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Nuclear Power Gets New Push in U.S., Winning Converts

With challenges in meeting clean energy goals and new electricity demands, politicians in both parties seek to prolong and even expand reactor use.

By Ivan Penn

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Driven by the difficulty of meeting clean energy goals and by surging electricity demands, a growing number of political leaders are taking a fresh look at nuclear power — both extending the life of existing reactors and building new ones.

Even past skeptics, largely Democrats, have come around to the idea — notably in California, where the state's sole remaining nuclear plant, Diablo Canyon, is scheduled to close in 2025. The search for clean energy has given nuclear power a spark that has drawn bipartisan support that added billions in funding for existing and new projects.

But critics of the nuclear industry argue that a veneer of clean energy has not changed the concerns about the technology, including aging facilities in need of potentially costly improvements, the challenge of nuclear waste disposal and steep cost overruns for new projects that are years late — if they reach completion.

"The industry knows it does not have a good story to tell," said Edwin Lyman, a physicist and the director of nuclear power safety with the Union of Concerned Scientists. "It's still plagued by the same issues."

President Biden wants to eliminate greenhouse gas emissions from the power industry by 2035, and he said a Supreme Court ruling last week limiting federal regulatory authority would not halt such efforts. But the supply chain issues that have hurt wind and solar power development have presented the latest hurdle to reaching that goal.

As a stopgap, the Biden administration has established a $6 billion fund to help troubled nuclear plant operators keep their reactors running and make them more economically competitive against cheaper resources like solar and wind power. The application deadline is Tuesday, though it might be extended and the requirements amended to broaden eligibility.

“The Biden administration has been very clear that we will get to the net zero goals,” Kathryn Huff, assistant secretary for nuclear energy at the Department of Energy, said at a recent conference of the American Nuclear Society. “They’re incredibly aggressive goals, and nuclear is a part of that solution, a very big part potentially.”

In addition to the $6 billion fund, the administration is providing $2.5 billion for two projects meant to demonstrate new nuclear technology, in Washington State and Wyoming.

A separate bipartisan measure introduced last year is aimed at preserving and expanding nuclear energy in the United States. The bill, whose backers include Senators Shelley Moore Capito, Republican of West Virginia, and Cory Booker, Democrat of New Jersey, would provide financial assistance like tax credits, according to the Tax Foundation, a nonprofit tax policy organization.

Ms. Capito has argued that coal-fired power plants, which have been closing as the nation moves away from fossil fuel sources, could become sites for nuclear reactors. That would provide benefits for places like her home state, which has produced coal and relied on it as fuel for power generators.

“Ultimately, you get to a point where you need something that’s not weather dependent, something like nuclear to make the grid reliable,” said John Kotek, who ran the Office of Nuclear Energy during the Obama administration and is now vice president for policy at the Nuclear Energy Institute, a trade association. “There are other technologies that are candidates to play that role, but if you look at what is available today across the widest scale, that’s nuclear energy.”

The rising costs of other sources of power have made nuclear energy more competitive around the world, including in the United States, which has the largest fleet of nuclear plants of any country. They produce about 20 percent of the nation’s electricity and 50 percent of the clean energy.

The United States maintains 92 reactors, though a dozen have closed over the last decade — including, a month ago, the Palisades Nuclear Generating Station in Michigan, about 55 miles southwest of Grand Rapids.

The owner, Entergy, decided to shut the plant after a power-purchase agreement with a utility expired. Entergy said it could not find buyers for the plant, and decommissioning has gone too far to bring it back online, even with the money from the federal government.

Diablo Canyon is next on the decommissioning list, but Gov. Gavin Newsom has proposed extending its life. The plant, on California’s central coast, supplies almost 10 percent of the state’s electricity. Pacific Gas & Electric, which owns the plant, announced in 2016 that it planned to close it when its licenses expired, saying it would focus more on solar and wind power as renewable energy sources.

Among those backing an extension is Senator Dianne Feinstein, a California Democrat, who had supported closing the plant. To meet clean energy goals while addressing power demands arising from climate change, “Diablo must keep operating, at least for the time being,” she declared in an essay in The Sacramento Bee under a headline that said, “Why I changed my mind.”

A study last year by Stanford University and the Massachusetts Institute of Technology found that keeping Diablo Canyon open for 10 years could reduce the California power industry's carbon emissions by more than 10 percent from 2017 levels and reduce reliance on natural gas. It also could save $2.6 billion in electricity costs and help prevent brownouts.

Brownouts and blackouts are an increasing concern, especially with more extreme weather events. The California Independent System Operator, which operates the electric grid that supplies power to about 80 percent of the state, says this summer could bring the highest load in the system operator's 24-year history.

PG&E won't say whether it supports extending the life of the plant, only that it will follow any decision and guidance from the state.

Diablo Canyon is scheduled to close in 2025. If kept open, it could save $2.6 billion in electricity costs and help prevent brownouts, a study found. Mark Ralston/Agence France-Presse — Getty Images

A leading critic of keeping Diablo Canyon open is Arnie Gundersen, the chief engineer at Fairewinds Energy Education, a nonprofit organization focused on the perils of nuclear power. The organization often points to the radioactive leak from the Fukushima nuclear plant in Japan after an earthquake and tsunami in 2011, a disaster that cost public support for reactors.

Mr. Gundersen, a nuclear engineer who once worked in the industry and is a frequent expert witness on utility matters across the country, said he thought Diablo Canyon would need significant improvements to operate beyond 2025.

“To keep uneconomical nukes running will use much more than the $6 billion that Biden has proposed,” Mr. Gundersen said. “That’s chump change for nuclear to remain competitive. I think he’s got some really smart people in his brain trust, yet he’s reaching out for political fig leaves to get the nuclear industry off his back.”

To proponents of nuclear energy, Diablo Canyon represents a pivotal moment. Coupled with solar, wind and hydroelectric power, they say, nuclear power would make 100 percent clean energy possible.

“I can easily see a doubling of nuclear generation in this country,” said Steven Nesbit, a nuclear engineer who spent decades at Duke Energy and is the immediate past president of the American Nuclear Society, an organization of scientists, engineers and industry professionals. “We are solar and wind’s best friend. They just can’t do the job themselves.”

Industry leaders recognize that the age of new large-scale nuclear plants in the United States has passed, chiefly because of runaway costs. Two new units at the Vogtle Electric Generating Plant in Waynesboro, Ga., expected to come online in 2023, are costing about twice the original estimate of $14 billion. A nuclear project in South Carolina drove the utility developing it into bankruptcy.

But many in the industry say smaller reactors that can be expanded over time offer promise of avoiding long delays and high cost. These reactors, they say, can be built in factories and delivered to approved sites. And the reactors’ high-

temperature steam could also yield significant amounts of hydrogen, a carbon-free alternative fuel to natural gas.

The project locations can plan for as many as a dozen units but start with just one. But a plant with 12 units would produce half the electricity or even a little less than many other large nuclear facilities.

None of the smaller reactors have been certified by the Nuclear Regulatory Commission, which approves licenses and operations of the nation's nuclear power plants. But NuScale Power, a company that designs and markets small reactors in Oregon, expects to receive certification of its design by the end of the summer. A developer then would need approval for a license to build and operate the unit.

Thomas Mundy, chief commercial officer for NuScale Power, said his company's product could be built and put into use in about three years, a fraction of the time it takes to build larger reactor units. And the cost, Mr. Mundy said, is competitive with new natural gas facilities at a levelized cost — the electricity price needed to break even at the end of the plant's life — of $45 to $65 a megawatt-hour.

By comparison, a utility-scale solar farm costs $28 to $41 a megawatt-hour and a wind farm $26 to $50, according to the latest analysis by Lazard, the investment firm.

Mr. Mundy said his company's product would be built by BWX Technologies, a manufacturer of naval nuclear reactor cores based in Lynchburg, Va., as well as by companies in South Korea and Japan.

Concerns about safety, cost and construction delays are not going to be the same as with earlier reactors, he said, because the new ones will have fewer components and will have uniform manufacturing processes, reducing the likelihood of the kinds of failures that come with making each plant unique.

"I think those people are not studying the realities," Mr. Mundy said of the critics of the new reactors. "We need to continue to educate."

But at least one of those critics, Mr. Gunderson, is unconvinced. “We’re falling for the same mistakes that we’ve fallen for over the last 50 years,” he said. “I will shut up and retire if you can show a nuclear plant that was built at cost and on schedule.”

Ivan Penn is a Los Angeles-based reporter covering alternative energy. Before coming to The New York Times in 2018 he covered utility and energy issues at The Tampa Bay Times and The Los Angeles Times. More about Ivan Penn

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