Nuclear Energy Gains Momentum in the Green World

The notable development of nuclear power came after the first oil shock in 1973 to reduce countries’ dependence on Middle Eastern oil. The current situation in Europe is similar: prices are rising. The share of electricity in consumption is also growing, further contributing to a diversification of energy sources and the development of renewable resources, especially considering the Climate Clock. However, the use of wind, for example, is gaining increasing disapproval in various parts of the world. Therefore, in many countries, a significant part of the population favors building new reactors.

After Chernobyl, the atomic sphere was long in oblivion until the 2000s, when the renaissance of the atom occurred. But then the Fukushima Daiichi nuclear disaster happened in 2011, swaying the public the other way around. Nuclear power was all but abandoned for an entire decade, and the era of building a “green world” began. However, climate warming and the objective difficulties encountered in recent years in implementing the so-called “green agenda” have reignited the world’s interest in nuclear power. This interest was primarily due to the gas crisis that erupted in Europe, caused by the European Commission’s insistence on moving away from long-term supply contracts and the creation of gas exchange trading, forbidding Russian gas pipelines to pump gas at total capacity even in the physical absence of an alternative gas supplier. In addition, the crisis was related to the EU’s attempt to make too rapid an artificial transition to wind and solar generation while abandoning backup energy capacity, primarily coal and nuclear power generation.

Against the backdrop of this crisis, China announced its intention to build 150 nuclear reactors by 2050, and French President Emmanuel Macron seized the moment to declare that the energy and environmental future is linked to nuclear power. He has also earmarked a billion euros for a small reactor program and is about to give the go-ahead
to construct six pressurized water reactors.

In October, a European report on future energy sources was published, and out of 6 scenarios, 5 indicated the use of nuclear energy. It is also the most cost-effective way to go about it, and there is a possibility that, despite resistance from many EU members, the European Commission will include nuclear power in the list of transition sources on the way to a green economy to ensure energy security, electricity supplies, following the goal of achieving carbon neutrality by 2050 declared by several politicians.

The energy crisis that suddenly erupted in Europe forced many to take a new look at nuclear power. While Germany and Belgium are flatly rejecting nuclear power plants, ten other European countries, led by France, have already begun to push for their retention, advocating the inclusion of nuclear power in the European Commission’s list of industries that help reduce environmental damage.

The same conclusions were reached by Ankara, which decided to bring the total number of nuclear power plants in Turkey to three after commissioning in 2023 the first unit at the Akkuyu Nuclear Power Plant currently under construction, and becoming one of the few countries with nuclear power. The second may appear near the Sinop and the third in Iğneada near Bulgaria. Ankara already has electricity exports to the EU in its sights.

In addition to Ankara, Bucharest also plans to host small nuclear reactors in its territory, but no longer Russian-made, like Turkey, but American-made. The upcoming deal was announced by Romanian President Klaus Iohannis and US Special Presidential Envoy for Climate John Kerry during the COP26 UN Climate Change Conference in Glasgow. By doing so, Romania could be the first to host new small modular nuclear reactors (SMRs) in Europe, following an agreement with the US company NuScale Power. Although the European Union has not yet approved the technology, Iohannis hopes that by 2028 the first power plant consisting of a cluster of six SMRs, which are much cheaper than conventional nuclear reactors, will be in operation and therefore best suited for emerging economies.

Britain has also joined the new wave of reactor fever: Rolls-Royce has raised £455 million ($617 million) to develop small nuclear reactors for the country, with half the cost being borne by the British government. The first small modular nuclear reactors could be available in the early 2030s, and according to Rolls-Royce estimates, London needs 16 such devices between 2030 and 2050 to replace aging nuclear plants.

The situation is similar in the United States. According to a report by researchers from Stanford University and the Massachusetts Institute of Technology, the lifetime of California’s Diablo Canyon nuclear power plant needs to be extended for the state to meet its climate goals. Today, this nuclear power plant generates about 8% of the state’s electricity and has a 15% share of carbon-free energy production. Postponing the plant closure until 2025 would reduce carbon emissions from power plants in California by more than 10% from 2017 levels. Scientists have calculated that if the nuclear power plant operates until 2045, it will save the state up to $21 billion. Closing this nuclear power plant was raised shortly after the Fukushima Daiichi nuclear disaster as the public in California was concerned about earthquakes, atomic waste, and the need to use water to cool the plants. The decision was based on the belief that wind and solar power could make up for the nuclear plant closures. Still, California has faced regular power outages over the past two years due to extreme heat. The accelerated transition to electric vehicles will likely only add problems to its power grid. In this regard, Steven Chu, a US secretary of energy under former President Barack Obama, now a Stanford physics professor, said: “To combat climate change in the best possible way, I think nuclear power... is something that we should really consider.”

The decisions by Britain and France to restart the construction of nuclear power plants certainly give Russia two powerful situational allies in the global debate on decarbonization, where the recognition or non-recognition of nuclear power as clean is one of the main topics.

However, the rapid development of nuclear power is fraught with several objective difficulties, as it will take at least 3-4 years to build a nuclear power unit. But it is not enough to build a nuclear power plant. One must provide it with nuclear fuel, which requires the growth of mining and processing of ore, an increase of productivity of uranium extraction combines, the construction of additional facilities for isotope separation (enrichment) and the formation of the fuel itself (which is now oxide pellets for power rods). According to experts, the world’s capacity built more than half a century ago was designed to provide fuel for about 190 operating NPPs. To supply the new European NPPs, and supply another 150 planned in China, nuclear fuel production capacities would have to be at least doubled.

In addition, the approval and construction of new nuclear power plants is a very long process, which is why they can edge out the share of RES, let alone gas, in Europe’s energy mix, only in the long term.
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