The Colorado Renewable Energy Society's Position on Nuclear Power

Updated April 2026

Guiding Principle: CRES recognizes that addressing climate change is an urgent issue. This requires transitioning to zero-carbon energy sources in the safest, most cost-effective, and fastest way possible.

Background

As the last coal plants in Colorado shut down, nuclear power proponents are campaigning to replace them with nuclear reactors. An advisory committee[1] for the City of Pueblo recommended that Xcel replace its Comanche 3 coal plant with an "advanced nuclear power plant." At the same time, the nuclear power industry is promoting the deployment of new reactors to power large data centers. Likely in response to nuclear power industry lobbyists, the Colorado State Legislature recently passed a bill falsely redefining nuclear as a "clean energy resource."[2]

Summary

While there may arguably be some states where new nuclear power could be evaluated as an option for the supply of carbon-free electricity, the State of Colorado, which is blessed with large, low-cost solar and wind resources and an electric grid that is already rapidly decarbonizing, is not one of them. In this position paper, CRES explains the various issues associated with nuclear power with special emphasis on the three reasons why new nuclear power plants would be a poor fit for Colorado's electricity needs: 1) high capital cost, 2) long deployment time, and 3) lack of flexibility in a grid that is increasingly powered by variable renewables.

The Changing Energy Landscape

Most existing nuclear power plants were built in the 1970s and 1980s, and these plants can be credited with significantly reducing carbon and air pollution emissions from the electricity sector. At the time these plants were built, nuclear power was the only viable option for providing zero-emissions electricity in regions with limited new hydropower resources.

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[1] Mark Jaffe, "Only a nuclear reactor can make Pueblo 'whole' after Xcel Energy closes last coal-fired plant, local group says," *The Colorado Sun*, January 8, 2024, https://coloradosun.com/2024/01/08/pueblo-nuclear-reactor-comanche-station/

[2] Parker Yamasaki, "Nuclear power is officially a clean energy source in Colorado. Not everyone is pleased." *The Colorado Sun*, April 2, 2025, https://coloradosun.com/2025/04/01/hb-1040-nuclear-energy-colorado-designation/

However, the energy landscape has changed dramatically since the heyday of nuclear power. While the cost to build new nuclear power plants has greatly increased, we have witnessed dramatic reductions in the costs of solar, wind, and batteries. Wind and solar power plants with battery storage now have about one-tenth the capital construction cost in $/kW as a new nuclear power plant. In addition, at a time of accelerating climate change when urgent action is needed, solar and wind power plants can be built at least five times faster than a nuclear power plant.

Colorado's Previous Experience with Nuclear Power

Colorado's only experience with nuclear power, the Fort St. Vrain high-temperature gas-cooled reactor, was unfortunately not a good one. Completed seven years behind schedule, the reactor began commercial operation in 1979 and was shut down in 1989 after only ten years of operation due to mounting ratepayer impacts caused by safety and operational problems. It took 3 years to decommission the plant at a cost[3] (in 2018 dollars) of $230 million, which, like the $700 million of plant costs, was incurred by Xcel ratepayers. For 37 years, St. Vrain's 15 tons of high-level radioactive wastes have been stored in 244 canisters in a special facility[4] protected by armed guards. These wastes will ultimately need to be safely transported out of Colorado to be deeply buried for tens of thousands of years in underground storage that has still yet to be identified.

The experience with uranium mining has been similarly negative. The Schwartzwalder mine above Ralston Creek left a legacy of severe groundwater contamination and the requirement for continuous remediation of water feeding Ralston Reservoir. The reservoir supplies roughly 1.3 million people in the Arvada and neighboring areas, and the cost of remediation is borne by the State of Colorado. The tragic increase in cancer cases in the Navajo Nation associated with uranium mining operations and uranium tailings is well known. It is no wonder that Colorado energy experts were dismayed when the 2025 Colorado legislature passed House Bill 25-1040, which egregiously reclassified nuclear energy as "clean."

CRES's Perspective on New Nuclear Power

Beyond the issue of highly radioactive waste products that require thousands of years of storage, CRES believes new nuclear power investment in Colorado is a terrible choice for new electric generation on our grid for three primary reasons:
1. High Cost

The newest nuclear power plants have come at an exorbitant cost that burdens ratepayers for decades. The latest U.S. reactors to come online, Vogtle Units 3 and 4 in Georgia, which employ the much-touted Westinghouse AP-1000 standardized design, were completed seven years behind schedule at a cost of $36.8 billion[5]—more than two-and-a-half times their original

[3] The Nuclear Decommissioning Collaborative, "Fort St. Vrain," https://decommissioningcollaborative.org/fort-st-vrain/
[4] U.S. Nuclear Waste Technical Review Board, "Department of Energy-Managed Spent Nuclear Fuel at Fort St. Vrain, Revision 1, June 2020, https://www.nrc.gov/docs/ML2210/ML22107A007.pdf
[5] Margaret Walker, "Were rate hikes, Vogtle to blame for Georgia Power customers' service disconnections?," *The Telegraph*, March 28, 2025, https://www.macon.com/news/environment/article301776774.html

budget. Their capital cost was $17,000 per kilowatt, which is nearly ten times the cost of a utility-scale solar plant with battery storage. As a result, Georgia Power ratepayers were hit with an unprecedented 23.7% increase in their electric bills.

Nuclear industry promoters have argued that so-called small modular reactors, or SMRs, (classified as 300 MW or smaller in size) will reduce the cost of nuclear power. This claim not only has no merit, but it contradicts basic engineering design principles because these concepts lose the economy-of-scale benefit that caused reactor sizes, like the Vogtle units, to reach 1100 MW in the first place. Of course, a small reactor will be cheaper to build than a large one, but it will cost much more per unit of energy delivered, and that is the cost that matters. The one SMR design approved by the Nuclear Regulatory Commission, NuScale, which was scheduled to be built in Idaho, was finally canceled[6] because its projected capital cost had risen to $20,000 per kilowatt and was still going up.

Because nuclear power plants contain nuclear fuel and radioactive waste, they must be protected by armed guards from terrorist attacks. Having many small reactors spread across the country would greatly increase the number of sites that must be protected. There are many new SMR concepts being pursued. Because most of these depart from the design that has been used for decades, there is a high probability of unanticipated issues resulting in construction delays and cost overruns. Finally, researchers at Stanford University and the University of British Columbia compared three different SMR designs to conventional large reactors and concluded that their smaller size results in a larger percentage of neutron leakage, which increases the volume of nuclear waste by factors of 2 to 30.[7] For all of these reasons, SMRs are not a viable solution to the high cost of nuclear power.

2. Long Deployment Time

The total time from concept to operation[8] for new nuclear power plants is about 15 years—assuming they are not abandoned due to large cost overruns, as have often occurred. This compares to 1-to-2 years for solar and wind projects. While a nuclear plant is under construction, many new solar and wind plants could be built instead at much lower cost and thus avoid a huge amount of air pollution and climate change emissions. In a Fall 2025 article titled The Next Nuclear Renaissance?,[9] the conservative Cato Institute concluded:

> The problem is not so much that money will be wasted on large numbers of uneconomic facilities. Rather, it is the opportunity costs of the time and human resources that are consumed by nuclear power and not available to other, quicker, more cost-effective and less financially risky options. We appear now to be facing serious risks from climate

[6] Ivan Penn and Brad Plummer, "Nuclear Energy Project in Idaho is Canceled," *The New York Times,* November 8, 2023, https://www.nytimes.com/2023/11/08/business/energy-environment/nuclear-energy-idaho-nuscale.html#:~:text=

[7] Lindsay M. Krall, et al., "Nuclear waste from small modular reactors," *Proceedings of the National Academy of Sciences*, May 31, 2022, https://www.pnas.org/doi/full/10.1073/pnas.2111833119

[8] "We Need Solar and Storage to Address the Energy Emergency ," Solar Energy Industries Association, February 4, 2025, https://seia.org/blog/we-need-solar-and-storage-to-address-the-energy-emergency/

[9] Steve Thomas, "The Next Nuclear Renaissance?," *Regulation*, Cato Institute, Fall 2025, https://www.cato.org/sites/cato.org/files/2025-09/regulation-fall-2025-1.pdf

change, and there will not be a second chance if we fail to tackle it because too many resources are being consumed by an option—new nuclear—that will not work.

3. Lack of Flexibility

Nuclear power proponents argue that because nuclear plants run 24 hours a day, they can fill in the gaps when solar and wind are not available. But let's take a closer look at that claim. Xcel plans to provide over 80% of its electricity from solar and wind[10] by 2030. Although Colorado is very sunny year-round, grid operators must be prepared for occasional "dark lull" periods of several days or more when local solar and wind resources are limited by the weather. Xcel Energy plans to burn stored natural gas in low-cost combustion turbines during these brief periods.

Now imagine if new nuclear power plants come onto the grid in 15 years. Like all nuclear plants in the U.S., they will need to be run at full power 24 hours a day to sell enough electricity to pay off their large debt. That means they cannot vary the power they provide to the grid. (Although it is theoretically possible to add molten salt thermal storage to a reactor power plant, this would further increase the already high capital cost and introduce reliability issues.) So, when an occasional dark lull occurs and solar and wind power drop off, the utility won't be able to boost nuclear plant output because it will already be operating at full power. Furthermore, because a new nuclear plant will duplicate power already being provided by solar and wind, it will cause that renewable electricity to be wastefully curtailed.

The bottom line is that an inflexible, baseload nuclear power plant, of the type that was developed for our 20th century electric grid, is exactly the wrong type of plant to support our modern 21st century smart grid. It would be hopelessly obsolete by the time it is finally completed.

Conclusion

CRES opposes the use of any taxpayer or ratepayer funds to support new nuclear power plants in Colorado or nuclear power plant studies because these plants are highly unlikely to provide timely, economic, reliable, carbon-free power. Instead, CRES believes that funds should be invested in the rapid harnessing of Colorado's abundant, low-cost solar and wind resources, together with end-use energy efficiency, storage, demand response, and transmission. These proven solutions address the urgent need to immediately and cost-effectively reduce both carbon and air pollution emissions.

[10] "Colorado proposal adds unprecedented renewable energy and storage," Between the Lines, Xcel Energy, September 19, 2023, https://stories.xcelenergy.com/stories/Colorado-proposal-adds-unprecedented-renewable-energy-and-storage