

ROSATOM NEWS



Cooperation on Earth and in Space

Rosatom will build four new power units in China. The Russian and Chinese parties have signed a record package of agreements on civil nuclear cooperation in the presence of Russian President Vladimir Putin and Chinese President Xi Jinping.

The agreements on civil nuclear cooperation became the largest set of documents ever signed by Russia and China. They provide for the implementation of several high-tech

projects, unparalleled in the global nuclear industry.

Firstly, the parties will jointly construct Tianwan NPP Units 7 and 8. Secondly, they will continue cooperation on a new site under a freshly signed agreement for the construction of Xudabao NPP Units 3 and 4 in the Liaoning province. Both plants will be equipped with VVER-1200 reactors. Funded by China, the Xudabao project opens up the possibilities for building more Russian-designed power units in the future.

Rosatom will design the nuclear island and supply the core equipment for the units at Tianwan and Xudabao. The start-up of



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Tianwan NPP Unit 7 is scheduled for 2026, followed by Tianwan NPP Unit 8 in 2027, and both of Xudabao NPP's units in 2028.

Thirdly, Russia and China will team up to construct the CFR-600 pilot fast breeder reactor. Having wide experience in creating and operating fast reactors, Russia will provide the CFR600 project with components and fuel, consulting and other services. Fourthly, Rosatom will supply a set of radioisotope heater units to be used in manufacturing radioisotope generators for China's moon exploration mission.

“We have signed seven agreements, which propel the Chinese-Russian nuclear cooperation to a new level,” said Rosatom Director General Alexey Likhachev. “Over the course of our long-standing cooperation with China's Atomic Energy Authority, National Energy Administration, and the China National Nuclear Corporation (CNNC), we developed an unprecedented level of trust. At Tianwan, the Russian and Chinese parties are jointly engaged in design and construction. We continue building state-of-the-art Generation III+ reactors and have ambitious plans for further cooperation which does not confine to high-power nuclear stations. Specifically, I would like to mention the fast breeder reactor project. It is based on Russia's know-how, and we are very selective in choosing countries to work with in this field. We have agreed with our partners that Russia will supply almost all of the core equipment for the reactor island. I dare say, our cooperation in nuclear has become uniquely close.” 



New Prospects

Russia and France are expanding their cooperation. Rosatom companies signed new agreements with French partners, bringing the total volume of all existing contracts with the country to USD7 billion.

Rosatom and the French Atomic Energy and Alternative Energies Commission (CEA) signed a strategic agreement at the St. Petersburg International Economic Forum in the presence of Russia's President Vladimir Putin and France's Emmanuel Macron. Both parties intend to step up cooperation in such areas as energy efficiency and renewable power sources, energy storage systems, fast breeder reactors, nuclear equipment engineering and supplies, nuclear fuel, spent nuclear fuel management technologies and use of reclaimed materials. Rosatom and CEA also plan to deliver joint industrial projects in third countries. The agreement also provides for nuclear student exchange and establishment of new contacts between R&D centers.

As part of the business program at SPIEF 2018, TENEX and EDF concluded a long-term contract for regenerated uranium

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reprocessing, providing EDF with opportunities to enhance its financial performance, preserve natural resources and diversify the sources of supply.

Turbine Technology AAEM (AAEM LLC, a joint venture of AtomEnergMash and General Electric) agreed with GE Power on the general delivery terms for auxiliary systems to be installed in the turbine islands of two new power units at Hungary's Paks II NPP.

Rusatom Automated Control Systems (RASU) and Framatome signed a memorandum on cooperation on the global market. The document provides for joint participation in the construction of VVER and EPR-based power plants, including maintenance, modernization, staff training, development of nuclear infrastructure, and assistance in certification of Russian-designed equipment in line with European and international standards. The parties will also consider the use of Framatome-designed automated control systems in Rosatom's foreign projects and production of their components at Rosatom production sites.

RASU also concluded a cooperation agreement with Schneider Electric, the world's power management leader, with a view to improve safety, reliability, cost efficiency and competitiveness of the electric equipment and power distribution systems at nuclear plants.

Rusatom International Network and the French Nuclear Industry Association (GIIN) will work together in several fields, including decommissioning nuclear plants, maintenance of Russian- and French-designed nuclear power units, supplies of nuclear equipment and spare parts, and staff training. The relevant agreement

also provides for the parties to cooperate in developing nuclear research reactors, particularly the International Thermonuclear Experimental Reactor (ITER). 



Transportation Goes Digital

ASE Group of Companies (Rosatom's engineering division) and Moscow State University of Railway Engineering (MIIT) signed an agreement for cooperation in designing, construction and operation of transportation infrastructure, creation of high-speed transit systems, and development of software to digitally transform the transportation industry.

At present, MIIT is working to provide the scientific basis for creating a transportation system under the Digital Economy program. The university also acts as an integrator of research efforts aimed at developing and applying digital technologies in the transportation industry.

In its turn, ASE Group of Companies acts as a general contractor within the framework of

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the Digital Economy program. The company is developing and implementing its own digital platform based on Multi-D technology.

Working with MIIT is an opportunity for ASE to exchange experience. The company believes that such cooperation will help Russia secure a leading role in engineering and construction of a wide range of complex facilities.

The experts from ASE and MIIT are going to analyze and structure the extensive data on transit system operations, enhance the efficiency of building information modeling, and improve the use of virtual and augmented reality tools. [NL](#)



Real Benefits

Rosatom experts spoke about the merits of building a nuclear center in Mongolia. Over sixty Russian and Mongolian experts, including representatives of Rosatom

and Mongolia's Nuclear Energy Commission, researchers and scientists, took part in a seminar held in Ulaanbaatar.

Dmitry Vysotsky, Director for Nuclear Research Reactors at Rusatom Overseas, described the benefits of constructing a nuclear science and technology center. “The Centre has great importance for the scientific cooperation of our countries. The creation of the CSNT in Mongolia will also create additional jobs. Another advantage of the project is the possibility of producing isotopes for medical and industrial purposes. The construction of the centre will provide a new level of mining technology. In the long term, a network of radiation centres can be created, this will allow to preserve food products longer”, — he said.

Secretary of the Nuclear Energy Commission Gun-Aajav Manlaijav noted the importance of the CSNT project for Mongolia: “First of all, the establishment of the centre will contribute to the development of Mongolian nuclear scientists research conditions. Secondly, this will be an important step on the way to the development of nuclear energy personnel.” Mongolia also expects that nuclear centers will help expand the use of nuclear technologies in the food industry, agriculture, healthcare, and isotope production.

According to the memorandum on cooperation in constructing nuclear centers (the document was signed in February 2018 — RN), Russia and Mongolia are to agree on the preliminary requirements and specifications for the facilities to be built, and develop a road map for the project. [NL](#)



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Microwave Energy

Rosatom developed an SHF-based method for extracting rare-earth and rare metals.

The innovative technology has been developed by the Russian Research Institute of Chemical Technology and is yet to be tested at the Kovdor Mining Plant. It uses the energy of super high frequencies (SHF) to reduce the mechanical strength of metal-bearing material, reduce the power consumption during grinding, and prepare the minerals for hydrometallurgy. “When crushed ore is exposed to high-frequency electromagnetic radiation, the grinding speed goes up, the particle size of ground material is reduced, and, more importantly, the capacity of grinding machines grows by 10%,” explained Vasily Koltsov, Director of the Department for Industrial Waste Processing at the Russian Research Institute of Chemical Technology.

The SHF energy also adds to the reactivity of rare and rare-earth metal ores and

For reference:

The Russian Research Institute of Chemical Technology is involved in research and development of eco-friendly technologies for complex processing of uranium, polymetallic and rare ores, and trace and radioactive metals to produce pure compounds used in nuclear fuel cycle. The Institute also creates new technologies for spent nuclear fuel and radioactive waste management. The Istok Research and Production Corporation specializes in development and series production of cutting-edge SHF electronics for telecommunications and radio detection.

concentrates, allowing for higher recovery during leaching as compared to the existing technologies.

The technique is intended for extracting rare or rare-earth metals from minerals and waste, and will be implemented in the framework of a special R&D program.

The Russian Research Institute of Chemical Technology (part of Rosatom’s research

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division) and the Istok Research and Production Corporation (a part of Rostec) signed an agreement for research to introduce the innovative rare and rare-earth metal extraction technique at the Kovdor Mining Plant. According to the agreement, the Institute will provide R&D support for the commercial production of baddeleyite concentrate from off-spec products. ^{NL}



Financing Innovations

In June, Rosatom launched a venture fund to develop new business directions. Key investment areas will include artificial intelligence and other digital solutions in industry and service applications, renewables and smart energy, 3D printing and new materials, development systems for smart and energy efficient cities, Russia’s nuclear state corporation reported.

Rosatom established its venture fund in the form of an investment partnership agreement. The nuclear corporation is ready to invest up to RUB3 billion (USD47.4 million). The fund format — investment partnership — has been selected by the state-owned corporation to attract and interest other market investors increasing the volume of investments by 2–3 times.

The fund intends to invest in early and seed-stage companies, as well as companies that have entered the scaling stage. According to the state nuclear corporation, the key parameters in selecting investment objects are: fast growth prospects, potential for global technological expansion and synergy with main areas of development of Rosatom.

“The fund is one of the tools of the system of innovation development and control being created in Rosatom and operates in close synergy with other divisions. The most important task of the fund is to make the path for start-ups to Russian and world market more realistic and fast with the use of Rosatom’s capabilities,” — First Deputy Director General and Director for Development and International Business of Rosatom Kirill Komarov explained.

General Director of “Orbita Capital Partners” Evgeniy Kuznetsov, ex-head of “Russian Venture Company”, will head the fund’s management company. According to him, the fund’s important mission is to create an effective mechanism for synthesizing governmental and corporate development instruments with Russia’s startup environment. ^{NL}

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Framework for Cooperation with Rwanda

Rosatom and the Ministry of Infrastructure of the Republic of Rwanda signed a Memorandum of Understanding to set up the framework for cooperation in the field of peaceful uses of atomic energy.

The document lays the foundation for partnership in several areas, including the development of nuclear infrastructure in the Republic of Rwanda, the development of programs aimed at raising awareness of nuclear technologies and their applications, the use of radioisotopes and radiation

technologies in manufacturing, agriculture and healthcare.

The memorandum was signed by Rosatom Deputy Director General — Director of International Affairs Department Nikolay Spasskiy, and Ambassador Extraordinary and Plenipotentiary of the Republic of Rwanda to the Russian Federation Jeanne d'Arc Mujawamariya.

The parties agreed to create working groups to work out particular projects for cooperation. "Preparation of the framework Intergovernmental Agreement between Russia and Rwanda is expected to be the next step," Rosatom states. [NL](#)

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Economy Gains Weight in Public Acceptance

Current trends show a certain shift in the nuclear energy public acceptance agenda. Though safety remains one of the cornerstone issues, local communities and governments begin to focus on the economic and ecological benefits of NPP projects. A round table on nuclear public acceptance, which was held during Atomexpo-2018, demonstrated that quite explicitly. Here are the highlights of the ideas voiced at the event.

KIRILL KOMAROV

First Deputy Director General for Corporate Development and International Business, ROSATOM

Today it is impossible to separate business objectives from social issues. We believe

that to gain public acceptance we need to build effective partnerships. We are already working with the World Nuclear Association in this realm — for example, at the beginning of this year Rosatom took part in a two-day “Indonesia spotlight” event, where we talked about the advantages of nuclear power for the entire national infrastructure of Indonesia and elaborated on the communication work that needs to be done. Public acceptance in Indonesia is the last missing element required to start the nuclear power program development in this country.

To gain public acceptance, first of all, you should be as open as possible. That is what we are doing in Rosatom. We established 23 information centers in Russia and in foreign countries. Every one of our big projects, like the construction of a nuclear power plant, starts with the establishment of an information center, because first of all, that’s what people need — open and transparent information. Otherwise, they begin to experience doubts and spread rumors. And the best way to address all these fears is to provide people with comprehensive



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information, which will help them find answers to all the questions they have.

In Russia we have a good level of support for nuclear power — over 70%. It gives us the opportunity to develop the industry in our country. But the most interesting fact here is that the level of support in towns near nuclear facilities is more than 90%. It sounds strange, because it seems that the closer to a nuclear facility people live, the stronger their fears should be: they are very close, and if something happens, they are immediately affected. But in reality they are very strongly pro-nuclear, as they have a lot of information, coming from different independent sources: not only media and official statements, but also information from their neighbors or relatives working at the nuclear facility. So, when a fearful rumor starts circulating, people can ask a direct question: is everything “ok” or not? And they can get a direct answer. As for me, this is real evidence of the correlation: the more open we are, the higher level of public support we have.

JEREMY GORDON

*Advisor of the WNA on the Programme
“Harmony”*

There are two fundamental things that you need before you become a successful nuclear operator. First — you have to be safe. If you are not safe, you should be shut down. Second — public acceptance. If you don't have it, you cannot be successful for long. You may build and operate your plant for a while, but it won't be very long before some problem comes out: policy may change, you can't get your license extended, you can't get new build. So, you really need to focus on getting these two.

You have to create an effective safety paradigm focusing on genuine public well-being, where the health, environmental and safety benefits of nuclear are better understood and valued compared to other energy sources. When there is a conversation about safety, there should be a pre-existing understanding of benefits that nuclear brings. They should be talked about as much as possible. We need to think what the issues stakeholders really care about. When our work affects those issues for the better, we have to get out and communicate that. It's not that difficult. We don't have to pretend, as we really care about the same things.

MINNA FORSSTRÖM

*Hanhikivi 1 NPP Project Director
at Fennovoima*

We bring Fennovoima closer to people and continuously work on making it familiar especially in local communities. It is not only communication, it is engagement. Puhayoki (the community that is nearest to Hanhikivi-1 NPP construction site) is a small village with a population of around 3500 people. We've been present in this village since 2008, having a small office with doors open almost all the time. We are hosting discussions there — even with people who are against us. A lot of work has been done. Now 75% of Puhayoki inhabitants support the Hanhikivi-1 project.

We have engaged our own employees to promote the nuclear power plant project in regular conversations or on social media. The main idea is that we are the part of the solution to mitigate climate change. We have nothing against renewable sources, but we see nuclear as the essential core. I can say personally — this is one of the main drivers



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of why I am building the nuclear power plant: it's all against climate change.

ATTILA ASZÓDI

Government Commissioner in charge of the Paks II project

I think that when it comes to III+ generation reactors, the safety issue is not on the table any more. I made more than 100 public hearings and public consultations with a lot of people. When we started the whole campaign in 2014, I said that safety will be the key element of those consultations. But when we had presentations about the plant, it became clear that generation III+ reactor technology with its double-wall containment, with the core-catcher, with all the safety features, arose no safety questions from the public anymore. The most numerable questions that we heard during the consultations were not related to the plant, not related to the safety. I'm not saying that we do not need to know or to speak about safety, but that's not the main focus with generation III+ technology. People asked questions about the economic advantages of Paks-II nuclear power plant project. That was the main focus.

CRISTIAN VEGA

President, Argentine Youth Nuclear Generation

The decision developing countries make on their way to producing energy is not the same one facing developed countries. The latter can choose the kinds of energy sources

they are going to develop because they are rich. But this is not the case for developing countries. As an example I will take China. In the early 80-s, around 80% of its population lived in poverty. And right now, that number amounts to 20%. This is a remarkable, amazing result. Of course, they did it with a model that includes cheap energy. But the cheap energy released toxic particles into the atmosphere, and it is not only China's problem.

BASSET BUYUKAH

Director, Publicity & Advocacy, Kenya Nuclear Electricity Board

Kenya is looking at commissioning about four gigawatts of nuclear power by the mid 2030s. The main questions our people ask when we tell them about nuclear are:

- 1) How much is it going to cost? Is nuclear cost-effective compared to other energy sources?
- 2) How will we deal with the West?
- 3) Is nuclear safe?
- 4) What are nuclear energy benefits? How will nuclear affect energy tariffs?

It is proven that a geothermal and nuclear power plant will provide Kenya with best energy in terms of cost. Our government is aiming at building energy sources that can sustainably bring down the cost of energy in the country. ^{NL}

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Civil Construction for USD110 Million

Rosatom's Atomstroyexport rewarded the contract for civil construction works on the turbine island for Rooppur Nuclear Power Plant Unit 1 to Bangladesh company Max Infrastructure Ltd. The deal worth USD110 million was signed in Dhaka.

Max Infrastructure Ltd. is the joint venture of Bangladesh MAX Group (60%) and Indian Hindustan Construction Company Ltd. (40%).

MAX Group has experience in Rooppur nuclear power plant construction project. It has built the common facilities of the construction base at the site.

Hindustan Construction Company Ltd. has constructed 65% of India's installed nuclear power capacity, including two units

For reference:

The first nuclear power plant in Bangladesh — Rooppur NPP — is based on the same design that is used for Novovoronezh II in Russia and will have VVER-1200 reactors. This Generation III+ design is fully compliant with international safety standards. The Rooppur project follows the defense-in-depth concept that provides for multiple defense levels and mitigation of accidents and human error, thus securing environmental safety. The containment of Russian reactors is able to withstand severe natural disasters, which is extremely important for a country facing regular hurricanes and floods. The construction of Unit 1 began in November 2017.

of Kudankulam NPP with Russian-designed VVER-1000 reactors. Since India is not a member of Nuclear Suppliers Group, Indian companies may only be involved in the construction of non-nuclear facilities related to the NPP overseas. [NL](#)



BANGLADESH



New Railway to Rooppur

The Bangladesh Government made the decision to build a new railway line to the Rooppur nuclear power plant by 2020.

The project entails laying nine kilometers of new rails and modernizing 17,5 kilometers of existing railway. The modernization envisages converting single-way railway to two-way railway. The signaling system

will also be renovated. The total cost of the project is estimated as USD40.37 million. The sum is approved by the Executive Committee of the National Economic Council (ECNEC).

“The railway line will facilitate faster and efficient transportation of goods and machinery to and from the Rooppur NPP site,” Secretary of the Science and Technology Ministry Anwar Hossain explained. [NL](#)

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