

Scientists identify the most effective scenario for nuclear energy in Russia through 2100

January 25 2021



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Currently, there is a rapid, fundamental transformation of energy systems with new technologies developing at an accelerated pace. It is clear that nuclear energy will be part of the global energy mix for decades to come, but its share and growth rate will depend on a number of factors, such as the speed of innovation in nuclear technology, energy

policies and funding mechanisms. Many scenarios based on specific targets predict the growth of the nuclear power sector, as it can solve the problem of energy supply over a long period.

Due to the large number of both objective and subjective factors, it is impossible to predict the direction of the future development of nuclear power over a long period. Scientists from State Scientific Centre of the Russian Federation—Leypunsky Institute for Physics and Power Engineering have published a study, "Multi-criteria analysis of the efficiency of scenarios for the development of the Russian nuclear industry in view of the uncertain prospects for the future," which considers several trajectories of nuclear [energy](#) development in Russia over the next 80 years. The research was published in the open-access journal *Nuclear Energy and Technology*.

Three types of scenarios were considered with the same power change. The first was a reference scenario with thermal neutron reactors. The other two were two-component, with the timely commissioning of fast reactors (base scenarios) and the delayed commissioning of fast reactors.

The results of multi-criteria analysis for all scenarios showed the greatest potential for a two-component system. Even the option with the delayed commissioning of fast reactors has a higher potential compared to the reference one-component system.

The inclusion of fast reactors in the nuclear power system is the best path of development, since the transition to a two-component system with fast thermal reactors will solve important problems, such as reducing the amount of spent nuclear fuel, conserving natural uranium, improving export potential, and reducing the amount of plutonium accumulation. And the timely commissioning of fast reactors is the most promising scenario for the development of [nuclear energy](#) in Russia.

More information: Anatoly V. Zrodnikov et al. Multi-criteria analysis of the efficiency of scenarios for the development of the Russian nuclear industry in view of the uncertain prospects for the future, *Nuclear Energy and Technology* (2020). [DOI: 10.3897/nucet.6.60557](https://doi.org/10.3897/nucet.6.60557)

Provided by National Research Nuclear University

Citation: Scientists identify the most effective scenario for nuclear energy in Russia through 2100 (2021, January 25) retrieved 20 March 2023 from <https://techxplore.com/news/2021-01-scientists-effective-scenario-nuclear-energy.html>

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