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Duke Energy Faces Challenges to Its Push for New Natural Gas Plants

Critics cite flaws in the utility's analysis of winter peaks and offer up solar, battery and efficiency alternatives.

JEFF ST. JOHN **MARCH 04, 2021**

Duke Energy's plan to build natural gas plants is being challenged by groups accusing the utility of misrepresenting data to undermine cleaner alternatives.

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Duke Energy's plan to build gigawatts' worth of new natural-gas generators to supply its grid over the next 15 years has already drawn fire from clean-energy advocates who say it violates the utility's long-range decarbonization goals and could leave customers paying for power plants that can't economically compete with cleaner alternatives.

This week, environmental groups, consumer advocates and business organizations raised more opposition in filings with the North Carolina Utilities Commission, saying that Duke misrepresented data about its winter peak electricity needs, as well as the relative cost of power plants versus solar power backed with batteries, to justify this natural gas build-out.

That's reason enough, these groups say, for regulators to demand that Duke rework its plans — and they've laid out their own solar and battery-heavy replacement options for consideration.

Tuesday's filings add new data to longstanding critiques of Duke's integrated resource plan (IRP) for its North and South Carolina utilities Duke Energy Carolinas and Duke Energy Progress. Of the six "pathways" Duke lays out for halving carbon emissions by 2030 and reaching net-zero carbon by 2050, only one would avoid building new natural-gas plants. The rest propose between 6.1 gigawatts and 9.6 gigawatts of new natural-gas capacity.

Duke's IRP states that not building new natural-gas plants could force it to keep coal plants open to maintain grid reliability past its 2030 target for closing them or force it to rely on costly and untested levels of battery-backed renewable energy to supply peak demand. The IRP also notes that the utility is planning a massive build-out of clean energy capacity, including from 8.7 GW to 16.4 GW of new solar and 1 GW to 7.5 GW of new energy storage, depending on each scenario's targeted levels of carbon emissions reduction.

But a filing from the Southern Environmental Law Center (SELC) on behalf of the Natural Resources Defense Council, Sierra Club and Southern Alliance for Clean Energy claims that Duke's analysis is "riddled with inaccurate data, unrealistic assumptions, and flawed methodologies."

That view is backed by a joint filing including the North Carolina Sustainable Energy Association, representing clean energy industries, and the Carolinas Clean Energy Business Alliance, representing businesses advocating for lower-carbon electricity options in Duke's service territory.

Duke Energy spokesperson Meredith Archie said in a Wednesday email that the utility is reviewing the comments and will "evaluate their claims in detail and respond accordingly" by the April 30 deadline for reply comments. Both the North Carolina and South Carolina commissions will need to approve Duke's plan.

"Our IRPs are developed using a comprehensive process that must stand up to regulatory scrutiny, and we are confident in the IRPs and their underlying support," Archie said. A North Carolina Utilities Commission public staff review supported the IRP and recommended that the commission accept Duke's base cases as "reasonable for planning purposes," she added.

Questions over Duke's true winter peak needs

One of the key issues highlighted by Duke's critics is that its IRP appears to have inflated its peak electricity demands and underestimated the amount of resources available to meet its winter loads.

"That's important because Duke's claims about winter peak demand are really increasingly driving the entire IRP," Gudrun Thompson, senior attorney and leader of SELC's Energy Efficiency Program, said in a Wednesday interview. "They're using that as a justification for the plan for this massive gas build-out, and also using this new winter peaking paradigm to undervalue the contribution of solar to the grid at peak times."

A data request from SELC led to Duke submitting corrected figures for those winter peaks, which were used in an independent analysis by Synapse Energy Economics. That analysis

indicates that solar backed with batteries would be able to provide enough capacity to carry the utility through its electric-heating-driven winter peaks without threatening grid reliability, the filing states.

Taking the solar-battery path could also reduce overall system cost by $7.2 billion, out of a range of 15-year costs that Duke has estimated at between $80 billion and $108 billion while reducing carbon dioxide emissions by tens of millions of tons per year, the Synapse analysis found.

Duke also failed to include data about the amount of power it has been able to import from other utilities to provide critical grid reserves during past winter peaks, according to a filing from consumer advocacy group NC WARN and environmental advocacy group Center for Biological Diversity. Failing to include those imports, which Duke intends to rely on in future years, makes the winter peak estimates in its IRP appear more dire than they can be expected to be, according to testimony from Bill Powers, the principal of Powers Engineering and an expert witness contracted by NC WARN.

Duke disclosed data to NC WARN indicating that it chose to rely on imported power instead of tapping about 4 GW of its own resources during a January 2018 winter peak used to justify its need for more natural-gas resources, Powers' testimony added. Those unused resources included nearly 2 gigawatts of natural-gas-fired combustion turbines and nearly 1 gigawatt of demand-side management programs that pay customers to reduce electricity consumption.

Undervaluing carbon-free alternatives

All of these groups agreed in their filings that Duke's IRP appears to undervalue solar power, batteries, demand-side management and energy efficiency as cost-effective alternatives to building new power plants. In particular, a recently concluded "winter peak study" by Duke Energy shows increased potential for demand-side cold-weather options that aren't reflected in its IRP, SELC's filing states.

Powers' testimony for NC WARN also questioned Duke's assertion that capacity from new natural-gas power plants would be three to four times cheaper than the equivalent capacity from battery-backed solar power. Using more recent price data for both sets of resources indicates that the two technologies are roughly equivalent in cost, he stated.

That's not including lower-cost options such as adding batteries to North Carolina's existing installed base of solar, which stands second only to California in terms of megawatts installed, Powers said in a Wednesday interview.

Like many of the U.S. utilities pledging to reach net-zero carbon emissions by 2050, Duke is under pressure to accelerate its shift from fossil-fueled power to cleaner alternatives while also

maintaining a reliable grid. But it's also under pressure from customers to keep costs in check and from shareholders and creditors to maintain profitability.

Other utilities, including Dominion Energy in Virginia, have seen IRPs challenged on similar grounds of overestimating the need for natural-gas power plants to meet future demand and underestimating the value of renewable energy as a substitute. Last year, Duke and Dominion canceled plans to build the Atlantic Coast Pipeline project to expand supply for their power plants and natural-gas distribution businesses, exposing both to multibillion-dollar charges and putting pressure on them to expand capital spending in other parts of their business.

Jim Warren, executive director of NC WARN, noted that Duke's regulated utilities in North and South Carolina earn guaranteed rates of return on capital investments such as new power plants. Growing its share of renewable energy, energy storage and demand-side measures is less lucrative under traditional vertically integrated regulatory structures, although Duke has been allowed to bid its own solar projects against third-party-developed projects in North and South Carolina.

"We've been pointing to Duke's excess capacity for several years now," Warren said. "It's one of the most important things the commission is supposed to do, which is prevent costly overbuilding."