

Nuclear Energy Isn't the Solution to Climate Catastrophe

As the climate crisis brings droughts, floods, wildfires, food shortages, extreme weather and other threats to human life,¹ advocates and policy makers seek solutions to prevent environmental catastrophe. Although technology exists to support a full transition to clean, renewable energy,² many still peddle false solutions like nuclear power. Neither clean nor renewable, nuclear power comes at a significant cost to the environment and the public.³

Nuclear Energy Is Incompatible With the Climate Crisis

Nuclear energy supporters promote its expansion as an opportunity to tackle climate change.⁴ But nuclear cannot rise to the urgency of averting climate disaster and is itself vulnerable to climate change.

Nuclear power plants take an estimated 10 to 19 years from planning to operation, compared to 2 to 5 years for utility-scale solar and wind plants.⁵ This simply cannot meet the carbon reduction timeline needed to fight climate change. Nuclear is also expensive. Per kilowatt-hour, new plants cost 2.3 to 7.4 times more than onshore wind or utility-scale solar plants,⁶ and unsubsidized levelized costs for nuclear energy have increased while solar and wind costs have dropped.⁷ New nuclear technologies that could reduce construction times and costs are years away from being commercially available and need considerable investments from the government.⁸ Nuclear plants rely heavily on subsidies, and studies have found that it would be more economical to replace them with clean energy and energy efficiency upgrades.⁹

Heavy reliance on water makes nuclear power plants vulnerable to a changing climate where extreme weather events are more prevalent. Droughts, water shortages and increasing water temperatures can reduce electricity generation at facilities or cause temporary shutdowns.¹⁰ These temperature concerns are greater in the summer when electricity demand is highest, making them an unreliable energy source.¹¹

Don't Mistake Nuclear Energy for Clean Energy

Claims about “carbon-free” nuclear energy focus solely on emissions from electricity generation and leave out the climate-destroying emissions from the full nuclear life cycle.¹² Studies have found that while nuclear produces fewer greenhouse gases per kilowatt-hour generated than fossil fuels, emissions are significantly higher than from wind and solar power.¹³ Wind energy, for example, produces 7 to 25 times less carbon dioxide pollution than nuclear.¹⁴

Beyond emissions, nuclear energy threatens public health and the environment. Nuclear accidents have resulted in major releases of radioactive material, fatalities, evacuations and increased incidence of acute radiation syndrome, cancer and mental health impacts.¹⁵ People exposed to low levels of radiation, such as nuclear power plant workers, face increased risk of death from leukemia.¹⁶ And environmental harms are seen throughout the nuclear life cycle. Mining uranium — the nonrenewable resource that powers nuclear plants — has led to contamination of surrounding waters and lands.¹⁷ Nuclear power plants leaked radioactive tritium into ground water from aging pipes.¹⁸ And nuclear waste is dangerous and lacks suitable disposal options.¹⁹

Nuclear Energy Has a Waste Problem

Spent fuel — the waste produced after nuclear electricity generation — remains radioactive for thousands of years and can quickly emit lethal amounts of radiation, making safe storage and disposal a critical challenge.²⁰ Although there are no good solutions for safe, long-term nuclear waste disposal, the global consensus has been to store it underground in geologic repositories.²¹ The United States has yet to establish such a site.²² Despite the absence of a safe storage facility, nuclear power plants continue to operate.

Roughly 80,000 metric tons of radioactive waste has been generated by nuclear power plants in the United States and is being stored at 75 reactor sites across more than 30 states.²³ The majority of spent fuel is stored in pools never meant for long-term storage.²⁴ Because no permanent re-

pository exists, the pools contain waste at a higher density than intended and hold more radioactivity than nuclear reactor cores, but they lack the same level of containment and protection as reactors.²⁵ Around 25 percent of waste is stored in dry casks, which, while safer, can only accommodate spent fuel that has already been cooled in pools for several years.²⁶ The intractable problem of storing radioactive waste makes nuclear a dangerous and shortsighted option for energy production.

Conclusions and Recommendations

Nuclear energy is not the solution to climate catastrophe. It fails to address the climate crisis, harms the environment and threatens public health. Instead, we must move forward with 100 percent clean, safe and renewable energy sources like wind and solar by 2030. The transition to renewables grows increasingly more affordable, technically feasible and politically acceptable, while similar factors have idled for nuclear power.²⁷

Endnotes

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