

What is wrong with EXIM's plan to pay for Westinghouse reactors in Ukraine?

Building new reactors in Ukraine will be too costly, take too long and will distract from building a secure, sustainable energy system



In June 2022, Energoatom, the Ukrainian state energy company that operates the country's nuclear fleet, signed an agreement with the Westinghouse electric company to build 9 new nuclear reactors¹. The history of both companies casts doubts on the likely success of such a project. The Export-Import Bank of the United States (EXIM) and Ukrainian Ministry of Finance are expected to provide guarantees, passing the risks to taxpayers in both countries.

In an unlikely scenario where any unit will be completed by Westinghouse in Ukraine, it will bring unnecessary risks of an accident, decrease energy security by relying on a centralized energy grid and due to the need to import uranium, undermine efforts to

¹ [Energoatom and Westinghouse Reaffirm Clean Energy Partnership, Announce Expanded Cooperation on Westinghouse-supplied VVER Fuel and AP1000® Plants to be Built in Ukraine](#)

For more information

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Photo: Khmelnytsky NPP under construction. Author Olexi Pasyuk.



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build a resilient, decentralized energy system, and will increase energy costs for consumers. It is more likely, however, that the projects will face delays and price overruns while delaying Ukraine's energy system transition towards sustainable renewables.

Nuclear energy in Ukraine

Ukraine has 15 nuclear reactors in operation at four power plants. After working for 30 years, which was their designed operating lifetime, twelve of these reactors received approval for a lifetime extension in the last decade. The three other reactors were completed in the mid-90s (Zaporizhzhia 6) and 2004 (Khmelnitsky 2, Rivne 4).

In view of the country's stable electricity demand after a sharp decline in the 1990s, when Ukraine experienced economic crises following the Soviet Union's collapse, and troubles maintaining thermal power capacities, in 2021 nuclear provided well over 50 per cent of the country's electricity while constituting less than 30 per cent of installed capacities. Energoatom wishes to maintain its share in electricity production by building new units to replace the ageing fleet after 2030.

The EXIM Banks's guarantees

Energoatom's president Petro Kotin has claimed that the EXIM Bank is likely to finance 85 per cent of the project starting with the first reactor, while Ukraine will be required to finance the remaining 15 per cent. Mr. Kotin also expressed his hope of convincing EXIM to pay half of Ukraine's 15 per cent share.² He estimates each new unit to come at a cost around USD 5 billion.³

The EXIM loan would mean that the Ukrainian state will need to provide guarantees for the project. This means that public money will be put into projects that are unlikely to be completed and that are far away from renewables that have proven to be a cheaper and more secure base for the future decentralized (distributed) energy system. The track records of both Westinghouse and Energoatom make the potential EXIM investment especially risky.

Westinghouse's questionable current ability to build reactors

Westinghouse built the world's first commercial pressurized water reactor in Pennsylvania in 1957. While the US is the home of the biggest nuclear fleet in the world, there has been no interest in building reactors in the country since the late 1970s. In the early 2000s the United States tried to revive its nuclear industry. First, the Energy Policy Act of 2005 provided the industry with financial incentives. Next, in 2010 the Obama administration committed more than USD 8 billion of construction loans for the nuclear industry. In 2008, the US Energy Information Administration projected almost 17 gigawatts of new nuclear power reactors by 2030,

² [Energoatom is preparing a documentary basis for cooperation with the United States on the construction of the AP 1000 unit — EXPRO Consulting](#)

³ [US Eximbank Tentatively Agrees On Amount Of Financing For Construction Of Two Power Units At KhNPP – Energoatom Head \(Open4business.Com.Ua\)](#)

though in 2011 the projections were scaled back to just five. Westinghouse has committed to deliver four new nuclear reactors at two US nuclear power sites – 2 units at Virgil C. Summer Nuclear Generating Station (Jenkinsville, South Carolina) and 2 at Alvin W. Vogtle Electric Generating Plant (Waynesboro, Georgia). By August 2017 only the two reactors at Vogtle were still under construction.

Virgil C. Summer abandoned

In March 2017, Westinghouse filed for Chapter 11 bankruptcy because of USD 9 billion losses from the projects.⁴ Later that year, the construction of both reactors at V.C. Summer was cancelled. Jose E. Gutierrez, a former Westinghouse CEO, acknowledged that the nuclear renaissance, was not realistic and never actually happened, as the U.S. had long lost the expertise in the construction of nuclear power plants.⁵

Vogtle delay and costs overruns

Units 3 and 4 of the Alvin W. Vogtle Electric Generating Plant were supposed to start commercial operation in April 2016 and April 2017 respectively. The members of the staff team established by the Georgia Public Service Commission stated in December 2021 that Georgia Power's (the company producing and delivering electricity) forecasts had repeatedly been "unrealistic and unreliable" and that the company had emphasized "pursuing an unrealistic schedule at any cost."⁶ The estimated construction cost of the new Vogtle reactors, not including financing costs, increased by 140 per cent from USD 9.7 billion in 2009 to USD 24.2 billion in the fall of 2021.⁷

The Georgia Nuclear Energy Financing Act of 2009⁸ allowed the recovery of the construction costs before the plant was completed and produced any power. This resulted in Georgia Power's customers paying more than USD 3.5 billion from January 2011 to December 2020 through an addition on their electric bills. According to the Public Service Commission staff, by the time the reactors at Vogtle finally go into service, a typical Georgia Power residential customer will have paid USD 880 for project financing costs.⁹ Thus, for more than a decade, the utility customers have been paying for power they never received.

International presence

Westinghouse's attempts to attain a noticeable share on the international market has also failed. Four AP1000-model reactors were built by Westinghouse in China by 2018.¹⁰ Nonetheless, following Westinghouse's bankruptcy in 2017, the Chinese government decided to build the domestically designed Hualong One reactor

⁴ [South Carolina Wasted \\$9 Billion on a Failed Nuclear Project. So Why Can't We Find Money for a Green New Deal? \(theintercept.com\)](#)

⁵ [Westinghouse CEO opens up about collapse of 2000s 'nuclear renaissance' - The Mainichi](#)

⁶ [Georgia Public Service Commission. Testimony of Donald N. Grace in Georgia Public Service Commission Docket No. 29849.](#) December 1, 2021, p. 6.

⁷ [Southern Company's Troubled Vogtle Nuclear Project. The Institute for Energy Economics and Financial Analysis \(IEEFA\).](#) January 2022

⁸ [Georgia Legislature Sunsets Prepayment of Future Nuclear Plants – Georgia Watch](#)

⁹ [Southern-Companys-Troubled-Vogtle-Nuclear-Project_January-2022.pdf \(ieefa.org\)](#) page 7

¹⁰ [PRIS - Country Details \(iaea.org\)](#)

rather than the AP1000.¹¹ There were also plans to expand the AP1000 technology to India and the UK, but due to financial difficulties and Westinghouse's collapse, the agreements were cancelled.

The absence of perspectives to build more reactors on established markets and the limited number of countries that already have nuclear technology makes Ukraine one of the very few 'safe' countries that could host Westinghouse reactors - in the sense that it already has nuclear energy technology and bringing it in will not increase the risk of nuclear materials or weapons proliferation. However, Ukraine is not able to pay for them.

Toshiba breakup partly caused by Westinghouse

Following the disastrous performance of Westinghouse Electric, its parent company Toshiba suffered huge losses, and Westinghouse ended up filing bankruptcy. As part of restructuring, Toshiba sold Westinghouse to Canada's Brookfield Asset Management Inc. in January 2018. Following a few unsuccessful attempts to resell Westinghouse, Brookfield reached a deal in October 2022 with Canada's Cameco company, that owns a uranium mining business, to sell 49 per cent of Westinghouse's shares.¹²

Energoatom performance

The State Enterprise 'NNEGC 'Energoatom'¹³ is the state-owned operator of the Ukrainian nuclear power plants. In the absence of a capital investment burden (most of the units were completed in Soviet times) and having been relieved of the responsibility for the closure of the Chornobyl nuclear power plant (that was taken over by the state), the price for nuclear electricity in Ukraine has been kept at the level of running costs, not leaving enough money even for future decommissioning or waste management.

In 2013, the European Bank for Reconstruction and Development (EBRD) and Euratom¹⁴ each approved EUR 300 million (USD 400 million) loans for the Ukraine Safety Upgrade Program that allowed Energoatom to extend the lifetime of some of its nuclear reactors. Ensuring that Energoatom charges a tariff that is sufficient for the timely implementation of its obligations is one of the conditions under this agreement.

In 2019, Ukraine introduced an electricity market design which was supposed to make Energoatom profitable, however, still in 2020 the company suffered a loss of UAH 4.8 billion.¹⁵ The government's Decision #483 introduced a special responsibility for Energoatom to deliver electricity at a "price affordable to the population" which limits Energoatom's profitability and thus the ability to borrow.

Energoatom has also failed to implement the safety upgrade program financed by the EBRD and Euratom. The program was supposed to be completed by the end of 2017, but it is still under implementation. Obviously with

¹¹ [China approves construction of six new reactors : New Nuclear - World Nuclear News \(world-nuclear-news.org\)](https://www.world-nuclear-news.org/China_approves_construction_of_six_new_reactors)

¹² [Cameco and Brookfield Renewable Form Strategic Partnership to Acquire Westinghouse Electric Company - News Archive - Media - Cameco](https://www.cameco.com/newsroom/2022/10/20/cameco-and-brookfield-renewable-form-strategic-partnership-to-acquire-westinghouse-electric-company)

¹³ State Enterprise «National Nuclear Energy Generating Company «Energoatom»

¹⁴ European Atomic Energy Community

¹⁵ [Energoatom financial reporting \(energoatom.com.ua\)](https://energoatom.com.ua/en/financial-reporting)

Zaporizhzhia nuclear power plant under Russian occupation, the company cannot complete the safety upgrade program there¹⁶.

Decommissioning and waste fund management liability

Ukraine lacks funds to manage nuclear waste produced by the nuclear industry as well as to decommission reactors. In 2017, Ukraine finally established a national decommissioning body and a decommissioning fund in response to the conditions of the EBRD and Euratom loans.

In 2020, the Ukrainian State Accounting Chamber has completed a report assessing decommissioning funds allocations in 2020, concluding that there are problems with underestimating the cost of the decommissioning, not reviewing the cost of decommissioning in response to inflation and national currency devaluation, and failure to protect the amounts accumulated in the special account from inflation.¹⁷

As of 1 October 2020, the decommissioning fund had accumulated UAH 5096.5 million (USD 178 million at that time) which is far less than the estimated costs for decommissioning of one unit in Bulgaria and Slovakia and the actual cost for Greifswald nuclear power plant in Germany (these range from USD 750 million to USD 1520 million).¹⁸ Energoatom's own estimates suggest decommissioning of one unit at USD 300-400 million.¹⁹

Failure to allocate sufficient funds for decommissioning and nuclear waste management means Energoatom will need to dramatically increase allocations while repaying loans for the new reactors' construction. Alternatively, it will become an additional financial burden on the Ukrainian public that will already face the dramatic financial pressure of post-war reconstruction.

Ukrainian State and Nuclear Regulator's inability to ensure safety

Independence of the nuclear regulator is one of the fundamental requirements for the safe operation of nuclear power plants. Maintaining independent status has been a demand for all projects financed by international institutions in the Ukrainian nuclear industry. While Ukrainian legislation provides an independent status for the State Nuclear Regulatory Inspectorate, in reality there are doubts about its ability to act independently.

In the most recent case, in December 2021, the Prime Minister of Ukraine publicly suggested punishing the head of the Nuclear Inspectorate for Energoatom's failure to obtain a licence to operate a nuclear waste storage facility²⁰. There is a risk of nuclear safety gradually becoming secondary to production, which may lead to the

¹⁶ Site of nuclear regulator is down following hacker attack [Acting head of SNRCU takes part at the online meeting with the EBRD](#)

¹⁷ [Report on the results of the audit of the effectiveness of the receipt and use of state budget funds #30-4](#). Accounting Chamber. Kyiv 2020.

¹⁸ [Підготовка до зняття з експлуатації діючих АЕС України: прогрес та виклики](#). Ecoaction. 2018.

¹⁹ [«Енергоатом» оцінює вартість зняття з експлуатації блоку АЕС у \\$300-400 млн — EXPRO Consulting](#)

²⁰ [Спецоперація «Усунення»: чому незалежність Держатомрегулювання під загрозою | Mind.ua](#)

violation of a number of Ukraine's international commitments, according to Ukrainian thinktank the Razumkov Center²¹.

Nuclear risks associated with the war

No nuclear power plant in the world has been designed to operate under wartime conditions²². The Russian war on Ukraine has created numerous risks from the occupation of Zaporizhzhia nuclear power plant where the head of the International Atomic Energy Agency (IAEA) saw 'the very real risk of a nuclear disaster that could threaten public health and the environment in Ukraine and beyond'.²³ Russian missile attacks on Ukrainian energy infrastructure have exposed the vulnerability of centralized energy production with few distribution nodes, which massive nuclear power plants are designed for. It is difficult to envisage what will happen to Russia once its war on Ukraine is over. Ukraine might continue to live in constant risk of a new attack. New nuclear will increase the risk of an accident and will prevent development of a secure distributed network.

Recommendation

The US EXIM Bank should make it clear that it will not finance or guarantee the construction of nuclear power plants in Ukraine in view of the financial and security risks. Instead, US public funding should be directed to support a modern distributed energy system based on renewable energy and improved efficiency of the nation's energy use.

²¹ [Ukraine 2021-2022: Modest Results, Immense Challenges](#). 2021. Razumkov Center. p. 60

²² [Putin's War Exposes Risks to Deploying Small Nuclear Reactors - Bloomberg](#)

²³ [Director General Grossi Alarmed by Shelling at Ukraine NPP, says IAEA Mission Vital for Nuclear Safety and Security | IAEA](#)