

THE RUSSIAN ATOMIC STATE AGENCY'S PROJECTION IN EASTERN AND SOUTH EASTERN EUROPE: FINDING NEW MARKETS

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The development and application of nuclear energy in Russia dates back to the second post-war period. Following the first nuclear experimental explosion by the Soviet Union, the use of nuclear fission for generating energy then began, progressively, to be used. In 1954 the first reactors were constructed and by 1963 they were functioning as energy suppliers. However the Russian nuclear industry came to a virtual stop with the Chernobyl catastrophe and the fall of Soviet Union. The sector's recovery arrived at the end of the twentieth century, with the resumption of exports in nuclear know-how and technology, leading to a renewed phase in the history of the sector in the country. In the sixty years since starting its nuclear program, Russia has developed a total of 32 nuclear reactors, in addition to the nuclear weapons and warheads (officially counted in thousands). The Federal Atomic Energy Agency (Rosatom) has been charged with the mission of streamlining the activities in the

nuclear energy field and endorsing the expansion of Russian's civil nuclear capacity at home and abroad. Rosatom additionally cooperates with Russian Federation's public institutions (among which Ministry of Industry, Energy and Economic Development and Trade) with the goal of increasing the technological and productive strength of Russian nuclear sector. Its action is, on paper, independent from the influences of political power, facilitating the emergence of long-term strategies in the field of nuclear energy regardless of political changes. Nevertheless, it seems that the latest achievements of Rosatom are closely linked to the will of the Putin-Medvedev executive; a synergy that has worked well for the progression of nuclear programs at home and abroad.

In order to enhance the energy amount produced from already functioning reactors, there are ten more units under construction within the existing sites, which will be operating over the next five to ten years; a number of ongoing projects for the modernization of oldest plants are also being undertaken. The energy produced in this manner is able to supply 16% of the whole electric power demand of the nation. The amount of power supplied with nuclear energy is far less than what would be possible with more advanced technologies both in the production and the supply operational phases. In fact, because of the inefficiency of the Russian plants and electric grid, the nuclear energy output is below the average obtained by the industrialized countries such as United States and France. To overcome this difficulty, a plan has been promoted by the authorities to upgrade old reactors (through lifetime extension of some reactors built in the 1960s) and modernize the electric grid (through an agreement with Siemens worth 12 billion euro) by 2013.

More than half of the production deriving from outdated reactors of the present total nuclear capacity will be dismantled in the next twenty years. This will be replaced with new plants constructed to achieve the desired target of nearly doubling the power

output by 2030. If this estimate will be reached, the quantity of electricity generated by nuclear plants in 2030 will reach 25% of the total national demand (taking in consideration the forecasted annual 2,2% growth of power requirement in the next years). As we can clearly see Russia is investing greatly in nuclear energy, further strengthening one of its traditionally more developed economic sectors. One of the main reasons behind this program is the replacement of natural gas with nuclear power to satisfy, as much as possible, the national need. In fact, the profit made by Gazprom (the state gas company) by selling gas abroad (mainly to European Union and China) is far higher than what is earned by producing electrical power for home consumption. For this reason the Russian Federation is trying to assign gas reserves to export and to compensate for it by starting brand new nuclear reactors and upgrading some of the old ones.

The huge, and expensive, Russian nuclear program planned over the next twenty years inscribes itself inside a broader tendency towards the modernization which got underway in 2010. According to the Kremlin, the country's economy should follow a path of innovation and diversification aimed at overcoming the comparative backwardness of many Russian economic sectors and paving the way for a fully industrialized and technologically advanced society within 2020. While on one side the expansion of the nuclear energy sector is intended to boost other productive activities, on the other side it will absorb a great share of the investments made available by national and regional authorities in the next decades. This situation will imply a setback in the strategy of economic diversification. Moreover the sought-after effect will be modest, as demonstrated by the official figures, depicting a mere 25% of electric consumption obtained through the vast nuclear program twenty to thirty years from now. That being said, the investments allocated will certainly allow Rosatom to improve its building technology and engineering skills with the outcome of facilitating

its penetration inside foreign nuclear energy markets. The will to expand and deepen the commitment in nuclear energy production at home is tightly linked to Russia's rising profile as an exporter and supplier of plants, reactors, uranium, know-how and services to developing countries, plus a growing role as a partner in research and application of new nuclear technologies with already industrialized nations.

The collapse of the Soviet Union seemed to have definitively buried any Russian plan of exporting civil nuclear technology to other countries. At the end of the nineties some opportunities materialized for Moscow to sell technology and know-how to Iran, China and India. This renewed context evolved in the new century, added to the re-emergence of strong political leadership in Russia, and revived the Russian nuclear export industry. The experience accumulated during the intensive period of Soviet nuclear research, coupled with new public funds allocated to the sector at the beginning of the century, has pushed forward an assertive strategy to enter civil nuclear foreign markets. As more and more states around the world are looking for affordable ways to reduce the use of fossil fuel on a large scale, the global request for reactors has dramatically increased, giving to Russia the opportunity to cover a significant part of this new demand. Moreover the international forums organized by the biggest nuclear powers have turned the attention to a "nuclear renaissance" and consequently stimulating the spreading of civil nuclear projects all around the world. In this framework the elements mentioned above have conjured up to the success of the new nuclear export policy of Moscow.

The strength of the export strategy carried on by Russia and particularly by Rosatom resides in the full (from beginning to end) nuclear industrial cycle on which they can rely. In fact the limit of many international competitors is the lacking of some of the features essential to complete the production of nuclear energy from beginning (uranium mining) to end (storage and keeping of radioactive waste). The main stages

of nuclear export industry are the following five: uranium possession; the ability to extract and/or transport it to nuclear facilities; the appropriate technology to work and enrich uranium; the technical skills to build and operate a nuclear plant; and the storage of nuclear waste at the end of the cycle. Moscow is active and is expanding its reach in everyone of these fields, making its position extremely favourable in the civil nuclear world market.

In the Russian territory there are significant uranium deposits, which represent approximately 10% of world reserves. In addition Moscow is participating in big exploration and exploitation ventures in Kazakhstan and Mongolia. The experience that Russian technicians have in extracting uranium means that they do not have to ask for the services of non-Russian mining companies, cutting costs and having the full material extracted at their disposal, to develop their own nuclear strategies freely. These circumstances give the country the productive weight needed not to depend from foreign sources of uranium for its domestic market and at the same time to transfer part of its output abroad to states without owned uranium mines. The quantity of uranium extracted in Russian mines is increasing from year to year (almost 30% in 2008 and 2009) thanks to investments made in explorations of new mining sites, foreshadowing a fast rising capacity in uranium exports.

Russia is able to enrich the uranium it extracts and has the possibility to transport it wherever necessary. The enrichment segment of the nuclear cycle is essential not only with reference to the autonomous running of reactors but also for establishing a high added-value industry too. Many countries which are planning to build reactors haven't got the ability to enrich uranium and the Russian enrichment sites can reasonably cover a good part of their demand, which can account for hundreds of millions of euro every year. Russia's Authorities want to institute a international nuclear fuel bank on its territory, in order to provide the mounting civil nuclear

demand with enriched uranium with the supervision of United Nations IAEA (International Atomic Energy Agency). If this ambitious project will succeed, Russia might become, in the medium-term, the leading supplier of enriched uranium in the world.

The next stage, the building and management of nuclear plants, is a key sector for Russia. In fact the national project for nuclear energy started in 2010 and mentioned above, will provide Rosatom the competitiveness required for winning contracts to construct and operate reactors abroad. In this way Rosatom will guarantee itself some the most expensive infrastructural contracts now available and in some cases will obtain the control, through management, over the nuclear plants that it will build in a foreign country. The advantage for Rosatom, and thus for Moscow, will be both financial and geopolitical.

At the end of the cycle is the last phase of nuclear power production: the storage of radioactive waste, which is very expensive and environmentally risky. Given these elements, the possibility to offer storage services of extremely dangerous and radioactive materials will constitute a decisive advantage in nuclear world market and particularly in Western, Eastern and Balkan Europe. Apart from the massive financial entries that would be brought by the transport and disposal of foreign waste on Russian territory, this characteristic could enable Rosatom to offer a complete service to the states interested in having civil nuclear energy for power generation in the next ten-twenty years. This is especially true because of the vast uninhabited land on which Russia can rely on to store up the waste coming from abroad. The uniqueness of managing the complete nuclear industrial cycle (from extraction of uranium to storage of waste) that Russia can offer to potential purchaser nations, will be used to win contracts worldwide as well as to project the international commercial influence of Moscow.

The contemporaneous existence in the Russian Federation of all the factors which are crucial for the nuclear cycle, is a feature that Moscow can exploit to promote its exports in this sector. From 2006 onward, Rosatom has begun to assert its position on the world nuclear market entering both the single product markets (supply of nuclear fuel; construction of reactors; etc.) and the whole cycle with regard to countries without any nuclear facility or experience. The uranium mining operations where Russia's state agencies and private partners are involved outside national borders are: Kazakhstan, Mongolia, Canada and South Africa. The nuclear fuel enriched in Russia (completely or partially) is sold nowadays to Ukraine, Japan, Swiss, South Africa, Mexico and the United States; the Middle East and Eastern Europe are two regions where the Russian exports of enriched uranium for various national reactors are ready to spread. The cash inflow for Russia's agencies derived from low or high enriched fuel sale amounted to almost five billion dollars last year and it is predicted to grow in the next decade. With the majority of countries in Eastern and Balkan Europe trying to exploit nuclear energy to cope with their rising domestic consumption of electric power, Rosatom will have the chance to win a noteworthy slice of the tenders that will be opened in the next months and years. This will be true for nuclear fuel supply as well as for the construction and maintenance of brand new reactors.

Apart from huge contracts signed with China and India, South-Eastern Europe stands as the main region where Rosatom is gaining nuclear market shares. Ukraine, Kazakhstan and Belorussia are long-time partners with whom Russia is deepening ties in the nuclear infrastructure and services markets while Turkey and Armenia are negotiating commercial partnerships for reactor building-supply-operate-storage solutions. An option that is also sought by other nations in the area which lack technical skills, raw materials or public opinion support, for finding a radioactive waste storage sites. Another attractive alternative is the build-supply-own-operate-storage

which would be gladly accepted by countries which, in addition to the above mentioned difficulties, suffer a shortage of funds. These manifold and all-inclusive commercial possibilities are likely to boost the role of Russia in nuclear world market, comprising Eastern Europe and the Balkans.

In Bulgaria, Russia is already building reactors at the Belene nuclear plant with the future opportunity to further expand into all other branches of the country's nuclear market (fuel, storage, safeguarding and maintenance etc.). This is an example of what could easily happen in other nations of the area in the forthcoming years. As far as concerns nuclear applied research, Moscow is seeking to become one of the main world powers and to turn into a reference point in the field for Eastern and Balkan Europe. Training of specialized personnel coming from other countries in: exploration of uranium fields, engineering and manufacture techniques of reactors, uranium treatment and enrichment and fuel transport systems, is becoming an important activity for Moscow, especially with the current opening of many states to nuclear energy. The research and training activities are also export oriented, representing an investment directed to the nations where the trained technicians will work, together with public relations-business actions carried on by special offices of Rosatom beside official embassies.

The expansion of different Russia's different nuclear export services will probably be a key factor in the country's global export strategy, adding great value to other main exports (natural gas, steel etc.). Anyway the spreading of nuclear plants in the region, resulting from the present success of Rosatom's commercial role, will imply a growing danger for the environment and international security. The storage of larger amounts of spent fuel will increase the risk of devastating contamination of water and soil, not to mention the fatal accidents likelihood which grows with the number of nuclear reactors functioning. Should it happen, the incalculable damages would last thousands

of years; a price not accounted for by the Russian export strategy. Nuclear proliferation could be another extremely risky problem, which is more probable in countries where the civil use of nuclear energy has already begun.

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