member of BRICS, as mentioned above, and thus participates in cooperation in the nuclear energy field with Russia and other member countries.

Mexico

Mexico hosts the only nuclear power plant, Laguna Verde, which supplies only 3-4% of the country's electricity[169], while oil accounts for 10% and gas for 63%. However, Mexico has passed the Energy Transition Law, which states that by 2033, the country should derive 39.9% of its energy from clean sources. Therefore, the issue of building new nuclear power plant units is becoming increasingly relevant. Information about Rosatom's attempts to engage in construction is not available in open sources, but it cannot be ruled out as a potential possibility. Moreover, at the "Atomexpo-2022" forum, Rosatom's fuel company TVEL and the Mexican industrial company ABC Nuclear Products S.A. de C.V. signed a memorandum of understanding regarding potential cooperation in the final stage of the nuclear fuel cycle[170].

Nicaragua

Nuclear energy in Nicaragua is not significantly developed, but other non-energy applications of nuclear energy exist, as in other countries worldwide. In March 2023, a cooperation agreement was signed between Russia and Nicaragua in the field of non-energy applications of nuclear energy for peaceful purposes[171]. This includes areas such as agriculture, medicine, and science.

Reference: *Non-energy applications of nuclear energy include hydrogen production, technological heat for industrial purposes, district heating, desalination of seawater, production of synthetic fuels and chemicals, cooling, and refrigeration[172].*

Isotope Production

Rosatom is a significant player in the non-nuclear global market, including isotope production (foreign sales exceeded $20.6 million in 2022)[173]. According to Rosatom's information, it has the most extensive

[169] World Nuclear News. Mexican nuclear cleared to run into 2050s (30 of August 2022). https://world-nuclear-news.org/Articles/Mexican-nuclear-cleared-to-run-in-2050s

[170] Rosatom. Results of 2022. https://rosatomnewsletter.com/ru/2022/12/22/year-in-review-2/

[171] Rosatom. Russia and Nicaragua signed an agreement on cooperation in non-energy use of nuclear technologies (March 29, 2023). https://rosatom.ru/journalist/news/rossiya-i-nikaragua-podpisali-soglashenie-o-sotrudnichestve-v-sfere-neenergeticheskogo-ispolzovaniya/?sphrase_id=4008411

[172] UNECE. Review of nuclear energy technologies. https://unece.org/sites/default/files/2021-08/Nuclear%20brief_RU.pdf

[173] Rosatom. JSC PO EKHZ achieved a record foreign revenue from the implementation of isotope production in 2022 (February 7, 2023). https://www.rosatom.ru/journalist/news/ao-po-ekhz-v-2022-godu-poluchilo-rekordnuyu-zarubezhnuyu-vyruchku-ot-realizatsii-izotopnoy-produktsi/

variety of isotopes in the world[174] and ranks among the top five largest global isotope producers. Russia houses no less than 30% of the world's reactor fleet used for isotope production on an industrial scale. Five companies of Rosatom are involved in isotope production: the Research Institute of Physical and Chemical Problems named after L. Ya. Karpov, the Institute of Reactor Materials (IRM), the Scientific Research Institute of Atomic Reactors, Mayak, and Rosenergoatom[175].

While Russia is not the primary producer of isotopes in the world, reports from the World Nuclear Association indicate its ambition to increase its market share[176]. In January 2023, construction began on a medical isotope plant in Obninsk, Russia, for the production of iodine-131, samarium-153, and molybdenum-99, as well as active radiopharmaceuticals based on lutetium-177, actinium-225, and other isotopes.

Overall, Rosatom plans to launch production lines by 2025, indicating its intention to claim a more significant role in this sphere and, therefore, gain more influence.

Reference: *Radioisotopes are widely used in nuclear medicine for the diagnosis and treatment of oncological, cardiological, and other diseases; in industry, including food product sterilization, medical products and materials, as well as in scientific research[177].*

The Soft Power of Rosatom

In addition to direct influence through intergovernmental interactions, Rosatom employs soft power to influence societies in other countries. Soft power refers to the ability to influence actions, behaviour, or values of others indirectly, without resorting to force or material incentives, using other forms of motivation[178].

For example, Rosatom organizes the annual forum "Atomexpo," which was attended by representatives from 65 countries in 2022[179]. Rosatom also partners with the International Youth Forum "Russia-Africa:

[174] Strana Rosatom. The Russian market of radiopharmaceuticals may double by 2030 (April 7, 2022). https://strana-rosatom.ru/2022/04/07/k-2030-godu-rossijskij-rynok-radiofarmpr/

[175] Rosatom. Big plans for the nuclear pharma (May 29, 2022). https://rosatomnewsletter.com/ru/2022/05/29/nuclear-pharmas-grand-plans/

[176] World Nuclear Association. Radioisotopes in Medicine. https://www.world-nuclear.org/information-library/non-power-nuclear-applications/radioisotopes-research/radioisotopes-in-medicine.aspx

[177] Rosatom. Rosatom presented isotope products at the International Conference in India (January 13, 2023).https://rosatom.ru/journalist/news/rosatom-predstavil-izotopnuyu-produktsiyu-na-mezhdunarodnoy-konferentsii-v-indii/

[178] Detector media. "Smart power" against hybrid threats (September 29, 2017). https://ms.detector.media/manipulyatsii/post/19733/2017-09-29-rozumna-syla-proty-gibrydnykh-zagroz/

[179] Rosatom. International Forum "ATOMEXPO-2022" attracted more than 3,000 participants (November 23, 2022). https://www.rosatom.ru/journalist/news/mezhdunarodnyy-forum-atomekspo-2022-privlek-bolee-3-tys-uchastnikov/?sphrase_id=4360976

Nuclear Education for Sustainable Development,"[180] the International Women in Nuclear Forum[181], and more.

XII International Forum "Atomexpo-2022"[182]

In 2018, Rosatom established a venture capital fund worth 40 million euros for investments in artificial intelligence, renewable and smart energy, 3D printing, new materials, and devices for smart and energy-efficient cities[183].

Significant attention is given to the interaction with foreign students and graduates from the Middle East and Africa[184]. By conducting such events or implementing programs, Rosatom cultivates goodwill and authority among nuclear industry professionals and young people from other countries, which can later serve as a tool to expand cooperation with these nations. Foreign students and graduates who studied in Russian universities may become potential workforce engaged in Rosatom's projects.

Rosatom, in collaboration with the IAEA, also implements a program to train Russian-speaking personnel from Europe and Central Asia, which includes medical staff training in Russian institutions[185].

[180] Rosatom. The III Youth Forum "Russia-Africa: Nuclear Education for Sustainable Development" took place at RUDN with the support of Rosatom (November 29, 2022). https://www.rosatom.ru/journalist/news/v-rudn-pri-podderzhke-rosatoma-proshel-iii-molodezhnyy-forum-rossiya-afrika-yadernoe-obrazovanie-dlya/

[181] Rosatom. The IV International Forum of Women in the Atomic Industry was held in Moscow with the support of Rosatom (December 20, 2022). https://www.rosatom.ru/journalist/news/pri-podderzhke-rosatoma-v-moskve-proshel-iv-mezhdunarodnyy-forum-zhenshchin-atomnoy-otrasli/?sphrase_id=3996961

[182] Rosatom. Photo gallery. https://www.rosatom.ru/journalist/media/photo/?S_ID=1173

[183] Enerdata. Foreign Investments in the European Electricity Sector (02 of July 2020). https://www.enerdata.net/publications/executive-briefing/international-electricity-investments-europe.html

[184] Rosatom. Round table on the interaction between Rosatom's core universities and graduates from the countries of the Middle East and Africa was held at RUDN (March 20, 2023). https://rosatom.ru/journalist/news/v-rudn-proshel-kruglyy-stol-posvyashchennyy-vzaimodeystviyu-opornykh-vuzov-rosatoma-s-vypusknikami-i/?sphrase_id=4007016

[185] IAEA. As a result of the expanded cooperation between the Russian Federation and the IAEA, Russian-speaking oncology specialists have more opportunities for professional training (November 15, 2019). https://www.iaea.org/ru/newscenter/news/v-rezultate-rasshireniya-sotrudnichestva-mezhdu-rossiyskoy-federaciey-i-magate-u-russkoyazychnyh-specialistov-onkologov-poyavlyaetsya-bolshe-vozmozhnostey-dlya-professionalnoy-podgotovki

Another soft power tool is organizing visits of experts, students from educational institutions in the nuclear field, and journalists to Russian enterprises under Rosatom's supervision. Most commonly, these visits include operating nuclear power plants, laboratories, or scientific institutes. We have described examples of such visits in relation to various countries in previous sections.

It is also essential to note the influence and involvement Rosatom has in global structures related to the nuclear energy field. For instance, the Deputy Director-General and Head of the Department of Nuclear Energy of the IAEA is a former top manager of Rosatom-affiliated companies, Mykhailo Chudakov[186]. Nuclear energy experts point out that this position in the IAEA has traditionally been informally reserved for the USSR (Russia). Furthermore, around 100 individuals among the permanent staff of the Agency are Russian citizens[187].

In the context of potential soft power utilization, one should not overlook the extensive number of representations (offices, centers, institutes) in other countries, as mentioned earlier.

Measures Aimed at Restricting Existing and Preventing Potential Influence of Russia through Rosatom.

Political, regulatory, economic, and financial restrictions can be applied by individual countries or groups of countries to curb Russia's influence through Rosatom. The main motivation behind implementing such restrictions is real or potential threats to international and national security posed by Russia, as well as its aggression against Ukraine.

Political restrictions may involve decisions to fundamentally discontinue future and current cooperation with Russia in the nuclear energy field, replacing it with cooperation with companies from democratic countries. The main motivation for imposing this type of restriction is the threats to the national security of the respective countries.

Regulatory restrictions may include the introduction of special approval procedures for the consideration and implementation of projects and initiatives financed and carried out by Rosatom, its affiliated structures, or in its interests, by other economic entities. Such restrictions may require amendments to the national legislation of the countries intending to implement them, and may also necessitate a review of international agreements. These restrictions should be applied until full termination of cooperation with Russia, if immediate cessation of such cooperation is not possible.

[186] IAEA. Head of the Nuclear Energy Department. https://www.iaea.org/ru/o-nas/rukovoditel-departamenta-yadernoy-energii
[187] State Nuclear Regulatory Inspectorate of Ukraine. Acting Chairman of the State Nuclear Regulatory Inspectorate spoke with Glavkom journalists (March 13, 2022). https://snriu.gov.ua/news/vikonuyuchij-obovyazki-golovi-derzhatomregulyuvannya-pogovoriv-z-zhurnalistami-glavkom

Economic restrictions encompass sanctions and measures to deprive Rosatom and its associated entities of monopolistic or significant market positions on global, regional, or national markets.

Financial restrictions involve financial sanctions, such as freezing assets and limitations on access to credit and financial markets and other loans.

The issue of sanctions policy by countries is not subject to comprehensive and detailed research in this report. However, to provide a general overview, it is essential to briefly mention the situation regarding the imposition of sanctions against Rosatom and companies it owns/controls, which are significant global players.

Overall, since the beginning of Russia's armed aggression in 2014, democratic countries have utilized sanctions policy as a method of external counteraction against Russia. They have implemented sectoral sanctions against producers/suppliers of goods, works, and services, as well as personal sanctions. After the large-scale aggression in February 2022, partner countries have continued and expanded the scope of such sanctions. However, imposing sanctions on Rosatom is a complex process due to the extensive network of controlled/subsidiary companies, their legal status (including residency in other countries), and their involvement in government structures and oligarchic groups' activities.

USA

In recent years, to reduce dependence on Russia, the United States has increased its own uranium mining[188], plans to restore its uranium conversion capabilities[189], and is creating a strategic nuclear fuel reserve[190]. Some enterprises and officials of Rosatom are already under US sanctions, including:

- JSC Scientific and Technical Institute of Construction Technology - ATOMSTROY,
- JSC Rusatom Overseas
- PJSC Kovrov Mechanical Plant
- Federal State Unitary Enterprise Hydrographic Company
- Federal State Unitary Enterprise Atomflot and others[191].

[188] EA Daily. US Department of Energy reported a sharp increase in uranium production in the country (June 1, 2023). https://eadaily.com/ru/news/2023/06/01/minenergo-ssha-soobshchilo-o-rezkom-roste-dobychi-urana-v-strane
[189] World Nuclear Association. Uranium Enrichment. https://world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/uranium-enrichment.aspx
[190] World Nuclear News. First contracts awarded for US strategic uranium reserve (16 of December 2022). https://world-nuclear-news.org/Articles/First-contracts-awarded-for-US-strategic-uranium-r;
NUCNET. The Independent Nuclear News Agency. Two Companies Win Contracts for Strategic Uranium Reserve (19 of December 2022). https://www.nucnet.org/news/two-companies-win-contracts-for-strategic-uranium-reserve-12-1-2022
[191] Office of Foreign Assets Control. Sanctions List Search. https://sanctionssearch.ofac.treas.gov/

Reference: *As of June 2023, the USA continues to have the largest capacity in the world with 93 operational commercial reactors. According to the International Atomic Energy Agency's Power Reactor Information System, nuclear power plants provided 18.2% of the country's electricity in 2022*[192]*.*

As of the end of 2022, the US nuclear energy sector still maintains connections with Russia. Specifically, 24% of all uranium imported to the United States comes from Russia[193]*. Additionally, Russia supplied 14% of all enriched uranium imported by the USA*[194]*. Furthermore, Russia provided 33% of the foreign uranium enrichment services ordered by the United States*[195]*. It's worth noting that the volume of such service orders from Russia has decreased compared to 2021. The USA also imports a certain quantity of converted uranium, but due to incomplete data, it is impossible to determine the exact share.*

United Kingdom

At the beginning of 2023, the UK government announced the creation of a £75 million *Nuclear Fuel Fund* aimed at reducing dependence on supplies from Russia.[196] Additionally, the UK has imposed a 35% tariff on the import of Russian radioactive chemical elements and isotopes, including enriched uranium[197].

Reference: *The United Kingdom has nine operational nuclear reactors, which account for 14.2% of the country's total electricity generation*[198]*.*

Several companies and individuals associated with Rosatom are also subject to British sanctions, including[199]:

- **Enterprises:** Federal State Unitary Enterprise All-Russian Scientific Research Institute of Automatics named after N.L. Dukhov, JSC Order of Lenin Scientific and Technical Institute of Power Engineering named after M.O. Dollezhal, Russian Federal Nuclear Center All-Russian Scientific Research Institute of Experimental Physics, Russian Federal Nuclear Center All-Russian Scientific Research Institute of Technical Physics, JSC UMATEX, LLC Renera, JSC TRINITI, State Scientific Center Scientific Research Institute of Atomic Reactors, JSC Scientific and Technical Center for Nuclear and Physical Research, JSC High-Technology Scientific Research Institute of Inorganic Materials named after academician A. A. Bochvar, Federal State Unitary Enterprise Atomflot;
- **Individuals:** Arkadiy Bakhin, Oleksiy Likhachev, Oleksandr Novak, Larysa Brychova, Kyrylo Komarov, Oleksandr Lokshyn, Kostyantyn Denysov, Oleh Kryukov, Andriy Nikipielov, Serhiy

[192] IAEA. Power Reactor Information System. United States of America. https://pris.iaea.org/PRIS/CountryStatistics/CountryDetails.aspx?current=US
[193] U.S. Energy Information Administration. 2022 Uranium Marketing Annual Report. https://www.eia.gov/uranium/marketing/pdf/2022%20UMAR.pdf
[194] Ibid.
[195] Ibid.
[196] GOV.UK. Ministers bolster UK nuclear fuel capacity to squeeze out Russian influence (02 of January 2023). https://www.gov.uk/government/news/ministers-bolster-uk-nuclear-fuel-capacity-to-squeeze-out-russian-influence
[197] GOV. UK. Guidance Additional duties on goods originating in Russia and Belarus (28 of March 2022). https://www.gov.uk/guidance/additional-duties-on-goods-originating-in-russia-and-belarus
[198] IAEA. Power Reactor Information System. United Kingdom. https://pris.iaea.org/PRIS/CountryStatistics/CountryDetails.aspx?current=GB
[199] UK Sanctions List Publication. https://docs.fcdo.gov.uk/docs/UK-Sanctions-List.html

Novikov, Serhiy Obozov, Yuriy Olenin, Andriy Petrov, Illia Rebrov, Viacheslav Ruksha, Mykola Spasky, Yuriy Yakovlev.

EU

Over 99% of the uranium used by EU member states is imported[200]. Due to Rosatom's leading positions in the market of uranium conversion and enrichment, EU countries are heavily reliant on Rosatom.

There is information available in open sources about the intentions to impose sanctions against Rosatom, but currently, only one of the numerous enterprises under Rosatom - Rosatomflot, which services the fleet of nuclear icebreakers, is under EU sanctions. The icebreaker fleet is engaged in Russia's tasks related to maritime transportation along the Northern Sea Route, the shortest Arctic route between Europe and Asia. The Northern Sea Route has become a new strategic opportunity for unlocking and monetizing Russia's vast oil and gas reserves in the Arctic, providing a significant source of income for the Russian government. As a result of Russia's aggressive war against Ukraine and further Western sanctions, which affected the export of oil and gas from Europe to Asia, the Russian nuclear icebreaker fleet plays a crucial role in Russia's Arctic hydrocarbon strategy. Additionally, EU sanctions list includes JSC Concern NPO Aurora, a leading company in Russia's naval defense sector. JSC Aurora holds a license from Russia's Ministry of Industry and Trade for the development of weapons and military equipment, as well as a license from Rosatom for "work on the use of nuclear energy for defense purposes, including the development of nuclear weapons and military nuclear power plants." The company is best known for its activities in the development, production, and supply of automated control systems for surface ships and submarines of the Russian Navy.[201]

Reference: In 2020, about 20% of the uranium needed by Euroatom member states came from Russia and 19% from Kazakhstan. Rosatom covers approximately 26% of the uranium enrichment services within the EU. Companies of the Rosatom group export enriched uranium products to European countries such as France, Germany, Spain, the United Kingdom, Belgium, Sweden, Finland, Switzerland, and the Czech Republic. In 2021, Rosatom supplied fuel for 21 nuclear reactors in the EU. Bulgaria, Hungary, Slovakia, and the Czech Republic are 100% dependent on fuel supplies from Rosatom, while Finland relies on Rosatom for approximately 35%.[202]

Overall, the sanctions imposed by Western partners are not comprehensive; they target only specific companies under Rosatom's control. However, the diversified structure of Rosatom allows for efficient replacement of one company with another.

[200] European Commission. Analysis of ROSATOM activities and/or ROSATOM ties with the EU. https://data.europa.eu/data/datasets/analysederrosatomaktivittenbzwrosatomverflechtungenmitdereu?locale=en

[201] Official Journal of the European Union. https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=OJ:L:2023:059I:FULL

[202] European Commission. Analysis of ROSATOM activities and/or ROSATOM ties with the EU. https://data.europa.eu/data/datasets/analysederrosatomaktivittenbzwrosatomverflechtungenmitdereu?locale=en

Recognizing the threat posed by Russia in the nuclear energy sector, in April 2023, five G-7 countries, including the United Kingdom, Canada, France, Japan, and the USA, publicly[203] emphasized the need to develop cooperation in the nuclear energy sphere to reduce Russia's presence and influence: the desire to "*completely squeeze Putin out of the nuclear* energy market." Moreover, on June 8, 2023, the USA and the United Kingdom signed a joint Atlantic Declaration, which envisages the launch of a new economic partnership between these countries aimed at *"supporting the critically important clean energy sector, our ambitions for achieving carbon neutrality, and preventing Russia from entering the global market of civilian nuclear energy."*[204] Such a clear position indicates readiness for action and the necessity of taking comprehensive measures by the partner countries.

Conclusions:

I. Threats to national, regional, and international security from the directed activities of Rosatom should be considered in five dimensions.

Firstly, Rosatom is under full and decisive control of the authoritarian Russian government, making it their instrument. This is evident from both the corporate management structure and its activities.

Secondly, Rosatom operates as a tool for Russian influence in almost all regions of the world. The company enables the Kremlin to use international cooperation in the nuclear energy sector to influence governments and populations of countries where it has nuclear facilities or sells fuel, services reactors, transports nuclear waste, upgrades, or builds new nuclear power plants. This makes other countries vulnerable to Russian political influence. If necessary and under certain conditions, Rosatom's influence on other countries can be "weaponized" by the political leadership of the Russian Federation, as demonstrated in the situation with natural gas supplies to European countries.

Thirdly, Rosatom's foreign activities generate significant revenues for the Russian federal budget, which allows the Kremlin to continue its external and internal policies, including the war with Ukraine. Governments considering cooperation with Rosatom should be aware that providing Russian credit for the construction and modernization of nuclear power plants (at a low interest rate for a long period) enables Russia to secure stable financial inflows and exert political influence for at least the repayment period. Furthermore, credit agreements are usually reinforced with contracts for the supply of fuel for the

[203] GOV.UK. Press release. New nuclear fuel agreement alongside G7 seeks to isolate Putin's Russia (16 of April 2023). https://www.gov.uk/government/news/new-nuclear-fuel-agreement-alongside-g7-seeks-to-isolate-putins-russia?fbclid=IwAR0x5dBNpnOGtWP52DbEcAoenuBmQNeS_Y60ro3FAyVZ_RavNI4A-aeHadY

[204] GOV. UK. The Atlantic Declaration. https://www.gov.uk/government/publications/the-atlantic-declaration/the-atlantic-declaration

"entire life cycle of the nuclear power plant,"[205] which spans at least 60 years[206][207]. Consequently, apart from building nuclear power plants of "Russian design," Russia gains long-term political influence and leverage over other countries.

Fourthly, Rosatom's activities are non-transparent, involving a complex network of subordinate and associated entities, some of which operate in countries with weak anti-money laundering systems. [208] This indicates the potential for generating significant illicit profits through corruption, tax evasion, and an elevated risk of money laundering. Laundered funds may be used to achieve political objectives, as mentioned earlier. This dimension of Rosatom's activities also poses challenges for practical implementation of restrictive measures against it.

Fifthly, the presence of Rosatom and its related structures in different countries of the world provides favorable opportunities for its use by Russian intelligence agencies to gather scientific and technical intelligence in the field of nuclear energy and beyond.

II. The thesis about the need to minimize dependence on "Russian atoms" is axiomatic. Considering Rosatom's significant role in the global nuclear energy system, the nature, and geography of its activities, achieving this goal will be challenging but possible, given that a substantial portion of potential uranium conversion and enrichment capacities is surplus.

To reduce security threats from Russia, governments of democratic countries worldwide need to coordinate their efforts in decreasing Russia's capacity to use Rosatom for illegitimate purposes and actions that undermine the rules-based world order.

With this in mind, it would be prudent to develop and apply coordinated approaches to implementing restrictive measures of a political, regulatory, economic, and financial nature against Rosatom and its associated entities, both legal and physical. These measures should consider all aspects of nuclear safety, depriving Russia of the ability to leverage nuclear energy for advancing its interests.

Restrictive measures with comprehensive approaches, should address specific activities of Rosatom and its related entities in different countries, covering all stages of the nuclear fuel cycle. In particular, such measures should apply to raw material extraction, circulation, transportation, processing, construction, and maintenance of NPPs, etc. Ukraine can demonstrate a model of using alternatives to Russian nuclear fuel and apply sectoral sanctions. As the President of Ukraine put into effect the decision of the National

[205] Rosenenergoatom. Construction of NPPs abroad. https://www.rosenergoatom.ru/stations_projects/perspektivy-sooruzheniya-rossiyskikh-aes-za-rubezhom/
[206] Neftegaz.ru. Head of Rosatom in Bangladesh met with the country's Prime Minister H. Vazed (March 18, 2020). https://neftegaz.ru/news/nuclear/536883-glava-rosatom-v-bangladesh-vstretilsya-s-premer-ministrom-strany-kh-vazed/
[207] Strana Rosatom. "Rosatom" is aiming for records (December 18, 2017). https://strana-rosatom.ru/2017/12/18/rosatom-poshel-na-rekordy/
[208] Detector media. "Smart power" against hybrid threats (September 29, 2017). https://ms.detector.media/manipulyatsii/post/19733/2017-09-29-rozumna-syla-proty-gibrydnykh-zagroz/

Security and Defense Council of Ukraine to impose economic sanctions against the corporation, Rosatom and 199 companies that are part of this corporation[209].

An important element of countering the influence of the Russian Federation, including through Rosatom and its representations, is the implementation of a comprehensive **information policy** on the consequences of cooperation with Russia, especially for Asian, African, and Latin American countries, which Russia actively targets. For countries that have new-generation reactors but still continue to purchase fuel from Russia, it is also advisable to provide information about the importance of transitioning to fuel from other companies and encourage cooperation with them.

The unity of the international community in countering the influence and dependence on Russia in the field of nuclear energy will deprive representatives of Russia of the opportunity and reason to declare: "*Not only within 10 years will there be nuclear power facilities created here, but also for many decades, without any exaggeration - up to 100 years, the state corporation Rosatom will be present as a monopoly or majority owner of the nuclear power plant*"[210] [CEO of Rosatom Oleksii Likhachev on the construction of the Akkuyu NPP in Turkey].

[209] Telegram channel of the Security Service of Ukraine. At the initiative of the Security Service of Ukraine, sanctions have been imposed against 200 Russian companies that are trying to "seize" the Zaporizhzhia NPP in Ukraine. https://t.me/SBUkr/6966
[210] TRT NARUSSKOM. Rosatom intends to stay in Turkey for decades (July 21, 2022). https://www.trtrussian.com/tehnologii/rosatom-nameren-ostatsya-v-turcii-na-desyatiletiya-9611930

Country	Rosatom's activities in other countries							
	Fuel supply	**Construction of nuclear power plants (at the expense of the country)**	**Construction or modernization of nuclear power plants financed by the Russian Federation (including a loan)**	**Presence (offices, centers)**	**Registered companies of Rosatom in other countries**	**Contracts unrelated to the construction or maintenance of NPPs**	**Pre-contractual relations (memorandums of cooperation, joint statements)**	**Uranium mining**
Armenia	+		+	+				
Bangladesh			+					
Belarus			+	+				
Bolivia						+		
Brazil	+			+			+	
Bulgaria	+							
China		+		+				
Czech Republic	+				+			
Ethiopia							+	
Egypt			+					
Finland	+				+			
France				+		+		
Hungary	+		+	+	+			
India			+	+				
Iran			+					
Japan				+				
Kazakhstan				+	+		+	+
Kyrgyzstan				+			+	
Mexico							+	
Myanmar							+	
Namibia								+
Nicaragua							+	
Nigeria							+	
Republic of South Africa				+				

Saudi Arabia							+	
Singapore				+				
Slovakia	+							
Tajikistan					+			
Tanzania					+			+
Turkey			+		+			
UAE				+			+	
Ukraine	+							
Uzbekistan				+			+	