

## North America

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Alternative Energy | Nuclear Power

# New York Grid Operator Counts on Natural Gas to Replace Indian Point Nuclear Capacity

## New Technologies Provide Some Hope While Overall Outlook Remains Bleak

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Policy Brief

### Contact

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### Key Takeaways:

- The New York Independent System Operator says the deactivation of the Indian Point nuclear plant in 2021 will not affect system reliability if approximately 1,800 MW of gas-fired generation come online as planned
- Competition from cheap natural gas and Westinghouse reactor design failure have caused nuclear operators and developers to retire their plants early and cancel new projects
- New generation technologies may reverse the demise of nuclear caused by high construction costs, glut of inexpensive natural gas, and uncertain future demand

### Entities Mentioned:

- Department of Energy
- Energy Information Administration
- Georgia Public Service Commission
- New York Independent System Operator
- North American Electric Reliability Corporation
- Nuclear Regulatory Commission

### Related Research

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[Connecticut Passes Bill Paving Way to Subsidize Dominion Nuclear Plant](#)

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[DOE Grid Reliability Study to Examine Impact of Renewables on Baseload Generation](#)

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## Insight for Industry – New York Prepares for Indian Point Nuclear Plant Closure amid Dim Hopes for U.S. Nuclear Renaissance

On December 13, 2017, the New York Independent System Operator ([NYISO](#)) [released](#) an assessment of the proposed retirement of the Indian Point nuclear plant finding that the event in 2021 will not affect system reliability if 1,800 MW of gas-fired plants come online as planned.

The [assessment](#) comes as nuclear plants continue to suffer from competition from cheap natural gas and renewables. To counter this trend, New York implemented a program in 2016 to compensate eligible nuclear plants for every MWh of carbon-free electricity they generate, excluding Indian Point citing its proximity to the New York metropolitan area. Illinois followed suit with a similar program, and Ohio is considering legislation to create such a plan for its struggling nuclear fleet, which will face even more competition from a 955 MW natural gas-fired facility approved this month. Connecticut enacted legislation ([SB 1501](#)) in October that [could](#) allow Dominion Energy's Millstone nuclear plant to enter into a competitive procurement process along with renewables if corroborated by an ongoing study into the plant's viability.

The outlook for new nuclear reactors also remains grim. The bankruptcy of the reactor designer Westinghouse Electric, a subsidiary of Toshiba, in March led South Carolina utilities South Carolina Electric & Gas (SCE&G), subsidiary of SCANA, and Santee Cooper to stop construction at the two-unit V.C. Summer nuclear plant. South Carolina Senators have proposed bills to shield consumers from rate hikes tied to the failed \$9 billion project, which leaves just two new nuclear units under construction in the U.S., namely, the Vogtle project in Georgia. In August, Georgia Power, subsidiary of Southern Company, took over from Westinghouse as the main contractor and recommended to the Georgia Public Service Commission ([GA PSC](#)) to continue the project despite cost overruns and delays assuming future payments from Toshiba, availability of production tax credits, and extension of loan guarantees from the Department of Energy ([DOE](#)). The [GA PSC](#) has scheduled a hearing for December 21 to decide on the future of Vogtle. Following the bankruptcy, Duke Energy also canceled its [Lee](#) project in South Carolina and [Levy](#) project in Florida.

The V.C. Summer plant's unfinished reactors – based on the AP1000 design touted to be safer and cheaper – were thought to revive the U.S. nuclear power industry. However, in recent years, the glut of cheap natural gas from the shale revolution has made it difficult for nuclear to compete. On December 14, the North American Electric Reliability Corporation [highlighted](#) the shift away from conventional generation through retirements and canceled projects due to slower demand growth and rapid additions of natural gas-fired and renewable resources, as well as tightening reserve margins in some regions. The agency recommended focusing on the reliability and resilience attributes of coal and nuclear generation.

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Apart from state efforts, DOE’s recently proposed grid resiliency rule ([RM18-1-000](#)), aimed to value reliability and resiliency attributes of generation with on-site fuel supplies, has brought optimism for financially struggling nuclear power plants. However, as long as market factors remain unfavorable, it remains to be seen whether advanced technologies bring about a resurgence of the dwindling nuclear industry.

**Natural Gas-Fired Generation to Replace Lost Capacity from Indian Point Nuclear Plant Retirement**

The NYISO report assesses whether any reliability needs will arise over a five-year period from 2018 to 2023 due to the deactivation the Indian Point nuclear plant unit 2 (1,299 MW nameplate capacity) in 2020 and unit 3 (1,012 MW) in 2021. The grid operator expects three new gas-powered plants to meet the lost capacity: Bayonne Energy Center II Uprate (120 MW), CPV Valley Energy Center (678 MW), and Cricket Valley Energy Center (1,020 MW).

Before the new plants come online, the NYISO expects to meet resource needs through a combination of generation, transmission, energy efficiency, and demand response. The NYISO said that it would further evaluate reliability needs through 2028 in an assessment next year using up-to-date information at the time. However, replacing the lost nuclear power capacity with natural gas will certainly not help New York meet its ambitious emissions reductions and renewable energy goals.

In January, New York Governor Cuomo announced that Entergy agreed to close the Indian Point Unit 2 in April 2020 and Unit 3 in April 2021, 14 years earlier than anticipated under federal re-licensing terms. The Indian Point closure, along with the retirements of the Yankee (VT), Pilgrim (MA), Palisades (MI), will complete Entergy’s exit from the merchant power business. Only its FitzPatrick plant (NY) will remain online since Exelon agreed to purchase the facility after New York approved the subsidies for its upstate nuclear facilities – Ginna, Nine Mile Point, and FitzPatrick. Pushing for the closure of Indian Point due to potential danger to the New York metropolitan area, Governor Cuomo excluded the plant from the nuclear subsidy program.

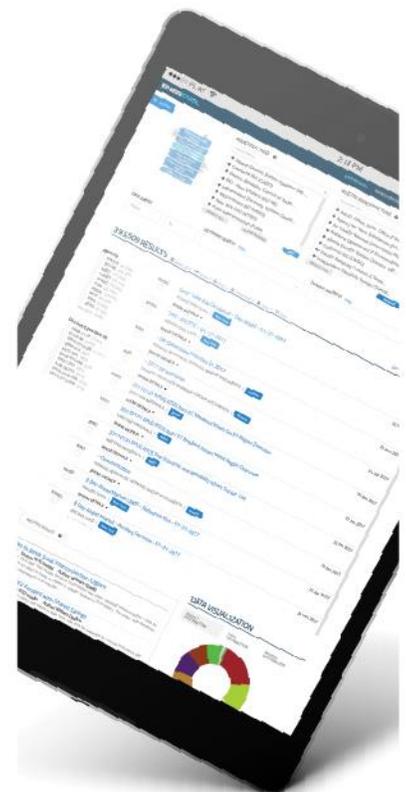
According to EIA, six commercial reactors [have](#) shut down since 2013, and eight more have announced plans to retire by 2025 mainly due to economic factors (Figure 1).

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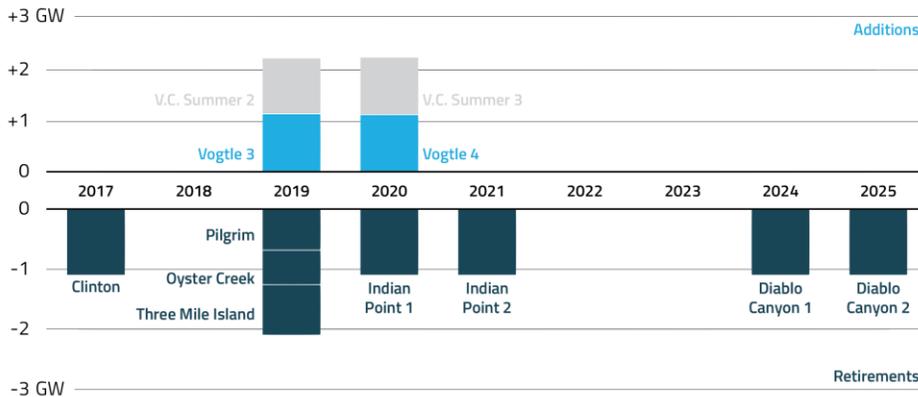
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**Figure 1 - Announced U.S. Nuclear Additions and Retirements (2017-2025)**  
**Six commercial reactors have shut down since 2013, and eight more have announced plans to retire by 2025.**



Source: EIA

**Construction Setbacks Add to Nuclear Industry Woes**

The abandonment of the V.C. Summer project has come as a significant blow to the industry especially since its simplified AP1000 plant design was touted as cost-effective. In July, SCE&G and Santee Cooper decided to stop construction of the project after having spent nearly \$9 billion and ten years on its two reactors, which were scheduled to go online in 2019 and 2020. According to DOE, the project construction was over 64 percent complete as of May 2017, setting the project at least five years behind schedule. In November, SCE&G proposed a \$4.8-billion solution to solve the issues caused by the cancellation including a 3.5 percent reduction in electric rates for SCE&G customers and a \$2.9 billion cut in shareholder earnings to absorb the construction costs. The proposal also included the addition of 100 MW of large-scale solar and a 540-MW natural gas-fired plant to SCE&G’s system, replacing more than 40 percent of the projected power that was to be provided by V.C. Summer.

On December 6, South Carolina lawmakers introduced legislation that would cut rates charged by SCE&G and Santee Cooper by 18 and 14.3 percent, respectively, for the abandonment of the V.C. Summer plant.

The nuclear debacle in South Carolina has drawn attention to the Vogtle nuclear plant in Georgia which is also facing the brunt of Westinghouse bankruptcy. The GA PSC has [suggested](#) that Vogtle project may be in a better position given its five percent impact on rates – compared to SCE&G’s 18 percent – spread across over three times more customers, Toshiba’s \$3.7 billion parental guarantee for Vogtle versus \$2.2 billion for the V.C. Summer project, and four co-owners involved in underwriting efforts. In August, Georgia Power recommended continuing its Vogtle project assuming future payments from Toshiba, availability of production tax credits, and extension of loan guarantees from [DOE](#). On December 14, Georgia Power and Vogtle co-owners announced that Toshiba fulfilled its guarantee obligation which

eliminated the primary risk of continuing construction. The company recently announced a conditional commitment of approximately \$1.67 billion in additional loan guarantees for the project from [DOE](#) subject to conditions including definitive agreements and regulatory approvals. The [GA PSC](#) is expected to decide on the future of the Vogtle 3 and 4 project as part of the 17th Vogtle Construction Monitoring proceeding on December 21.

### Innovation in Advanced Nuclear Designs Raise Hope for Troubled Industry

While the flop of the V.C. Summer plant could discourage the development of new reactors the industry may gain hope from advanced designs that are simpler and less risky. On November 15, the House Science, Space and Technology Committee approved a bill ([H.R. 4378](#)) that would facilitate the development of next-generation materials and fuels for advanced nuclear reactor technology. On December 7, DOE announced \$30 million for cost-shared projects to develop innovative, industry-driven reactor designs. Among the companies working on such models, Oregon-based NuScale Power submitted the first application for a small modular reactor to federal regulators. In November, the Nuclear Regulatory Commission ([NRC](#)) [issued](#) a regulatory basis document laying out the case for the new rules for small modular reactors (up to 1000 MW) to establish greater regulatory stability, predictability, and clarity in the licensing process.

At the same time, the wave of closures has prompted the [NRC](#) to [consider](#) new rules for decommissioning nuclear plants to make the process more efficient and reduce the need for exemptions from existing regulations. According to EIA, the U.S. has successfully [decommissioned](#) ten commercial nuclear reactors as of November 2017, and another 20 are currently in different stages of the costly and lengthy decommissioning process paid for through a fund that plant operators create during construction.

Amid state and federal actions to help nuclear power plants remain operational in the face of financial pressures, it remains to be seen whether advanced technologies bring a resurgence and expansion. New technologies may slow down the nuclear decline brought by high construction costs, the glut of inexpensive natural gas, and uncertain future demand. However, as long as the market fundamentals stay unfavorable, the outlook on nuclear remains bleak.

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