# WILL MOLDOVA BUILD NUCLEAR REACTORS OR NOT?

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"Moldova will build a modular nuclear reactor", "Moldova enters the nuclear era with a modular reactor", "Moldova intends to build a modular nuclear reactor" – this is how some local websites presented a post by the Minister of Energy following his visit to the USA.

The optimism of these headlines is exaggerated, and Moldova will not build any kind of nuclear reactor in the near future. On the other hand, the authorities' interest in this technology is real and enshrined in the Energy Strategy for 2050.

Inevitably, pro-Russian propaganda has also reacted. For example, KP headlined: "Moldova has set its sights on nuclear reactors: No money, no specialists, in a seismic zone — it's easier to teach a goat to play the accordion". The article was immediately picked up by the communists, while some socialists seemed undecided whether they wanted to criticize the idea as an unrealistic lie or as a real threat that we would become an experimental testing ground for Americans. These accusations are just as far from the truth as the more "optimistic" headlines.

For clarity, we will explain what the authorities actually said, what these modular reactors are, why this scenario is not realistic at present, and under what conditions it could become a real option.

**The Minister Did Not Announce the Construction of a Reactor**

First of all, it must be made clear that Energy Minister Dorin Junghietu did not write that Moldova would build such a reactor, nor even that such a possibility was being discussed.

Here is what the Minister actually wrote during his visit to Washington: "*I also had a meeting with representatives of the Nuclear Energy Institute, the discussions focusing on the perspectives of nuclear energy* ***in the region*** *and the opportunity to develop small modular nuclear reactor (SMR) projects. The institute's representatives expressed their readiness to contribute expertise to developing the Republic of Moldova's technical capacities in this field*".

Going from nuclear energy perspectives in the region and developing Moldova's technical capacities to "we will build a reactor" is quite a leap. Moldova currently has neither the financial resources nor the technical expertise—which is not acquired overnight—for such projects.

The story of small modular reactors in Moldova is not new: as far back as 2014, there were utopian headlines like "Moldova could have four small nuclear reactors and a liquefied gas terminal". Even ignoring such sci-fi titles, there is a real interest from the authorities in nuclear energy: it offers a permanent source of clean electricity that does not depend on weather conditions like renewable sources. Unlike traditional nuclear energy, small reactors, in theory, appear to be a potentially accessible technology even for the Republic of Moldova. They were included as a future option in the concept of the Energy Strategy for 2050.

## Why Are Small Modular Reactors (SMRs) Attractive?

Traditional nuclear power plants are large and expensive, and building new reactors is a headache even for developed countries like the UK. The Hinkley Point C plant was supposed to be operational in 2017 and cost £17 billion. Today, the forecast is that it will be ready in 2031, and the total cost, adjusted for inflation, will reach £46 billion. This is a well-known case, but not unique. According to a Boston University study, the construction of nuclear power plants is on average 102.5% more expensive, that is twice more than the initially planned budget, considerably above the 40% average for other energy infrastructure projects.

Even so, nuclear energy remains necessary both for the transition to zero-CO2 emissions and to satisfy the growing demand for stable energy for data centers used by the AI industry. In this context, modular reactors are one of the most *promising* technologies. Inspired by military reactors used to power submarines or icebreakers, modular reactors promise to be cheaper, easier to build, and simpler to install than traditional plants.

The basic idea is that these reactors are small, with power under 300MW, and are "prefabricated" by the manufacturer on an assembly line. They are then transported to the site of the new plant. They can be assembled at the factory or on-site, like a kind of nuclear IKEA. If necessary, new ready-made reactors can be added to the plant.

Economies of scale are the reason why these reactors would be cheaper: they are mass-produced and identical, meaning new plants don't have to be designed from scratch, and maintenance is simpler because it doesn't need to be customized. Essentially, money is saved on both design and maintenance. The technologies proposed for use inside the reactor are sometimes innovative as well, with the potential to further reduce operating costs.

Consequently, modular reactors have the potential to be accessible even to countries like Moldova, which lack a tradition of nuclear industry with the necessary expertise or the financial resources for large nuclear plants.

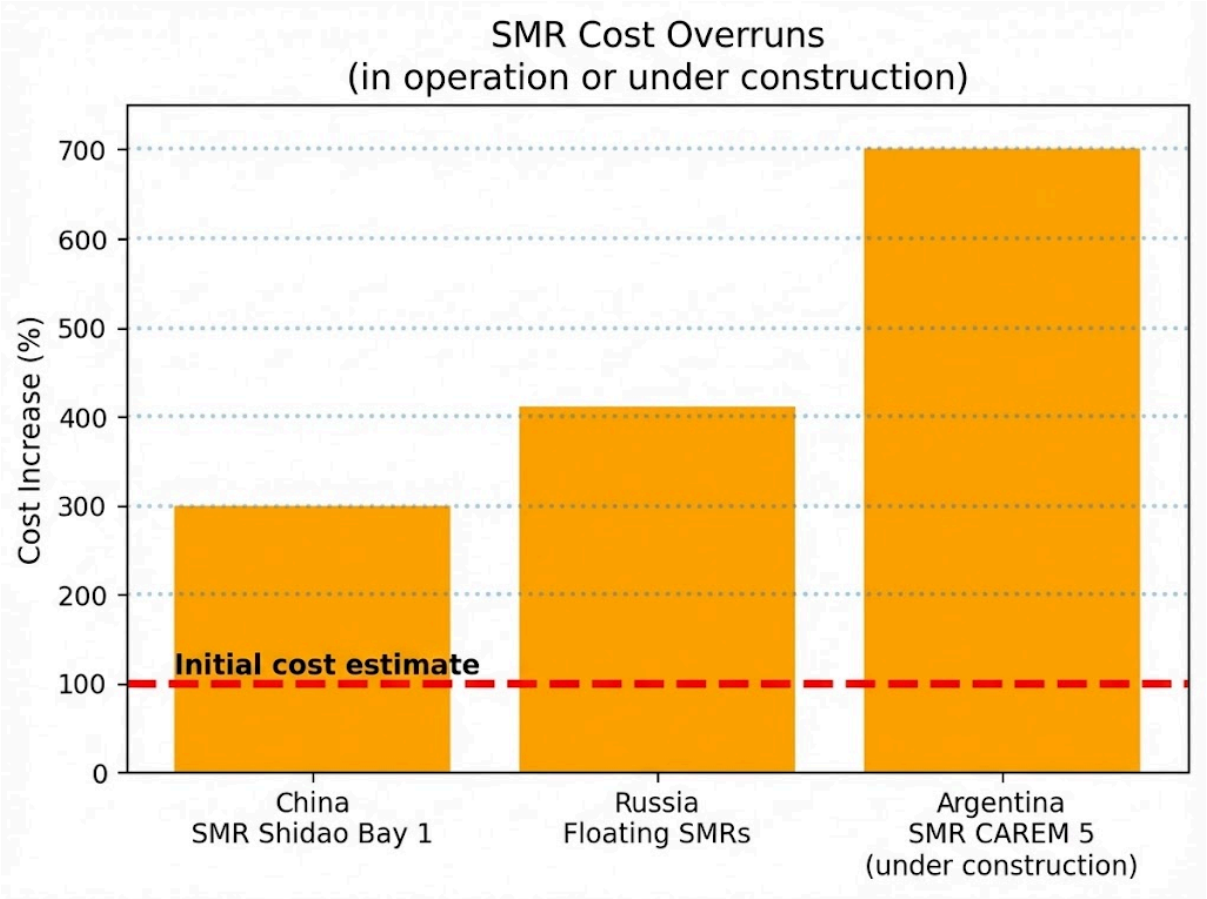
## What Is the Problem with Modular Reactors?

The number one problem is that they don’t really exist—at least the ones written about in the press. There are only two examples of modular reactors that actually function and deliver energy.

Russia has the *Akademik Lomonosov*, a floating plant with two small 35MW reactors, with a total electrical power of 70MW. Construction began in 2007, and the plant became fully operational in 2020. China has a plant with an electrical power of 210MW. Construction began in 2012, the plant became operational in 2021, and began commercial operation in 2023.

Otherwise, all the examples and projects discussed in the press for years are at best at the construction or design stage, but more often only at the conceptual stage. The theoretical

advantage of economies of scale for modular reactors refers to their large-scale production—to be cheap, they must come in large numbers off the assembly line. At the current stage, however, these reactors are still expensive experiments.




According to some estimates, for a modular reactor model to have the benefits of economies of scale, it must be produced and sold in volumes of at least 30-50 units, depending on the technology used. No current project is set to come close to such figures in the near future.

To reach these figures, the reactors that are built will have to prove they can deliver cheap energy to the grid, but even here there are question marks. In the US, one of the largest projects for building a modular reactor plant was terminated specifically for this reason. Initially, NuScale estimated the cost of a kilowatt-hour produced by its reactors at $58, but the price was later revised to $89. The contract was thus canceled before construction even began.

NuScale is also the company developing the modular nuclear plant project at Doicești, Romania. The plant is intended to have 6 modules of 77MW each, for a total electrical power of 462MW. Total costs are estimated between $2.97 billion and $6.47 billion, with a recent version around €4.9 billion (which would be 41% cheaper than the NuScale project in the US).

Construction has already been delayed by at least two years and is still in the design phase. A final investment decision is expected to be made in February 2026. Even in a positive scenario, the plant will not be ready before 2030.

**Moldova's Nuclear Hopes**

Whether nuclear reactors will become a real option for the Republic of Moldova depends heavily on the success of the project in Romania. Many "ifs" remain:

- If the investment is approved
- If the reactors are built more or less within the established timeline
- If construction costs do not significantly exceed initial estimates
- If, once the reactors are operational, their technical safety is confirmed without significant problems or complications
- If the price of the energy produced is competitive

Even then, the first reactors on the market (*first of a kind*) will be more expensive and, given Moldova's resources, we will likely have to wait for manufacturers to reach sufficiently high production numbers of optimized models (*next of a kind*) for prices to drop.

The issue of cost also concerns competition: renewables are cheap and represent a mature technology, tested on the market. Yes, energy from renewable sources depends on weather conditions, but in combination with storage batteries, which are also becoming increasingly affordable, this problem disappears.

For the next tender for the construction of wind farms in Moldova, which includes storage capacities, authorities have set a ceiling price of 1.44 lei/kWh, the equivalent of about $85.5/MWh. This is a price similar to the $89/MWh that NuScale estimated for their US project.

The difference is that for the wind farms in Moldova, we are talking about a ceiling price (a maximum) for a technology that already works. The NuScale price is an "optimistic target" price for an experimental technology and a plant whose construction likely would have taken and cost much more than planned.

Here is what the most optimistic scenario from Moldova's Energy Strategy Concept 2050 looks like: "*the development of the nuclear program will follow the three established stages: (i) the preparation and decision stage, (ii) the infrastructure development stage, and (iii) the construction and operation stage. This timeline indicates that a decision regarding the development of nuclear energy in the Republic of Moldova by the year 2030, if SMR technology evolves according to cost and safety expectations, would allow for the development of an SMR project by nearly 2040, and by 2050, such a reactor (or eventually multiple modules) would be operating maturely*".

Previously, authorities also examined another option: for Energocom to become a co-investitor in the Cernavodă Power Plant in Romania, which is in the process of expansion and refurbishment. At first glance, this is a more realistic scenario: we are talking about a functional plant, mature technology, and a limited role as a co-investitor without the technological, bureaucratic, and financial burden of launching a new project from scratch. In 2023, a memorandum was signed to this effect, but things do not seem to have moved since then. The idea of Moldova investing in the construction of a new reactor at Cernavodă was reiterated by new minister of energy Dorin Junghietu in 2025, but discussions were still at an

early stage. Of course, becoming an investor in Cernavodă would not guarantee direct energy deliveries to Moldova, but at least it would bring dividends in the state coffers.

**Conclusion**

Moldova will not have small modular reactors anytime soon. First, the press misinterpreted the information published by the Minister of Energy. The Minister did *not* state that Moldova was planning anything concrete regarding modular plants.

Secondly, these reactors do not yet exist as a mature technology on the market. They are promising on paper, but it is not yet clear if these promises will materialize.

Thirdly, even in the most optimistic scenario where modular reactors materialize as a viable and financially accessible technology for countries like the Republic of Moldova, design and construction would extend toward 2040-2050.

And last but not least: by then, we might not even need them. Wind and solar parks produce cheap, clean energy and can be built quickly and without risks. Storage batteries are also becoming cheaper. While other countries figure out if modular reactors are worth the effort, we cannot afford to sit idle. Moldova must continue to invest in domestic generation capacities: primarily renewables, but also natural gas plants.

If authorities and investors move quickly, it may be that small modular nuclear reactors become a question whose answer we will no longer care about.

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