NORTH CAROLINA MUST NOT REPEAT GEORGIA'S NUCLEAR BLUNDER

New Nuclear is a High-Risk Approach to Meeting Electricity Demand

An Assessment for NC WARN
By Bill Powers, P.E.

April 16, 2026

NC WARN

Bill Powers, P.E.

Mr. Powers is a registered professional mechanical engineer with over 40 years of experience in energy and environmental engineering. He has been an expert witness in utility commission proceedings in North Carolina, West Virginia, Missouri, Wisconsin, and California. Mr. Powers has been involved in nuclear plant assessments in New York, Georgia, and California. He is the author of the 2017 strategic energy plan, *North Carolina Clean Path 2025*. Clean Path 2025 describes an alternative pathway for North Carolina relying primarily on local solar and battery storage to achieve the state's clean energy goals.

Mr. Powers has a Bachelor of Science in mechanical engineering from Duke University and an Master of Public Health in environmental sciences from the University of North Carolina at Chapel Hill.

Cover Photo: Google's Googleplex headquarters in California has one of the largest corporate solar power structures in the country. In North Carolina, commercial rooftop solar with adequate battery storage would cost less than one-fifth the installed cost of new nuclear. *Photo courtesy of Solar Power Authority.*

Now in its 38th year, NC WARN is building people power in the climate and energy justice movement to persuade or require Charlotte-based Duke Energy – one of the world's largest climate polluters – to make a quick transition to renewable, affordable power generation and energy efficiency in order to avert climate tipping points and ongoing rate hikes.

ncwarn.org — 919-416-5077 — PO Box 61051, Durham, NC 27715

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Overview by NC WARN

Using mythical data, false assumptions and attempts to magically turn billion-dollar failures into proof that new nuclear reactors might finally be built successfully, Duke Energy is planning the nation's largest expansion of nuclear power. Its executives also are clearly aware of the strong potential that new reactors will meet the same fate as the corporate monopoly's eighteen earlier nuclear project failures.

That's why they quietly insist on nearly full financial protection through federal tax subsidies and monopoly-captive customers' bills. At the earliest, the first of 10 new Duke Energy reactors in the Carolinas would produce power in 2037, far too late to meet the urgent demands of climate scientists to phase-out fossil fuels.

North Carolina leaders should learn the lessons from the recent Westinghouse nuclear debacle in Georgia, which created the most expensive electricity in the US, angered ratepayers and drove elected officials from office. Instead of promoting false climate solutions, Duke Energy should lead North Carolina toward a far cheaper, low-risk, job-creating path of decentralized solar power matched with battery storage as the future backbone of the state's electricity supply.

Duke Energy's Mythical Claims of Unprecedented Electricity Growth

Despite Duke's persistent annual projections of significant growth of electricity usage, its total sales did not increase at all in the Carolinas from 2015 through 2025, even though there are more customers, including scores of data centers. Instead, Duke chooses to ignore these facts and is projecting spectacular growth of electricity needs in the immediate future.

Duke Energy's growth projections are secretive and highly speculative as community resistance to new data centers grows and more efficient technologies emerge. Even during record winter cold spells, when power use is highest, Duke leaves a significant number of power units sitting idle while it seeks authorization to build entire new fleets of power plants.

Duke's new growth forecast is intended to justify a huge and unnecessary buildout of nuclear and gas-fired electricity generation in North Carolina.

Failure-Prone Nuclear Power History in the Carolinas and Georgia

Since the 1970s, Duke Energy and its current subsidiaries have poured $8.9 billion into nuclear projects that were cancelled during the licensing or construction stages or shut down prematurely.

> ***Georgia's top inspector at Vogtle asserts that the enormous AP1000 cost overruns and drawn-out construction timeline would be repeated with any new nuclear project. Duke Energy plans to make that gamble.***

The eighteen project failures included six Westinghouse Advanced Passive 1000 (AP1000) reactors which were attempted between 2005 and 2017. The conditions leading to those failures – design and construction complications leading to delays, soaring costs, low natural gas prices, and flat electricity demand – are no different today than when the projects were cancelled.

In fact, of the fourteen AP1000s attempted in the US by Duke and other private utility monopolies, all but two failed prior to completion. With the two that became operational, Vogtle 3 & 4, Georgia Power reaped more and more profit with every cost overrun and schedule delay. The original estimate was $14 billion and a four-year construction. The final cost was $36 billion with construction lasting 10 years as power users were hit with repeated rate hikes and federal taxpayers put in a $12 billion subsidy.

Georgia's top inspector at Vogtle asserts that the enormous AP1000 cost overruns and drawn-out construction timeline would likely be repeated with any new nuclear project. Duke Energy plans to make that gamble.

Nevertheless, Duke Energy now claims the large AP1000 is a "proven" technology and would meet the "least cost" requirement in the Carolinas. In fact, Duke wants to bet North Carolina's energy and economic future on the most expensive power plants ever built by using the same finance tool that allowed Georgia Power to shift financial risks onto the backs of monopoly-captive customers.

Nothing supports the idea that future AP1000s will cost any less to bring online. No learning curve has been achieved.

Cost overruns and delays while trying to license and build nuclear reactors mean more profit for Duke, while its executives quietly told state regulators that they also must have massive federal subsidies to move forward on their suite of proposed nuclear projects.

"Small" Modular Reactors – The Perpetual R&D Program

Despite a large amount of national promotion about so-called Small Modular Reactors (SMRs), no SMR designs have been built and operated in the US despite more than 20 years of study and billions in taxpayer subsidies. At this point, SMRs are completely experimental, but if ever commercialized in the US, they would be complex, large, and dangerous industrial facilities. Duke apparently realizes it may never attempt SMRs but plans to keep spending millions annually to monitor other utilities' efforts to do so.

There is no evidence to support SMR proponents' claim that construction costs will go down as more SMRs are built. Among the very few SMRs ever attempted, those in China and Russia cost four times more and took four years longer to build than originally estimated.

Power from US SMRs is estimated to cost 50 percent more than kilowatts from the already exorbitantly expensive AP1000s.

There are numerous reasons why new nuclear projects could be cancelled again in midstream, including the need for massive amounts of water to keep plants running.

Reliable Solar is a Faster, Cheaper and Cleaner Path

Duke Energy's claim that nuclear power is the only reliable around-the-clock energy is false. Solar power with ample battery storage is a 24/7 resource with none of the high-risk baggage of nuclear power.

The solar-plus-storage (SPS) solution is readily available to neutralize any data center demand that actually materializes. NC WARN continues to insist that all new energy intensive industries should carry their own electricity weight in the form of onsite SPS.

Commercial rooftop solar with adequate battery storage would cost less than one-fifth the cost of new nuclear. The cost of larger groundmounted SPS systems would be even less. Both solar configurations can typically be installed in under a year.

Duke Energy already produces half its power in the Carolinas at nuclear plants that it plans to operate until 2050 and beyond. With this full-time power backbone, Duke's existing coal- and gas-fired generation can be replaced with reliable SPS, and there is plenty of untapped rooftop, parking lot and urban groundmounted solar potential.

SPS also would be the most flexible and least expensive tool to quickly add new system-wide generation capacity, if needed.

That is why NC WARN has proposed the program "Sharing Solar," a way for all of Duke Energy's customers to share the costs and benefits of clean energy much like they currently pay for polluting power plants. This approach would avoid North Carolina ratepayers being trapped into paying for very expensive and risky nuclear and gas projects that are not needed at all. ■

I. Introduction

Duke Energy's 2025 Carolinas Resource Plan ("Plan") puts strong emphasis on new nuclear power as a pillar of its future electricity supply strategy even as Duke underscores the financial risks of that strategy. The nuclear buildout would consist of large "advanced nuclear" units modeled on an existing but flawed reactor design, the Westinghouse AP1000, and possibly a number of small modular reactors (SMRs). No SMR has yet been commercialized. Duke proposes to have the first 1,117 MW AP1000 online by 2037, and to subsequently add up to ten AP1000 reactors.[1] The first 300 MW SMR would also come online in 2037, with up to three SMRs online by 2039.[2]

Duke Energy asserts these nuclear units are needed, along with a major buildout of gas-fired generation,[3] to address a projected (by Duke) unprecedented increase in electricity demand in the near term spurred by commercial and industrial growth in the state. It says:[4]

> *The Carolinas face new challenges as their economies continue to thrive and attract capital investments at an unprecedented pace. Nuclear energy is essential to power this growth into the future.*

This report examines and refutes the reasons offered by Duke Energy to justify the proposed attempt to buildout nuclear in the Carolinas.

II. Duke Energy's Claim of Rapid Electricity Growth is a Myth

Despite continual annual projections of significant load growth, Duke Energy total electricity sales (retail plus wholesale) did not grow at all, on average, in the Carolinas from 2015 through 2025.[5] (See Figure 1, green bars.) This is despite a Duke Energy Carolinas (DEC) customer growth rate of 17 percent and a Duke Energy Progress (DEP) customer growth rate of 16 percent from 2015 through 2024.[6] In fact, per capita electricity consumption has been on the decline in North Carolina for years.[7] It has also declined at a comparable rate in South Carolina over the same time span.[8] (See Figure 2.) There are more customers in the Carolinas, but they are using less electricity.

Ignoring these facts, Duke is projecting spectacular but illusory demand growth in the immediate future, which it calls the "Advancing Development" load forecast (represented by the red bars in Figure 1).[9] The imagined basis is rapid population and business growth in the Carolinas, especially data center development. The green bars tell the real story. Those drivers have been factors for years, and electricity demand is holding steady.

1 2025 CRP, Chapter 2: Methodology & Key Assumptions, p. 16.
2 Ibid, p. 16.
3 Most of the natural gas used by Duke Energy is produced through hydraulic fracturing. See: Mountain Xpress, Duke Energy's planned power plant tied to fracking, June 30, 2016: https://mountainx.com/news/duke-energys-planned-power-plant-tied-to-fracking/.
4 Ibid, Appendix J: Nuclear, p. 2.
5 2025 CRP, Appendix D: Load Forecast, Tables D-21 and D-22, pp. 21-23 (2015-2024 data); Duke Energy response to NC WARN DR1-22, Docket No. E-100, Sub 207 (2025 data).
6 2025 CRP, Appendix D: Load Forecast, Tables D-3 and Table D-4, pp. 7-8.
7 EIA, North Carolina and South Carolina State Electricity Data, 2015 through 2024, webpage accessed February 7, 2026: https://www.eia.gov/states/NC/data/dashboard/electricity.
8 Ibid, https://www.eia.gov/states/SC/data/dashboard/electricity.
9 2025 CRP, Appendix D: Load Forecast, Table D-19: Total System Net Load by Load Forecast Scenario (GWh), p. 21; 2025 CRP, Chapter 2: Methodology & Key Assumptions, p. 13. "In developing the (2025) Resource Plan, the Companies utilized the Advancing Development Load Forecast as the base planning assumption."

Figure 1. Duke Carolinas (NC and SC) Retail Sales, 2015-2025 and Duke Carolinas "Advancing Development" Base Case Scenario, 2026-2030

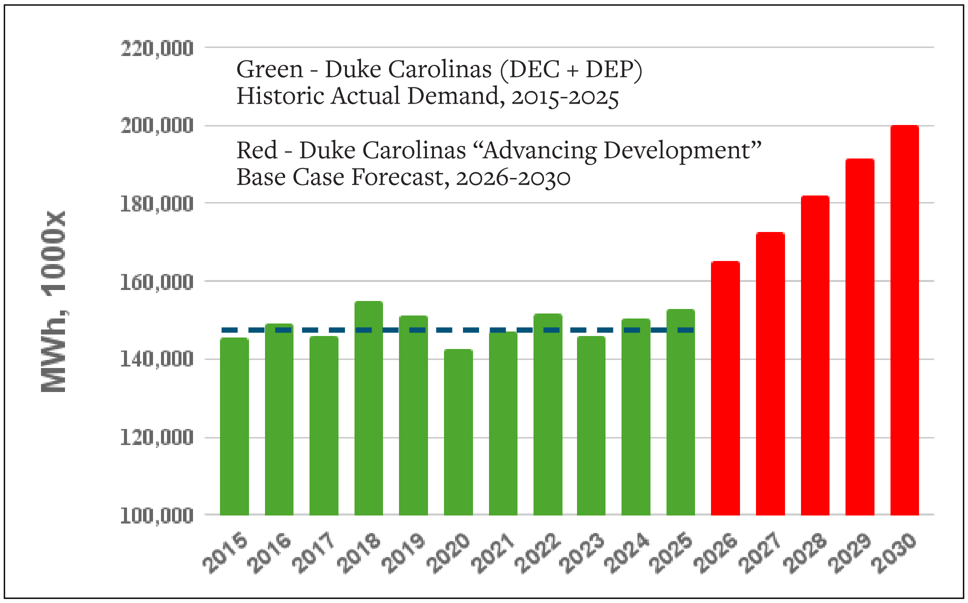
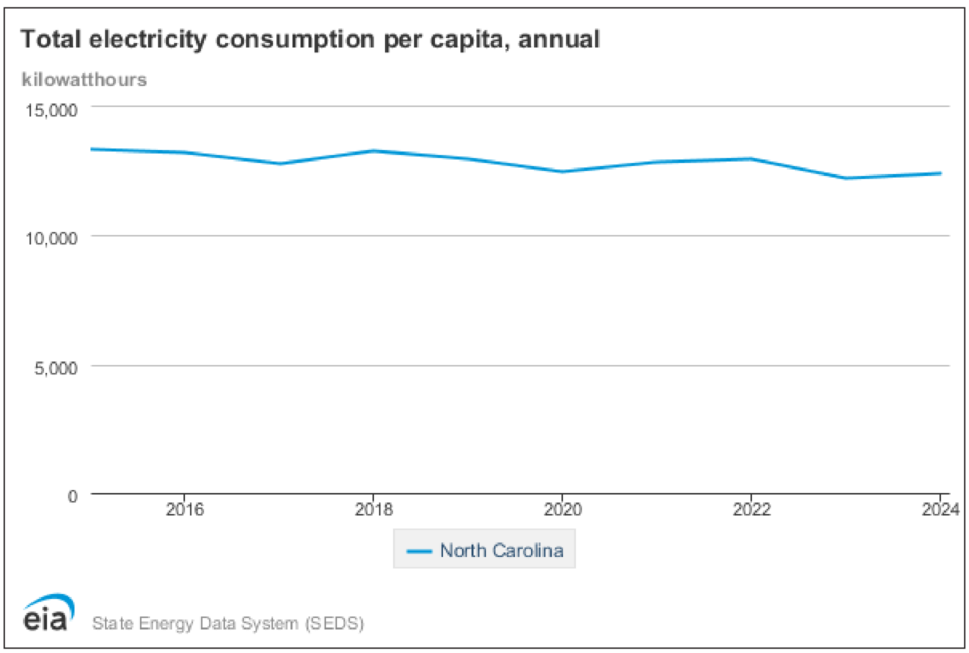


Figure 2. Per Capita Electricity Consumption in North Carolina, 2014-2024



North Carolina already has more than 100 data centers,[10] accounting for 1.9 percent of North Carolina's electricity consumption.[11] South Carolina has 30 data centers accounting for 2.5 percent of the state's electricity consumption.[12] Data centers in North Carolina and South Carolina have not caused net load growth through 2025 as shown in Table 1.

Projections for future data center growth on electricity demand are highly speculative. North Carolina communities are pushing back. Tarboro rejected a proposed 300 MW data center in 2025.[13] Chatham County

10 WFAE, Inside North Carolina's data center boom, October 26, 2025: https://www.wfae.org/show/charlotte-talks-with-mike-collins/2025-10-26/inside-north-carolinas-data-center-boom.
11 CSG South, Data Centers in the South: Trends, Energy Use, and Policy Impacts, November 12, 2025: https://csgsouth.org/data-centers-in-the-south-trends-energy-use-and-policy-impacts/.
12 Ibid.
13 See: https://www.foxbusiness.com/economy/north-caroilna-residents-fight-back-against-massive-tech-project-potentially-coming-their-town

imposed a one-year moratorium on data center development in February 2026.[14] Siting large data centers in North Carolina is becoming more challenging as community resistance grows.

Duke Energy projects electricity demand growing spectacularly at over 5 percent per year from 2026 to 2030, more than 22 percent in just four years, in its base case "Advancing Development" demand forecast. In the press, Duke claims, "customer energy needs over the next 15 years are expected to grow at eight times the growth rate of the prior 15 years."[15] The "Advancing Development" demand forecast is several times greater than Duke's already high forecast of 1.4 percent per year demand growth rate in its 2023 CRP.[16] According to Duke, this is to "account for a load forecasting approach that was not capturing the rapid and unprecedented large customer load growth."[17]

For years, Duke has consistently overestimated load growth. For example, Duke forecast in 2016 that retail demand would reach 130,000 GWh by 2023.[18] In fact, actual retail demand in 2023 was substantially lower at about 120,000 GWh.[19]

Actual demand has fluctuated above and below a flat line over the last decade, as shown in Figure 1. Duke's new turbocharged load growth forecast is clearly wrong. It is unsubstantiated conjecture intended to serve a practical goal – provide some basis for a huge and unnecessary nuclear and gas-fired generation buildout in North Carolina.

Duke Energy typically meets peak winter polar vortex demand with a substantial amount of power imports from neighboring utilities while a significant amount of its existing fleet sits idle. The February 20, 2015 polar vortex winter peak demand of 36,670 MW was similar in magnitude to the new January 27, 2026 winter peak of 37,308 MW (less than 2 percent difference).[20, 21] During the February 20, 2015 winter storm in the Carolinas, Duke had thousands of MW of capacity offline while importing about 5,000 MW of power from neighboring utilities with whom it has agreements to purchase electricity when necessary to meet demand.[22]

Subsequently Duke Energy assured regulators that it had more import options available to meet the February 20, 2015 demand if needed beyond the imported power used. However, Duke does not assume any imports are relied on to meet winter peak demand when calculating its available reserve margin, despite reliance on imports being a standard practice.[23] It assumes only its own generation will be available. This means Duke badly undercounts the magnitude of the reserves available for it to meet record winter peak events. Duke leaves thousands of MWs of capacity idle at the (record) winter peak while it seeks authorization to build entire new fleets of generation.

III. Duke's Failure-Prone Nuclear Power History in the Carolinas

A. Duke's Operational Nuclear Units

More than 50 percent of electricity used by Duke Energy customers in the Carolinas is produced by nuclear power plants coming from 11 operational nuclear reactors at six different sites.[24] These sites, with a total capacity of 10,819 MW, are listed in Table 1.

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14 See: https://www.newsobserver.com/news/politics-government/article314678612.html

15 Charlotte Observer, *Duke Energy wants coal, gas for rising power needs. Clean-energy groups object,* October 3, 2025.

16 2023 CRP, Chapter 2: Methodology and Key Assumptions, Table 2-4: Forecasted Energy Sales – System Obligation at Generator – Combined Carolinas System (DEC/DEP) (GWh), p. 25.

17 2025 CRP, Appendix D: Load Forecast, p. 9.

18 D. Wamsted - Institute for Energy Economics and Financial Analysis, *Key Shortcomings in Duke 's North Carolina IRPs: An Issue-by-Issue Analysis: Part 2*, February 2021, p. 2: https://ieefa.org/wp-content/uploads/2021/02/Key-Shortcomings-in-Duke-North-Carolina-IRPs_Part-2_February-2021.pdf.

19 2025 CRP, Appendix D: Load Forecast, Tables D-21 and D-22, pp. 22-23. Duke's retail sales in 2023 = 120,441 GWh.

20 Duke Energy press release, *Duke Energy serves customers, sets preliminary electric use record in the Carolinas during week of sustained cold temperatures,* January 23, 2025.

21 WFAE, *Duke Energy experiences record-breaking demand during winter storms,* February 6, 2026.

22 W.E. Powers, P.E., Review of Duke Energy Carolinas, LLC and Duke Energy Progress, LLC's 2020 Integrated Resource Plans NCUC Docket No. E-100, Sub 165, pp. 11-18, March 1, 2021.

23 Ibid, pp. 13-15.

24 2025 CRP, Appendix J: Nuclear, pp. 3-6.

Table 1. Operational Duke Energy Nuclear Sites in the Carolinas

Site	Initial Online Date	Number of Units	Capacity (MW)
Robinson	1970	1	759
Oconee	1973	3	2,600
Brunswick	1974	2	1,870
McQuire	1981	2	2,316
Catawba	1983	2	2,310
Harris	1986	1	964
Total:		**11**	**10,819**

B. Safety Problems with the Existing Duke Energy Nuclear Fleet

The US Government Accountability Office (GAO) published an assessment of US nuclear plant exposure to natural hazards in April 2024.[25] All six Duke Energy nuclear plants were identified as "At Risk" sites. The GAO findings are summarized in Table 2.[26]

Table 2. Level of Natural Hazard Risk at Duke Energy Nuclear Plants in the Carolinas

Site	Flood Hazard Level	Storm Surge Risk	Fire Risk
Robinson	High	None	High/Very High
Oconee	High	None	Moderate
Brunswick	High	Category 5 Storm	High/Very High
McQuire	High	None	High/Very High
Catawba	High	None	High/Very High
Harris	High	None	High/Very High

There are ongoing lawsuits by former Duke Energy inspectors, now on administrative leave from the Brunswick nuclear plant near Wilmington and the Catawba nuclear plant near Charlotte, over intimidation by senior management with the intent of softening inspection reports documenting safety and maintenance violations.[27]

Pressure on inspectors to look the other way, on reactors that are already past their original 40-year design life,[28] is occurring as the federal government is directing the Nuclear Regulatory Commission (NRC) to relax safety standards and accelerate new reactor approvals. The president signed four executive orders in May 2025 containing sweeping directives to cut nuclear energy regulations and safety review timelines to rapidly expand domestic nuclear production.[29]

There is also the ongoing challenge of storing radioactive waste onsite indefinitely. A nuclear fuel assembly (bundle of rods) stays in a reactor for about four years to produce heat used to create steam to spin turbine-generators to create electricity. It is considered "used" after this time and no longer suitable for producing electricity.

Used fuel rods must be cooled in concrete pools under 20 feet of water. After seven to ten years in these pools, the used radioactive fuel is typically transferred to steel and concrete containers called "dry casks." The

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25 U.S. GAO, *NUCLEAR POWER PLANTS - NRC Should Take Actions to Fully Consider the Potential Effects of Climate Change,* April 2024: https://www.gao.gov/assets/gao-24-106326.pdf.
26 Ibid, Appendix III: Nuclear Power Plant Exposure to Selected Natural Hazards, p. 57 and p. 59.
27 Port City Daily (Wilmington), *Duke Energy whistleblowers raise nuclear safety concerns amid federal oversight rollbacks,* May 27, 2025: https://portcitydaily.com/latest-news/2025/05/27/duke-energy-whistleblowers-raise-nuclear-safety-concerns-amid-federal-oversight-rollbacks/.
28 NRC, Reactor License Renewal Overview, August 28, 2020:
29 Ibid.

containers are stored onsite at the nuclear plant indefinitely because the industry has never solved the challenge of permanent disposal or safe, long-term management.[30] (See Figure 3.)

Figure 3. Used Radioactive Fuel Pool and Used Radioactive Fuel Dry Casks[31]

All six Duke Energy nuclear sites use fuel pools.[32] Five of the six sites also use dry casks onsite for longer-term radioactive waste management.[33] Only Shearon Harris exclusively uses fuel pools.[34] The quantity of radioactive waste stored onsite continues to grow as the plants generate more and more used fuel.

Onsite storage of used nuclear fuel was not intended to be permanent, and this radioactive waste must be isolated from the public and wildlife for thousands of years. However, it is uncertain if or when a national repository for the dry casks will be established.[35] In the meantime, neither the pools nor the dry casks were designed or secured to withstand acts of malice.[36]

Most operational US nuclear plants have experienced leaks and spills of water contaminated with radioactive tritium, in addition to routine discharges of radioactive materials into the environment.[37, 38] The US also has many retired nuclear reactors undergoing decommissioning.[39] Decommissioning involves removal or decontamination of equipment, structures, and portions of the facility containing radioactive contaminants.[40]

C. The Nuclear Achilles' Heel - Outsized Water Consumption

Most Duke Energy nuclear plants use once-through cooling. These once-through cooled plants, with one exception (Robinson), have more than one reactor and require over 1 billion gallons of cooling water

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30 Duke Energy, Nuclear Information Center - The facts about used nuclear fuel, 2016: https://nuclear.duke-energy.com/2016/10/05/the-facts-about-used-nuclear-fuel.
31 Ibid.
32 Ibid.
33 U.S. Nuclear Waste Technical Review Board, Commercial Spent Nuclear Fuel, Revision 2, January 2022, Figure 4, p. 3: https://www.nwtrb.gov/docs/default-source/facts-sheets/commercial-snf-rev-2.pdf?sfvrsn=18.
34 Ibid, pp. 1-2. "ISFSIs (dry cask storage) are in operation at all reactor sites, including shut down sites, with the exception of the Shearon Harris site."
35 Ibid. Opposition to the Yucca Mountain (NV) deep geologic repository stalled work on a national repository.
36 Congress.gov, Nuclear Power Plant Security and Vulnerabilities, January 2014: https://www.congress.gov/crs-product/RL34331
37 NRC, *List of Leaks and Spills at Operating U.S. Commercial Nuclear Power Plants,* November 15, 2024: https://www.nrc.gov/docs/ML2432/ML24320A014.pdf.
38 NIRS, *Routine Radioactive Releases from Nuclear Reactors,* accessed February 24, 2026: https://www.nirs.org/wp-content/uploads/factsheets/routineradioactivereleases.pdf.
39 U.S. Energy Information Administration, U.S. Nuclear Reactor Shutdown List, webpage accessed February 17, 2026: https://www.eia.gov/nuclear/reactors/shutdown/.
40 U.S. Nuclear Regulatory Commission (NRC), Backgrounder on Decommissioning Nuclear Power Plants, October 17, 2022: https://www.nrc.gov/reading-rm/doc-collections/fact-sheets/decommissioning.

throughput per day. This is equivalent to 20 times the water demand of the City of Raleigh.[41] This means water is drawn from a lake or river, absorbs heat, and the substantially warmer water is then discharged back to the lake or river.

The standard for new nuclear power plants is to use cooling towers instead of once-through cooling. The only "advanced" nuclear capacity to come online in the US to date are AP1000s, Vogtle Units 3 & 4. These units, with a combined capacity of 2,234 MW, are permitted to withdraw up to 74 million gallons per day (MGD) of cooling water from the Savannah River.[42] SMRs would use proportionately less cooling water. For example, a 300 MW SMR would have a cooling tower water withdrawal limit of approximately 10 MGD.

Other existing nuclear plants, such as the single reactor at Shearon Harris, use a cooling tower that evaporates about 17 million gallons per day of cooling water drawn from Harris Lake.[43]

Drought and high ambient temperatures are potential reliability threats to cooling water sources serving Duke's nuclear plants.[44] Drought can reduce lake and river levels below the level of the plant's cooling water intake pipes, necessitating a plant shutdown. High ambient temperatures, especially coupled with drought, can cause an exceedance of permitted intake cooling water temperature limits and force a shutdown.

Duke has come close to shutting down the Shearon Harris reactor in the past when the lake water level has dropped, due to drought conditions, to near the minimum allowable in its operating permit.[45]

High cooling water discharge temperatures can cause a shutdown to avoid excessive harm to marine life. Several nuclear reactors were shut down in Europe in the summer of 2025 due to excessively hot cooling water discharge temperatures.[46]

D. $8.9 Billion Spent on Duke Energy Project Failures

Duke Energy has a poor track record pursuing new nuclear power. The corporation and its former subsidiaries have spent $8.9 billion (in 2025 dollars) on nuclear projects that were cancelled during the licensing or construction stages or shut down prematurely.[47] Two AP1000 twin-reactor projects at the W.S. Lee power plant in South Carolina and the Shearon Harris nuclear plant in North Carolina were cancelled in the design phase despite more than $600 million invested.[48] Duke also failed trying to build another pair of AP1000 reactors in Florida (Levy Nuclear). These are essentially the same AP1000 reactors that Duke is proposing again in its 2025 Plan.

The only actual construction of AP1000 reactors attempted in the Carolinas ended in failure in 2017. South Carolina Electricity & Gas (SCE&G) led a consortium of utilities financing the construction of two AP1000 reactors at the V.C. Summer nuclear plant about 25 miles northwest of Columbia, SC. After years of problems and in the face of opposition from utility partners, with $9 billion spent on a projected cost that had soared to $25 billion, SCE&G was forced to cancel the project.[49] The V.C. Summer AP1000 boneyard is shown in Figure 4. It is only 60 miles from the W.S. Lee power plant, where Duke may attempt to build two new AP1000s.

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41 S&P Global Ratings, Summary: Raleigh, North Carolina; Water/Sewer, October 24, 2019, p. 3. "For fiscal 2019, management reported average daily water demand of 49 mgd."

42 B. Powers, P.E., Vogtle Units 3 and 4: Feasible and Cost-Effective Water Conservation Measures, May 15, 2014.

43 WRAL News, Drought could force nuclear plants to shut down, January 23, 2008.

44 New York Times, Heat shuts down a coastal reactor, August 13, 2012.

45 WRAL, January 23, 2008.

46 New York Times, Extreme Heat Shuts Down Some Nuclear Plants in Europe, July 3, 2025, https://www.nytimes.com/2025/07/03/climate/extreme-heat-nuclear-shutdowns.html.

47 NC WARN letter to Governor Stein, May 20, 2025, p. 2.

48 2025 CRP, Docket No. E-100, Sub 207, Duke Energy Response to NC WARN's Data Request No. 1-35 and 1-36.

49 IEEFA, October 2025, p. 7.

Figure 4. The Cancelled, Partially Built V.C. Summer Nuclear Plant[50]

Photo courtesy of S.C. Governor's Nuclear Advisory Council

E. Pushing Aging Nuclear Units Past Their Original Design Lifetimes

Duke is pursuing 20-year Subsequent License Renewals (SLRs) for all eleven of the reactors in its operational nuclear fleet in the Carolinas.[51] The SLRs will extend the operating lifetime of the Duke nuclear fleet in the Carolinas from an original 40 years to 80 years.[52]

In practical terms this means that all of Duke's existing reactors will still be operational in 2050 barring various safety and financial problems that have already led to a dozen[53, 54] US reactors being mothballed early, including Duke Energy's Crystal River reactor in Florida. It also means these reactors will be operating far longer than the original 40-year design lifetime. It is inevitable that these reactors will see ever-increasing reliability challenges and costs as equipment ages well beyond the original design lifetime. Duke Energy will have its hands full attempting to safely operate this aging nuclear fleet over the next quarter century in an atmosphere of relaxed regulatory oversight.

IV. "Advanced Nuclear" – Same Failed Product with New Catchphrase

A. Duke's History with the AP1000

The Westinghouse Advanced Passive (AP) 1000 reactor has a checkered history in the US. Fourteen AP1000 reactors were proposed between 2007 and 2009.[55] Only two were completed, Georgia Power's Vogtle Units 3 & 4. Three times Duke has proposed AP1000 expansion or "greenfield" (new) projects, at W.S. Lee, Shearon Harris, and Levy (FL), and three times Duke has failed to move any of those AP1000 twin reactor projects into the construction phase. The total cost to customers of Duke's three failed attempts has been approximately $3 billion (in 2025 dollars).[56] The conditions leading to those failures – design complications leading to delays, soaring costs, low natural gas prices, and flat electricity demand[57] – are no different today than when the projects were cancelled.

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50 News & Observer, Opinion: NC lawmakers, don't betray ratepayers by letting utilities charge upfront for plants, June 5, 2025.
51 The first SLR has already been issued for the three Oconee units, in March 2025. See: 2025 CRP, Appendix J: Nuclear, p. 6.
52 2025 CRP, Appendix J: Nuclear, p. 5.
53 Beyond Nuclear, Reactors Are Closing, accessed February 24, 2026: http://archive.beyondnuclear.org/reactors-are-closing/
54 Congress.gov, Financial Challenges of Operating Nuclear Power Plants in the United States, 2016: https://www.congress.gov/crs-product/R44715.
55 Nuclear Regulatory Commission, Combined License (COL) Applications Received, accessed March 28, 2026: https://www.nrc.gov/reactors/new-reactors/large-lwr/col.
56 Ibid. p. 2.
57 Neutron Bytes, *Utilities Pull the Plug on AP1000s at VC Summer*, July 31, 2017: https://neutronbytes.com/2017/07/31/utilities-pull-the-plug-on-ap1000s-at-v-c-summer/.

B. Duke's New AP1000 Tale – "Proven and Least Cost"

Duke Energy now claims large nuclear reactors, specifically the AP1000, are "proven" and "least cost." Neither of these two claims are true. Yet Duke wants to bet North Carolina's energy and economic future on them. Duke points to the two new AP1000 reactors in Georgia, Georgia Power's Vogtle Nuclear Units 3 & 4, to support its claim.

Those two reactors, costing about $36 billion for only 2,200 MW of capacity, are the most expensive power plants ever built.[58] Effectively, Georgia Power demonstrated that if a corporate utility has $12 billion in federal loan guarantees, a state government at its service, a sympathetic regulator, the authorization to turn delays and cost overruns into an ever-growing windfall of profits, and no spending cap, it can complete an AP1000 expansion project in the Southeast.

The only nuclear winners in Georgia were the power plant owners, Georgia Power and Southern Company. Historically, investor-owned utilities like Georgia Power cannot begin collecting from ratepayers for infrastructure projects like a power plant until the plant is operational, also known as "used and useful." However, Georgia passed a law in 2008 allowing Georgia Power to get paid for "construction work in progress" (CWIP), and make a guaranteed profit on those payments, as Vogtle 3 & 4 were built.

The financial motivation to work efficiently and stay on budget was gone with the CWIP payments and absence of a spending cap. In fact, Georgia Power reaped more and more profit with every cost overrun and every schedule delay. The original cost estimate was $14 billion with construction to be completed in 4 years.[59] The final cost was $36 billion with construction completion in 10 years.[60] This financial hit to Georgians was a bonanza for Georgia Power.

This same finance tool has now been made available to Duke Energy in North Carolina by the passage of Senate Bill 266 in July 2025. This bill, which, among other things, authorizes CWIP for development and financing costs for new baseload power projects, sets the table for a repeat of the V.C. Summer (SC) and Vogtle 3 & 4 (GA) AP1000 financial debacles. Construction finance costs, which can become a substantial component of overall project costs, can be collected from ratepayers even if a facility is never built.[61] Governor Josh Stein astutely vetoed SB 266. However, the state legislature overrode the veto. Immediate collection of CWIP is also potentially available to Duke if it is "necessary to the financial stability of the utility."[62] Cost overruns and delays will now mean more profit for Duke.

US Department of Energy (DOE) loan guarantees also protected Georgia Power from paying a price in the financial markets for the cost overruns and delay. The $12 billion in DOE loan guarantees – federal taxpayer dollars – insulated Georgia Power from what would otherwise have been reticent lenders.[63] Duke's Carolinas Resource Plan underscores that the DOE's Clean Energy Loan Guarantee Program, which includes nuclear projects, has $62 billion remaining in new loan capacity.[64] Duke makes clear that it plans to tap into that pot of loan guarantee money to reduce its financial exposure from its suite of proposed nuclear projects.

Staff at the Georgia utility regulator called for the Vogtle project to be abandoned in 2017 and for the state to cut its losses after about $15 billion had been spent.[65, 66] The Georgia regulatory commission's lead in-

58 D. Schlissel, *IEEFA, SMRs, Carbon Capture: The Wrong Resources for Colorado's Energy Transition, October 2025,* p. 7.
59 D. Schlissel, CO Proceeding No. 24A-0442E, April 18, 2025, p. 44.
60 Ibid, p. 44.
61 EPRI, Program on Technology Innovation: A Comparison of Capital Costs Between Large Light Water Reactors and Small Modular Reactors— Considering the Impact of Financing Costs, August 2023, p. 4.
62 Traditionally, a utility cannot charge ratepayers for a new power plant until it is "used and useful". There is however an exception when immediate recovery of CWIP is "in the public interest and necessary to the financial stability of the utility in question" [NCGS 62-133(b)(1)(a)].
63 DOE, *Pathways to Commercial Liftoff: Advanced Nuclear,* September 2024, p. 30.
64 2025 CRP, Appendix J, p. 22. Additionally, proposed new loan authority is included in the fiscal year 2026 budget (not appropriated) of up to $30 billion specifically for nuclear, grid infrastructure, and firm power.
65 EPRI, Program on Technology Innovation: A Comparison of Capital Costs Between Large Light Water Reactors and Small Modular Reactors— Considering the Impact of Financing Costs, August 2023, p. 4.
66 South Carolina actually did take that action in 2017, halting work at $9 billion spent on the V.C. Summer nuclear plant expansion.

spector at Vogtle 3 & 4, who was onsite for years, asserts that the enormous AP1000 cost overruns and drawn-out construction timeline would be repeated with any new nuclear project.[67] With the current Plan, the next new AP1000 nuclear project in the US is likely to be attempted by Duke Energy.

C. Backlash in Georgia Over the Cost of Vogtle 3 & 4

Georgia customers are angry at the major rate increases, 24%, levied to cover construction costs when Vogtle 3 & 4 went into service in 2023 and 2024.[68] These customers are dismissing with the vote the complacent (elected) regulators that saw Georgia Power as their client to serve, not regulate.[69]

The story in Georgia is not about "proven" nuclear power. It is not a success story. It is about all the intractable problems with new nuclear power causing political upheaval as customers (aka "voters") get the outrageous bill. It is about cozy relationships between the regulated utility and the regulator. The Vogtle debacle amounted to little more than a profit-making machine for Georgia Power and its parent Southern Company. The people of Georgia are waking up.

The DOE is not. In its *Pathways to Commercial Liftoff: Advanced Nuclear*,[70] DOE asserts that "Many of Vogtle's biggest challenges (e.g., incomplete design, immature supply chain, untrained workforce) were solved for the AP1000 during construction (of Units 3 & 4)." In fact, none of Vogtle's biggest challenges were solved during construction. Vogtle's biggest challenges and failures were simply laid bare. They will inevitably be repeated on the next AP1000 project.

V. Small Modular Reactors – The Perpetual R&D Program

No small modular reactor (SMR) designs currently marketed in the US have been built and operated despite more than 20 years of study and billions of taxpayer subsidies. They are, at this point, completely experimental. Duke Energy realizes it may never attempt SMRs but plans to keep spending millions annually to monitor other utilities' efforts to do so. It will do this by implementing what it calls a "second mover" approach[71] – waiting for "first of a kind" SMR designs to mature and spending substantial amounts of ratepayer money monitoring the situation in the meantime.

SMRs will also be much more expensive to build than large nuclear reactors, if any are ever constructed. The DOE now projects that SMRs will be about 50 percent more costly on a per kilowatt basis than large reactors like the AP1000.[72] Corporations attempting to develop SMRs generally avoid talking about the industry's actual experience with cost and schedule overruns. They instead offer unproven claims about SMRs.

These *unproven* claims include:[73]

- Building multiple copies of the same SMR design will lead to cost declines over time—what is generally called a "positive learning curve."
- Because they will be modular and mass produced in factories, SMRs will be much less expensive to build than existing large reactors and will take substantially less time to build.

At that time, the "cost to complete" was estimated at $25 billion. The Summer expansion, two AP1000 nuclear units, was the same scope as what became the $36 billion Vogtle 3 & 4 expansion project.

67 Power Magazine, *What Was Learned from Building New Nuclear Reactors?,* April 1, 2025: https://www.powermag.com/what-was-learned-from-building-new-nuclear-reactors/.

68 Macon Telegraph, Were rate hikes, Vogtle to blame for Georgia Power customers' service disconnections?, March 25, 2025, accessed March 18, 2026: https://www.macon.com/news/environment/article301776774.html

69 Note that Georgia PSC commissioners are elected and had all been Republicans for the two decades prior to November 2025. They had typically resigned prior to the end of their last term so the governor could appoint a replacement who then has the advantage of incumbency at the next election. Source: Truth About Vogtle (report), May 2024: https://truthaboutvogtle.com/wp-content/uploads/2025/02/Vogtle-Truth-Report-2025.pdf

70 DOE, *Pathways to Commercial Liftoff: Advanced Nuclear,* September 2024, p. 26.

71 2025 CRP, Appendix J: Nuclear, pp. 26.

72 DOE. Figure 23, p. 27.

73 D. Schlissel - IEEFA, *SMRs, Carbon Capture: The Wrong Resources for Colorado's Energy Transition,* October 2025, p. 7.

- SMRs will be effective tools for addressing climate change and will be able to complement variable renewable resources on the grid.

These claims are wrong. There are no existing factories where the modules for proposed SMRs are being fabricated. SMR proponents frequently claim that construction costs and time will go down as more reactors with the same design are built. This is called a positive learning curve. However, this is an assumption by SMR proponents. There is no evidence to support the claim.

Any positive learning curve achieved in building SMRs will depend on how many of each design are built. There are 127 SMR designs being either considered or marketed worldwide. This makes it very uncertain how many of each design might someday be constructed.[74]

SMRs currently operating in China cost four times more to build than original estimates and took 12 years to construct, which is three to four times longer than planned. The final cost of the two SMRs in Russia was five times more than projected and took 13 years to build, more than four times longer than planned.[75]

When Westinghouse was marketing the AP1000 reactor design, which was built over-budget and behind-schedule at Vogtle and cancelled during construction at V.C. Summer, it cited almost the same claims that SMR proponents make now: There would be significant benefits from the reactors' new design and from the use of "modern modular construction techniques."

These projects ran into serious problems with both modular construction and the use of factory-built modules. The source of the biggest delays was the AP1000's novel design and the challenges created by the untested approach to manufacturing and building reactors.[76] These problems ultimately led to the bankruptcy of Westinghouse in 2017.[77]

These cost and construction concerns also play into another problem for SMRs: They will not be compatible with renewable energy resources. Their projected high cost will force operators to run them as much as possible, aiming for capacity factors above 90%.[78]

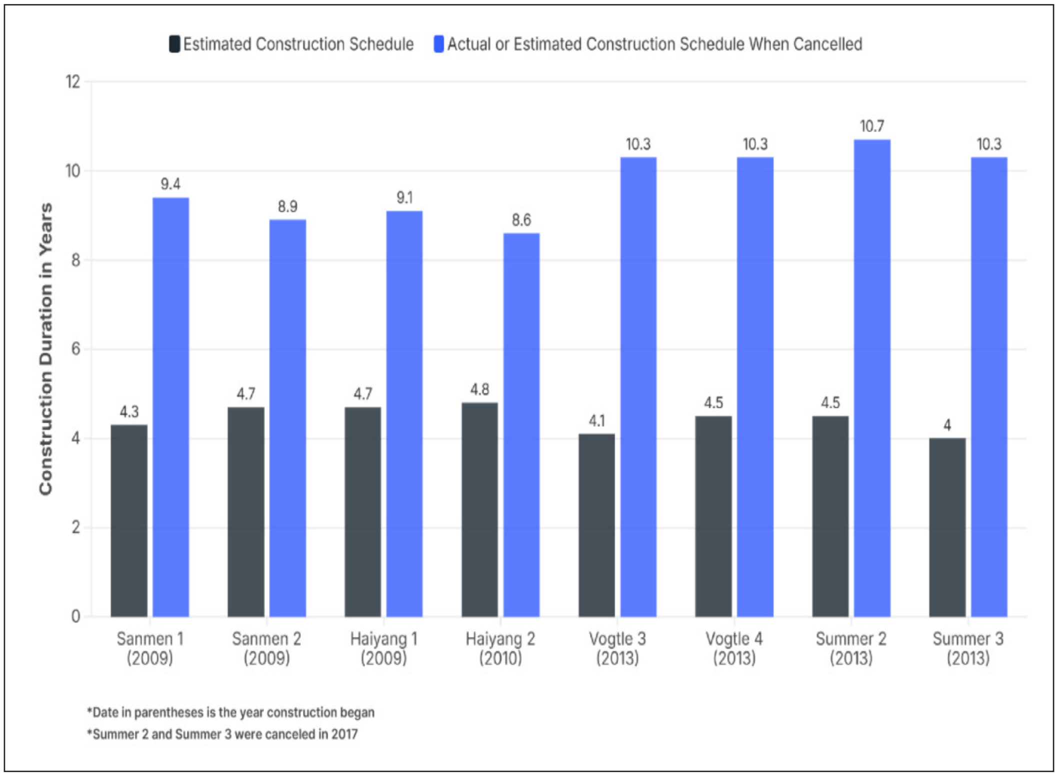
The cost of electricity from SMRs is projected to be four to six times greater than the cost of a solar-plus-storage (SPS) alternative.[79]

VI. New Nuclear Costs are Astonishingly High and Construction Timelines Remarkably Long — And They Will Not Change

Duke Energy and the DOE claim Vogtle 3 & 4 were "First Of A Kind – FOAK" AP1000 units, and that costs and construction timelines will decline substantially as subsequent units are built. This is not accurate. As noted, Vogtle 3 & 4 cost $36 billion to build. No facts establish that future AP1000s will cost any less to bring online. No learning curve, meaning shorter construction times as more units are built, has been achieved with the AP1000.[80] Vogtle 3 & 4 are the fifth and sixth AP1000 units to come online worldwide. The manufacturer, Westinghouse, was intimately involved in the construction of each unit and gained manufacturing and construction insights at each site. It did not matter. Construction of the sixth AP1000, Vogtle 4, took longer than construction of the FOAK AP1000 unit (Sanmen 1), as shown in Figure 5.

74 Ibid, p. 13.
75 Ibid, p. 13.
76 Ibid, p. 14.
77 Georgia Power press release, Georgia Power will move forward with Vogtle 3 & 4 project, December 21, 2017: https://www.southernnuclear.com/news-center/farley/ga-power-vogtle.html.
78 IEEFA, p. 15.
79 Ibid, p. 17, Figure 6: Comparative Costs of Power From an SMR and Renewable Resources.
80 D. Schlissel, CO Proceeding No. 24A-0442E, April 18, 2025, p. 52. "It is difficult to compare construction costs between reactors built in different countries, due to different commodity prices, labor costs, currency conversion rates, and accounting practices."

Figure 5. No Decline in Construction Timeline for Subsequent AP1000 Units[81]



Nuclear costs have never significantly declined, no matter how many reactors are built.

The French built 58 nuclear reactors from the early 1970s to 2000 using a standard Westinghouse reactor design and highly coordinated reactor manufacturing and construction.[82] The backbone of France's electricity supply is nuclear power. Despite this, the reactor construction costs and timelines remained relatively stable (accounting for inflation) in the first phase of the program using a standard reactor design (1971-1986).

Costs steadily and substantially increased as new reactor designs were deployed in the second and final phase of the program (1979-1999).[83] There was no learning curve that reduced construction costs and timelines as more reactors were built. Based on the decades-long French experience, there are no apparent economies-of-scale in nuclear power plant cost or construction timeline.

The French reactor program was highly standardized. Yet standardization and a steady stream of projects over decades did not result in lower costs or faster construction.[84]

VII. Authorizing $440 Million for Nuclear Planning is Misguided

The North Carolina Utilities Commission (NCUC) authorized Duke Energy to spend $440 million on nuclear technology assessment, planning, and applications for new nuclear sites through 2026.[85] This is a "cart before the horse" action that starts North Carolina down a high-risk nuclear road when much lower cost, no-risk alternatives, specifically SPS, are at hand and can be scaled-up quickly.

Duke proposes to spend over half of the $440 million ($276 million) in 2027 and 2028. $130 million of this amount will be spent on front-end design for the first nuclear site. Another $100 million will be spent updating the AP1000 Combined Operating Licenses (COLs) at W.S. Lee and Shearon Harris. Duke may also opt to or-

81 D. Schlissel – IEEFA, SMRs, Carbon Capture: The Wrong Resources for Colorado's Energy Transition, October 2025, p. 11.
82 A. Grubler, *The French Pressurised Water Reactor Programme,* 2013, p. 146.
83 Ibid. Table 11.1, p. 149.
84 Ibid, Table 11.1, p. 149.
85 North Carolina Utilities Commission, Order Accepting Stipulation, Granting Partial Waiver of Commission Rule R8-60a(D)(4), and Providing Further Direction for Future Planning, Docket No. E-100, Sub 190, pp. 127, November 1, 2024.

der long-lead equipment for the first nuclear project in the 2027-2028 timeframe. According to Duke, that will require a substantial addition to the $440 million budget authorization.[86]

Committing nearly half a billion dollars to advance nuclear power in North Carolina creates a situation where so much effort will have been invested in advancing specific nuclear projects that they gain their own momentum, despite the obvious risks to ratepayers, electricity affordability and public safety.

VIII. There is a Faster, Cheaper Pathway that is Clean

North Carolina was among the nation's leading states in solar power expansion a decade ago. The state could have continued to advance toward this clean and safe energy future had the political will to do so carried the day. This better future would avoid massive nuclear cost overruns, more nuclear waste, more greenhouse gas emissions, and angry ratepayers paying far too much for massive power plants that are not needed. No new fossil or nuclear power plants should be built. North Carolina can get back on the right path. That path is decentralized solar and battery storage as a major component of the North Carolina energy supply.

Duke Energy's claim that nuclear power is the only reliable 24/7 clean energy is false.[87] Solar with ample battery storage is a 24/7 resource with none of the risk of new nuclear power,[88] and it is also well adapted to serve as an intermediate and peaking power resource.

A solar array only produces power during daylight hours, with production peaking in the mid-day hours. As a result, in North Carolina, the solar production over 24 hours is much less than the peak mid-day production. For example, a 1 MW solar array will produce on average about 4 MWh of electricity over a 24-hour period. If that solar array is paired with 4 hours of battery storage at the rated solar capacity of 1 MW, or 4 hr x 1 MW = 4 MWh of battery storage, the batteries will be adequate to entirely capture the solar production for the average day and discharge that stored power in a controlled, dispatchable manner through the day and night. This is how SPS can serve as a baseload resource.

Vogtle Units 3 & 4 cost $36 billion and took 10 years to construct. The combined output of Vogtle Units 3 & 4 is 2,200 MW. The installed cost of this nuclear capacity is $16,400 per kilowatt (kW).[89]

By comparison, commercial rooftop SPS, with four hours of battery storage at the rated capacity of the solar array, would cost less than $3,000 per kW in current dollars,[90] less than one-fifth the installed cost of Vogtle Units 3 & 4. The installed cost of larger groundmounted SPS systems would be about $2,000 per kW in current dollars.[91] The SPS system could also be installed in a year or less, a small fraction of the time necessary to bring a nuclear unit online.[92, 93]

Duke proposes to build up to ten new 1,100 MW AP1000 units by 2050.[94] As noted, the most recent actual installed cost for new nuclear, Vogtle 3 & 4, was $16,400 per kW. The total cost for 11,000 MW of new nuclear power would be $180 billion at the cost of the Vogtle units.[95]

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86 2025 CRP, App J, pp. 30-31.

87 Ibid, Chapter 4: Execution Plan, p. 21.

88 Also, Duke has an abundance of existing gas-fired resources that can fill any gaps over the next quarter century of a solar and battery storage buildout without the addition of new nuclear resources.

89 $36 billion ÷2,200,000 kW = $16,400/kW.

90 Cost of commercial rooftop solar array: Woods Mackenzie/SEIA, *US Solar Market Insight – Executive Summary Q4 2025,* December 2025, p. 15 ($1,710/kWdc Q3 2025); Cost of battery storage: Energy Storage News, *BNEF: Bigger cell sizes, 5MWh containers among major BESS cost reduction drivers,* January 30, 2025. "In 2024, the global average price of turnkey energy storage systems fell to US$165/kWh." Assume 2026 US installed cost of $250 per kW-hour, or $1,000 per four kWh of installed battery storage capacity.

91 Ibid, p. 15. Utility-scale fixed tilt groundmounted solar = $1,160/kWdc Q3 2025.

92 SolarTech, Step-by-Step Breakdown of a Commercial Solar Project, webpage accessed March 29, 2023. "After a contract is signed, it takes approximately 7-10 months to complete the project."

93 Nexamp, Solar Farms: Comprehensive Guide to Large-Scale Solar Energy Solutions, webpage accessed January 7, 2026: https://www.nexamp.com/blog/solar-farms.

94 2025 CRP, Chapter 2: Methodology & Key Assumptions, p. 16; 2025 CRP, Docket No. E-100, Sub 207, Duke response to NC WARN DR1-38.

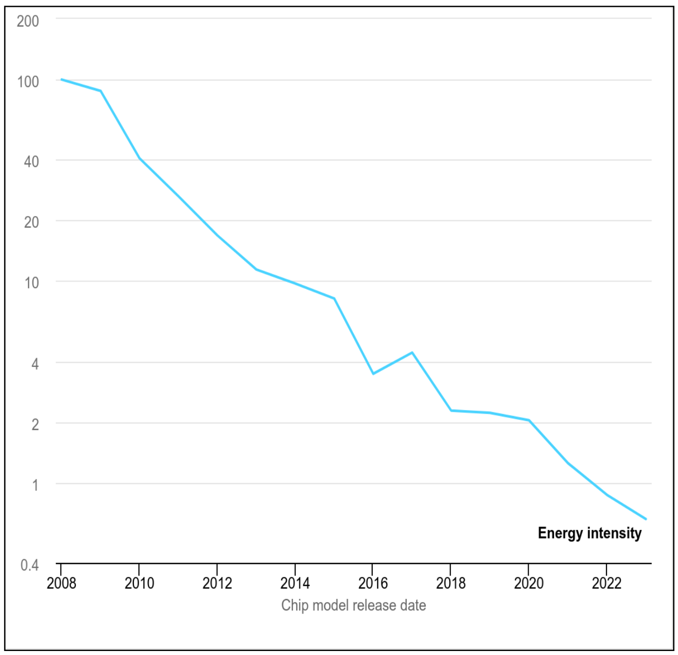
95 11,000 MW x $16.4 million per MW = $180.4 billion.

Duke also proposes to build 12,300 MW of new gas generation by 2040.[96] The installed cost of new gas generation is about $2,500 per kW.[97] The total cost for new gas generation would be over $30 billion.[98] The total estimated cost of Duke's advanced nuclear and gas generation buildout is $210 billion. This would allow Duke to sidetrack any new clean energy projects as it would be fully invested in building these large, high-risk power plants.

A. Data Centers Should Use Onsite Solar-Plus-Storage

Duke has dramatically overstated demand growth compared to reality. Many data centers are being proposed that may never materialize, and there is potential for double counting as developers promote the same project in multiple utility jurisdictions.[99] Data centers' demand forecasts are highly speculative and do not account for AI processor energy efficiency gains in the near future. The energy demand of AI processor chips decreased 100x between 2008 and 2023, as shown in Figure 6.[100] These efficiency gains dramatically reduced data center electricity demand.[101] The data center boom may also be long gone by 2037, Duke's proposed startup date for the first of its proposed new nuclear units.

Figure 6. Efficiency Improvement of AI Related Computer Chips, 2008-2023



Note: Vertical axis is an energy usage factor with a 2008 start year.

Onsite SPS is especially useful for meeting data center load, as it can be deployed quickly to provide cost-effective onsite generation.[102] This approach is already being implemented. Google plans to co-locate renewable energy and

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96 2025 CRP, Executive Summary, Figure 8, p. 13. By 2040 – 4,100 MW of combustion turbines (CT), and 8,200 MW of combined cycle (CC).

97 Norton Rose Fulbright, Project Finance NewsWire - *The Shift Back to Gas*, August 1, 2025, "It is important to know the configuration when talking about gas-fired generation. If it is one combustion turbine, one HRSG and one steam turbine, the cost is $2,200 to $2,500 per kilowatt of installed capacity. That is in today's dollars (2025)."

98 12,300 MW x $2.500/kW x 1,000 kW per MW = $30.75 billion.

99 Canary Media, *Data-center power forecasts climb to unreachable heights: Utilities expect electricity growth to reach levels that are hard to fathom — and they're using those estimates to justify costly new investments in fossil gas,* November 18, 2025: https://www.canarymedia.com/articles/data-centers/data-center-power-forecasts-climb-to-unreachable-heights.

100 International Energy Agency, *What the data centre and Al boom could mean for the energy sector,* October 18, 2024: https://www.iea.org/commentaries/what-the-data-centre-and-ai-boom-could-mean-for-the-energy-sector.

101 Canary Media, *Utilities are flying blind on data center demand. That's a big problem.: How can utilities plan grid and power plant investments for the AI and data center boom when forecasts are so speculative? Some effective strategies are emerging,* February 25, 2025: https://www.canarymedia.com/articles/utilities/utilities-are-flying-blind-on-data-center-demand-thats-a-big-problem.

102 Utility Dive, *Energy Meets Urgency: Solving the Data Center Power Problem with Solar,* September 4, 2025: available at https://www.utilitydive.com/news/data-center-power-problem-solar/758809/ ("Behind-the-meter solar installations, designed to power data

storage resources to directly power its data centers and minimize new load on the grid.[103] North Carolina ratepayers should not be forced to foot the bill for a nuclear and gas generation buildout based on speculation and hype.

Instead, new energy-intensive industries, specifically AI data centers, should manage their own electricity usage in the form of onsite SPS to minimize the imposition of new loads on the grid and associated rate impacts to other customers. The onsite SPS solution is readily available to neutralize any data center demand that materializes. In addition, these SPS systems should be funded by the data center developers themselves, not ratepayers. Onsite solar power serving a data center is shown in Figure 7.

Figure 7. Rooftop Solar Serving a Data Center[104]

B. Duke's Existing Nuclear Fleet is the 24/7 Baseload Anchor

Duke's nuclear fleet produced approximately 90 million MWh of power in 2024.[105] This is approximately 60 percent of the 150 million MWh of combined DEC and DEP retail and wholesale electricity sales in 2024.[106] This is a robust foundation of 24/7 baseload power. Another approximately 10 percent is existing non-fossil power: solar, hydroelectric, wind, and wood.[107]

Duke is in the process of extending the operating lifetimes of its entire fleet of nuclear plants.[108] These supplemental 20-year extensions, on top of earlier 20-year extensions, mean all existing Duke nuclear units will be operational into the 2050s. Over 10,000 MW of its existing 10,819 MW nuclear fleet will be online through 2053, and most of this capacity will be online until 2055.[109]

SPS would supplement this baseload nuclear power and existing non-fossil power. SPS would operate as baseload,

centers directly rather than feed the grid, can be constructed in just a few months once permits are in hand. Battery storage adds flexibility and resilience, especially when designed to smooth out demand or provide backup during peak hours. And because these systems often avoid long interconnection queues, the timeline from development to operation is shorter than nearly any other power source.").

103 Canary Media, Google plans to build gigawatts of clean power and data centers together, December 10, 2024: https://www.canarymedia.com/articles/clean-energy/google-has-a-20b-plan-to-build-data-centers-and-clean-power-together.

104 Google's solar-powered data centre in Saint-Ghislain, Belgium.Copyright Google, website accessed February 19, 2026: https://news.cnrs.fr/opinions/greening-data-centres.

105 2025 CRP, Appendix J – Nuclear, p. 1. Capacity factor in 2024 was 94.8%. Therefore, 2024 production = 10,819 MW x 0.948 x 8,760 hr = 89,846,169 MWh.

106 Ibid, Appendix D, Tables D-21 and D-22, p. 22.

107 EIA Form 861, North Carolina Electricity Profile 2024, November 10, 2025. Table 5. Electric power industry generation by primary energy source, 1990 through 2024.This includes "must take" Qualifying Facility power primary from solar independent power producers.

108 2025 CRP, Appendix J - Nuclear, pp. 5-7.

109 Ibid, Figure J-3, p. 7.

intermediate, and peaking power in the years leading to 2050. The "gap" to be filled by SPS, and currently provided by coal and gas-fired generation, is approximately 50 million MWh. SPS would replace existing coal- and gas-fired generation, and displace any proposed new gas-fired and nuclear power.

C. Solar Potential Can Fill the Gap in North Carolina

North Carolina has a rooftop solar potential of over 100,000 MW, capable of producing more than 140 million MWh of electricity annually.[110] Commercial parking lot solar has a potential of about 40 million MWh per year.[111] Finally, the National Renewable Energy Laboratory (NREL) estimated the urban groundmounted solar potential of North Carolina at 68 million MWh per year.[112] Collectively, the rooftop, parking lot, and urban groundmounted solar resource potential in North Carolina exceeds 240 million MWh per year. Local SPS is a largely untapped resource that can quickly begin displacing power generated by burning fossil fuels.

Duke proposes to spend $63 billion on new capital investments in DEC and DEP territories from 2026 through 2030.[113] How much SPS with four hours of battery storage could be built at current SPS prices with a budget of $63 billion? More than 25,000 MW, equivalent to more than 30 million MWh per year of production, assuming an even split between commercial rooftop SPS and larger groundmounted SPS.[114]

This calculation assumes all of the SPS capacity is financed by Duke, put in the rate base, and paid by all customers, consistent with NC WARN's Sharing Solar proposal.[115] However, an SPS tariff that incentivizes customers to make the investment themselves would reduce the SPS costs put in the rate base and borne by all Duke customers.

IX. Conclusion

Attempting to build new nuclear power plants is the wrong road. It is a road littered with many past failures and lessons not learned. It is too costly and has too many downsides. North Carolina has been fortunate to have avoided a major nuclear public safety event to date. As the lead onsite Georgia Public Service Commission inspector during construction of Vogtle 3 & 4 recognized:[116]

> *More than 15 years after the Plant Vogtle expansion project first was licensed, the enormous cost overruns, the prolonged construction timeline, and the significant burden on ratepayers in Georgia reveal that nuclear reactor technologies cannot be relied on as a cost-effective solution to our growing energy needs, as the evidence points to more affordable, faster, and readily available near-term alternatives.*

North Carolinians continue to use less and less electricity, doing their part to limit demand growth.[117] They should be encouraged and incentivized, at the residential, commercial, and industrial levels, to cover their own electricity needs with SPS. That is why NC WARN proposed "Sharing Solar," a way for all of Duke Energy's customers to share

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110 Google Project Sunroof, North Carolina, accessed March 21, 2026: https://sunroof.withgoogle.com/data-explorer/place/ChIJgRo4_MQfVIgRGa4i6fUwP6o/. Total rooftop potential: 112,000 MWdc, 142 million MWh. Unit solar production = 1,270 MWh/yr per MWdc of solar.

111 Assumptions (1) 2.5 parking spaces per passenger vehicle (WSJ, *America has too much parking. Really.*, April 2, 2023), 2) ~8 million passenger vehicles in North Carolina [US DOT, *State Highway Travel - North Carolina*, 2023 (9.1 million vehicles); NHTSA, *Traffic Safety Fact - 2023 Data*, May 2025 (92% of registered vehicles are passenger vehicles)]; therefore ~20 million parking spaces, standard 9 ft x 18 ft each, assume 20 Wdc per ft2, therefore 3.2 kWdc solar potential each space, 64,000 MWac total potential, assume 50% usable (due to shading, site issues, etc), therefore 32,000 MWdc usable. Assume 1,270 MWh/yr production per MWdc of capacity (Google Project Sunroof), therefore potential parking lot production = 32,000 MWdc x 1,270 MWh/MWdc/yr = 40.6 million MWh/yr.

112 NREL, *U.S. Renewable Energy Technical Potentials: A GIS-Based Analysis*, 2012, Table 2, p. 10.

113 Duke Energy, Q4 2025 Earnings Review and Business Update, February 10, 2026, p. 42. Combined DEC + DEP five-year capital expenditure = $63 billion.

114 $63 billion ÷ [($3 million/MW + $2 million/MW) ÷2] = 25,200 MW.

115 NC WARN, *Moving North Carolina Forward: The Case for Local Solar-Plus-Storage*, May 23, 2023: https://www.ncwarn.org/wp-content/uploads/MovingNC-Forward.pdf; See also: NC WARN, *Sharing Solar: A Sweeping Climate Proposal* (webpage accessed March 21, 2026): https://www.ncwarn.org/our-work/sharing-solar/.

116 Power Magazine, *What Was Learned from Building New Nuclear Reactors?*, April 1, 2025: https://www.powermag.com/what-was-learned-from-building-new-nuclear-reactors/.

117 See Figure 2.

the costs and benefits of clean, “no risk” energy much like they currently pay for polluting power plants.[118]

It would be far more prudent to build clean, less expensive capacity, in the form of solar and dispatchable battery storage facilities, which can be added without long lead times.[119, 120] SPS provides maximum flexibility to meet an increase in demand *if it materializes.*

North Carolina should move forward on a new path that phases out fossil fuels, reduces financial risk, and avoids having ratepayers trapped paying for very expensive nuclear and gas projects to provide generation capacity that may not be needed at all. ■

118 Under “Sharing Solar,” the SPS systems would be owned by Duke and rate based. This is the same financing mechanism used by Duke to recover costs and profit from fossil generation and nuclear projects.
119 DOE, *Pathways to Commercial Liftoff: Advanced Nuclear,* September 2024, p. 58: “A common concern of the US nuclear supply chain for all reactor design generations involves manufacturing capacity and capability for large components.”
120 Ibid, p. 26: The completion of Units 3 & 4 made Vogtle the largest energy generation site in the US. Many of Vogtle’s biggest challenges (e.g., incomplete design, immature supply chain, untrained workforce) were solved for the AP1000 during construction; see 3.b.i for more. Despite the advantages, large reactors have proven difficult to construct in a manner that reaches NOAK cost given megaproject issues and a proliferation of different designs. P. 70: see Section 3.b.i “Lessons learned from Vogtle”.