Pew

July 11, 2025

Joel Porter
Energy Security Manager/Program Analyst II
Department of Environmental Quality, State Energy Office
217 W. Jones St.
Raleigh, NC 27603

RE: 2025 North Carolina Draft Energy Security Plan

Dear Mr. Porter:

The Pew Charitable Trusts' Energy Modernization Project appreciates the opportunity to comment on the North Carolina Department of Environmental Quality State Energy Office's Draft 2025 North Carolina Energy Security Plan. Pew's Energy Modernization Project works to advance policies that modernize the electric grid and accelerate the adoption of both large-scale and distributed clean energy generation. We applaud the Energy Office for the development of this comprehensive draft energy security plan, which aims to enable secure and reliable energy generation and distribution across the state. Pew offers the following comments in support of the important role that distributed energy resources and advanced transmission technologies, such as Grid Enhancing Technologies and advanced conductors, can play in supporting North Carolina's growing energy needs and economy.

I. Building a Resilient Energy System

In sections 8.2.1 and 8.2.3, the draft plan highlights the potential to leverage backup generation and microgrids in times of need or when grid services are disrupted. Clean distributed energy resources, like solar and storage systems, can ensure reliable power and grid stability as the threat of more frequent extreme weather events loom.

Microgrids can further improve customer energy reliability and provide resilience benefits by having the capacity to island during times of interrupted power or

extreme weather events. As noted in the draft plan, North Carolina faces increasing risk from hurricanes. Distributed energy resources, which can be configured as microgrids and operate independently from the larger utility grid, will be increasingly important in ensuring critical services and communities have power during extreme weather events or other system outages. The value of microgrids was underscored by Duke Energy's microgrid project in Hot Springs that provided 143.5 hours of power to the town in the aftermath of Hurricane Helene.

Pew urges North Carolina state leaders to support the development of more microgrid projects, and consider useful policy and funding models from other states. For example, the Colorado legislature passed a bill in 2022 that required the state's energy office to develop a roadmap to increase deployment of microgrids and to explore how microgrids can provide grid reliability and resilience benefits during extreme weather events.[1] As another example, this year the Texas legislature allocated $1.8 billion for microgrid development to enhance resiliency among the state's 31,000 critical facilities.[2]

II. Improving Transmission and Distribution Efficiency

According to the energy consulting firm ICF, energy demand in the U.S. is projected to increase 25% by 2030.[3] And In North Carolina there is an estimated backlog of 13.6 GW of energy in the interconnection queue waiting to connect to the grid.[4] With aging transmission infrastructure unable to accommodate this backlog, we appreciate that the draft plan highlights different strategies underway to get more out of existing transmission infrastructure and acknowledges that an enhanced transmission system will help bring more renewable energy onto the grid (section 8.2.2). Specifically, the draft plan calls attention to Grid Enhancing

[1] Colorado General Assembly, Electric Grid Resilience and Reliability Roadmap, HB22-1249 (2022), https://leg.colorado.gov/bills/hb22-1249.

[2] Lisa Cohn, "With New Microgrid Funding, Texas Seeks to Avoid the Devastation of Storms Like Winter Storm Uri," *Microgrid Knowledge*, June 16, 2025, https://www.microgridknowledge.com/policy/article/55297233/with-new-microgrid-funding-texas-seeks-to-avoid-the-devastation-of-storms-like-winter-storm-uri.

[3] Lalit Batra et al, Rising current: America's growing electricity demand, 2025, https://www.icf.com/insights/energy/demand-growth-challenges-opportunities-utilities.

[4] John D. Wilson, Zach Zimmerman, and Rob Gramlich, "Strategic Industries Surging: Driving Us Power Demand" December 2024), https://gridstrategiesllc.com/wp-content/uploads/National-Load-Growth-Report-2024.pdf.; "U.S. County Map of North Carolina Interconnection Requests, 1995-2025," Steven Zhang and Chris Talley, Interconnection.fyi, June 30, 2025, https://www.interconnection.fyi/?state=NC.

Technologies (GETs) as a solution to increase the capacity of transmission lines and we agree that utilities should consider adopting these cost-effective solutions to relieve grid constraints, reduce costly congestion, and save money for residents and businesses. In addition to the technologies mentioned in the plan—dynamic line rating systems and advanced power flow controls—another common GET is topology optimization, which allows grid operators to reroute power flows to avoid congested areas.

Advanced or high-performance conductors are another technology that would allow grid operators to increase capacity from existing grid infrastructure. Advanced conductors are made with carbon fiber or composite core materials, encapsulated by aluminum, which makes them stronger, more efficient, and able to carry 50% to 110% more power than conventional wires that have a steel core.[5] Pew is encouraged by Duke Energy's partnership with the State Energy Office to implement an advanced conductor project to help manage growing electricity demands and reliability in eastern North Carolina.[6]

GETs and advanced conductors are particularly appealing near-term solutions to enhance grid capacity because they can be deployed on existing transmission infrastructure generally within three months to three years,[7] as opposed to new high-voltage transmission lines that can take up to ten years on average to be developed.[8] And because these technologies allow for the more effective operation of the transmission system, it could free up additional capacity so more clean energy generation resources could come online.

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[5] Emilia Chojkiewicz et al., "2035 and Beyond: Reconductoring with Advanced Conductors Can Accelerate the Rapid Transmission Expansion Required for a Clean Grid," GridLab, 2024, https://www.2035report.com/wp-content/uploads/2024/06/GridLab_2035-Reconductoring-Technical-Report.pdf.

[6] North Carolina Department of Environmental Quality, "Electric Grid Resilience,"https://www.deq.nc.gov/energy-climate/state-energy-office/inflation-reduction-act/electric-grid-resilience#AnticipatedOutcomesandBenefits-15407.

[7] Louise White et al., "Pathways to Commercial Liftoff: Innovative Grid Deployment," U.S. Department of Energy, 2024, https://liftoff.energy.gov/wp-content/uploads/2024/04/Liftoff_Innovative-Grid-Deployment_Final_4.15.pdf.

[8] Michelle Solomon, "DOE Study Highlights America's Transmission Needs, but How Do We Accelerate Buildout?," *Utility Dive*, March 31 2023, https://www.utilitydive.com/news/doe-study-transmission-clean-energy/646589/.

States across the country are increasingly adopting policies to promote the use of GETs and advanced conductors for the benefit of their electric ratepayers, including both Virginia (HB 862 & HB 1822) and South Carolina (HB 3309). In North Carolina, Duke Energy is currently required to provide information on its use of GETs to the North Carolina Utilities Commission. Duke Energy's 2025 Carbon Plan-Integrated Resource Plan filing to the Commission must include: (1) a description of GETs that have been deployed on Duke's systems; (2) a description of GETs under development; (3) a summary of the costs and benefits of GETs that Duke has already deployed and are under development; and (4) an explanation of Duke's decision to not implement any GETs that it evaluated. Bipartisan legislation was introduced in the North Carolina General Assembly this year (HB 814) that would codify the Carbon Plan reporting requirements for GETs and also include advanced conductors.

Pew also commends the draft plan's acknowledgement that long-term transmission planning and investments will continue to play a critical role in transforming the state's electric grid. In addition to considering new transmission projects, North Carolina's transmission planning processes should evaluate complementary investments in nearer term solutions like GETs and advanced conductors.

III. Meeting Growing Energy Demand

As North Carolina's economy continues to grow, Pew commends the draft plan's emphasis on new renewable energy as a means to meet growing energy needs. A diverse set of clean energy resources will be key in meeting the state's greenhouse gas reduction goals while maintaining economic growth and energy affordability.

Specifically, in section 8.2.5 the draft plan mentions onshore wind as a key renewable energy resource, and state leaders should continue to consider the important role offshore wind can play in cost-effectively meeting growing energy needs. In 2021, Governor Roy Cooper signed an executive order which set a goal for the state to develop 2.8 GW of offshore wind by 2030.[9] Additionally, Duke

[9] Governor Roy Cooper, Advancing North Carolina's Economic and Clean Energy Future with Offshore Wind, Executive Order No. 218 (2021), https://governor.nc.gov/documents/files/executive-order-no-218/open.

Energy has acknowledged the role offshore wind can play in meeting growing energy demand in their most recent Carbon Plan Integrated Resource Plan, which includes 2.4 GW of offshore wind by 2035.[10] There are three federally designated offshore wind lease areas in North Carolina, which if built out, could supply the state with cost-effective electricity while contributing to the state's economy through the associated offshore wind supply chain development.

In addition to new utility-scale clean energy generation, the state should look to distributed energy resources, such as customer-sited batteries and smart thermostats, to help meet growing energy demands. The comprehensive assessment in section 8.3 of demand side management strategies and programs reflects the many opportunities available for residential, commercial, and industrial customers to reduce energy consumption, lower their carbon footprint, and their electric bills. Utilities have the opportunity to build upon these legacy demand response programs to also include virtual power plants (VPPs).

The draft plan highlights the benefits that VPPs can provide by unlocking deeper integration of renewables, demand flexibility, and cost savings for customers. VPPs are aggregations of distributed energy resources that grid operators dispatch to help balance electricity supply and demand. Notable examples of VPP programs across the country include Green Mountain Power's Bring Your Own Device program in Vermont and National Grid's ConnectedSolutions program in Massachusetts. States like Massachusetts are leveraging VPPs to cost-effectively manage their growing energy demand. On the heels of a 2008 Massachusetts clean energy package that was signed into law and requires the state's investor-owned utilities to develop three-year plans that achieve cost-effective efficiency and demand reduction targets, some utilities looked to VPP programs as a potential solution. A decade later, as a part of their three-year plan, National Grid introduced their VPP program which launched within four months and now provides the utility with 250 MW of peak shaving benefits.[11]

[10] State of North Carolina Utilities Commission, DOCKET NO. E-100, SUB 190, 2024, https://starw1.ncuc.gov/NCUC/ViewFile.aspx?Id=cfc6d586-12e4-447f-a552-757d6e73c30e.
[11] Jennifer Downing et al., "Pathways to Commercial Liftoff: Virtual Power Plants," U.S. Department of Energy, 2023, https://liftoff.energy.gov/vpp/.

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North Carolina can build upon the success of VPP programs across the country to meet the growing energy needs of the state. In North Carolina, Duke Energy's pilot VPP program, PowerPair, provides up-front incentives for customers to install solar and storage systems and compensates them on an ongoing basis for allowing Duke Energy to dispatch the batteries when needed to meet peak demand. We encourage the state to support scaling this VPP offering to more customers, more customer classes, and evaluate VPPs as cost-effective resources in the utilities' resource planning processes alongside traditional generation resources.

We appreciate the opportunity to provide these comments and look forward to future stakeholder discussions as the State Energy Office finalizes and works to build on the state's Energy Security Plan. We are available to answer any questions or engage in future dialogue as requested.

Sincerely,

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