Nuclear Energy Undermines the Renewable Transition

Why Multilateral Development Banks Must Not Finance Nuclear Energy

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Amid growing pressure to address the climate crisis, some governments are pushing for a nuclear comeback. At COP28 in December 2023, 22 countries pledged to triple global nuclear capacity by 2050; the list grew to 31 countries at COP29 the following year. The pledge was based mainly on promises around new technologies like Small Modular Reactors (SMRs) being faster, cheaper, and "clean."[1] These claims don't hold up to scrutiny.

Nuclear energy is a costly distraction from the true energy transition. It delays the shift to renewable solutions, poses serious safety and security risks, and creates radioactive waste that future generations will be forced to manage. Multilateral development banks (MDBs) must stop financing nuclear energy and focus instead on clean, fast, and flexible renewable systems. Here are five reasons why MDBs should not finance nuclear energy:

1. SMRs are More Expensive and Take Longer to Build Than Promised

Only three SMRs are operating globally. All took much longer to build and cost far more than promised.[2] The Vogtle project in the United States is a prime example: it went from an initial estimate of $14 billion to over $30 billion, with a delay of more than six years.[3] Similarly, CAREM 25 in Argentina saw costs surge by 600% since 2013, and it won't be operational until at least 2027.[4]

Other SMR projects show the same pattern. Russia's shipborne SMRs, China's Shidao Bay SMR, and NuScale in the US face similar delays and ballooning costs. In these cases, the actual or estimated construction time is 12 to 13 years, far exceeding the promised 3 to 4 years.

2. Nuclear Is Inflexible and Too Expensive for Flexible Generation

It is often argued that nuclear power can complement renewables by providing energy during periods of solar and wind lows. In reality, nuclear energy is poorly suited for this role.

Nuclear reactors are not designed to ramp up and down quickly. They require long lead times to start and are economically dependent on constant full-capacity operation.[5] Using them only as backup makes their operation even more expensive and inefficient—costs can be two to ten times higher when reactors operate at partial capacity. In contrast, battery storage, grid interconnections, demand-side management, and flexible renewables offer faster, cheaper, and more reliable backup solutions—without the risks and long-term waste burden of nuclear.

[1] www.powermag.com/22-countries-including-u-s-pledge-to-triple-nuclear-power-capacity/
[2] https://ieefa.org/resources/fact-sheet-do-small-nuclear-reactors-smrs-make-sense-australia
[3] https://ieefa.org/articles/ieefa-us-price-tag-new-reactors-vogtle-plant-georgia-climbs-past-30-billion
[4] https://ieefa.org/sites/default/files/2024-05/SMRs%20Still%20Too%20Expensive%20Too%20Slow%20Too%20Risky_May%202024.pdf
[5] https://ieefa.org/resources/fact-sheet-do-small-nuclear-reactors-smrs-make-sense-australia

3. Nuclear Energy Is Not CO_2-Neutral

Nuclear energy is often touted as a "clean" energy source, but this claim overlooks the full lifecycle emissions of nuclear power. While emissions are low during the electricity generation phase, significant greenhouse gases are emitted during uranium mining, fuel production, plant construction, decommissioning, and nuclear waste management.

Studies show that nuclear energy can emit up to 190g CO_2 per kWh— much higher than wind or solar energy.[6] Furthermore, the risks of radiation leaks or accidents during operation add another layer of environmental harm. When compared to renewable sources, nuclear simply cannot match the low-emission benefits of truly clean energy technologies.

4. Nuclear Delays the Transition to Renewables

Investing in nuclear, particularly SMRs, diverts crucial resources away from cheaper, more scalable renewable technologies like solar, wind, and energy storage. The time and money poured into nuclear—years spent on licensing, approval, and construction—prevents the immediate development of low-cost renewables that can be deployed today.[7]

5. Nuclear Is a Huge Safety and Environmental Risk

Nuclear energy not only poses significant safety risks, as accidents like Chernobyl and Fukushima have shown, but it also raises serious security concerns. Nuclear technology can be used to develop nuclear weapons, increasing the potential for proliferation. In addition to the five "official" nuclear weapons possessing states – the USA, Russia, China, France, and the United Kingdom – there are four "de facto" nuclear weapons possessing states: India, Pakistan, Israel, and North Korea. The spread of Small Modular Reactors (SMRs) could increase the threat of nuclear weapons further.

Furthermore, the disposal of nuclear waste remains an unsolved problem, with radioactive materials such as plutonium and uranium remaining hazardous for tens of thousands of years. Current storage solutions are temporary and inadequate, with no permanent waste repository in operation anywhere in the world. This means that future generations will continue to bear the burden of storing and securing nuclear waste, which imposes massive financial and environmental costs.

[6] https://www.stormsmith.nl/Resources/m40wastemanagement20190912F.pdf, p. 59
[7] https://www.neimagazine.com/news/ieefa-report-critiques-feasibility-of-small-modular-reactors/?cf-viewww