NORTH CAROLINA
PUBLIC STAFF
UTILITIES COMMISSION

June 12, 2024

Ms. A. Shonta Dunston, Chief Clerk
North Carolina Utilities Commission
4325 Mail Service Center
Raleigh, North Carolina 27699-4300

Re: Docket No. E-100, Sub 190
Biennial Consolidated Carbon Plan and Integrated Resource Plans of Duke Energy Carolinas, LLC, and Duke Energy Progress LLC, Pursuant to N.C.G.S. § 62-110.9 and § 62-110.1(c)

Dear Ms. Dunston:

Attached hereto, pursuant to the Commission's January 17, 2024 *Order Scheduling Public Hearings, Establishing Interventions and Testimony due Dates and Discovery Guidelines, Requiring Public Notice, and Providing Direction Regarding Duke's Supplemental Modeling* and June 10, 2024 *Order Granting Extension of Time to File Technical Conference Presentation Materials*, are the Public Staff's presentation materials for the June 17, 2024 technical conference on Duke Energy Carolinas, LLC's and Duke Energy Progress, LLC's 2023 Biennial Consolidated Carbon Plan and Integrated Resource Plans.

By copy of this letter, I am forwarding a copy to all parties of record by electronic delivery.

Sincerely,

Electronically submitted

/s/ Nadia L. Luhr
Staff Attorney
nadia.luhr@psncuc.nc.gov

Attachment

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Public Staff

North Carolina Utilities Commission

June 17, 2024 Technical Conference
2023 Carbon Plan and Integrated Resource Plan
Docket No. E-100, Sub 190

Presenters:

Dustin R. Metz – Manager, Electric Section – Operations and Planning, Energy Division

Jeff Thomas – Engineer, Energy Division

THE PUBLIC STAFF'S KEY TAKEAWAYS

- Duke should pursue interim compliance by 2034.
  - Duke and Public Staff modeling suggests that interim compliance by 2030 or 2032 requires interconnection of *unreasonable* quantities of new resources.
- The Public Staff's near-term action plan (NTAP) includes higher targets for solar, onshore wind, and advanced nuclear, and a more cautious approach on natural gas.
- Duke should implement measures to increase interconnection capacity, with a particular focus on solar plus storage and standalone storage.
- Duke's proposed near-term development activities for long-lead time resources are generally reasonable.
- The offshore wind ARFI should be better defined, with a reasonable path to advancing development.

Supporting testimony: Metz, Thomas

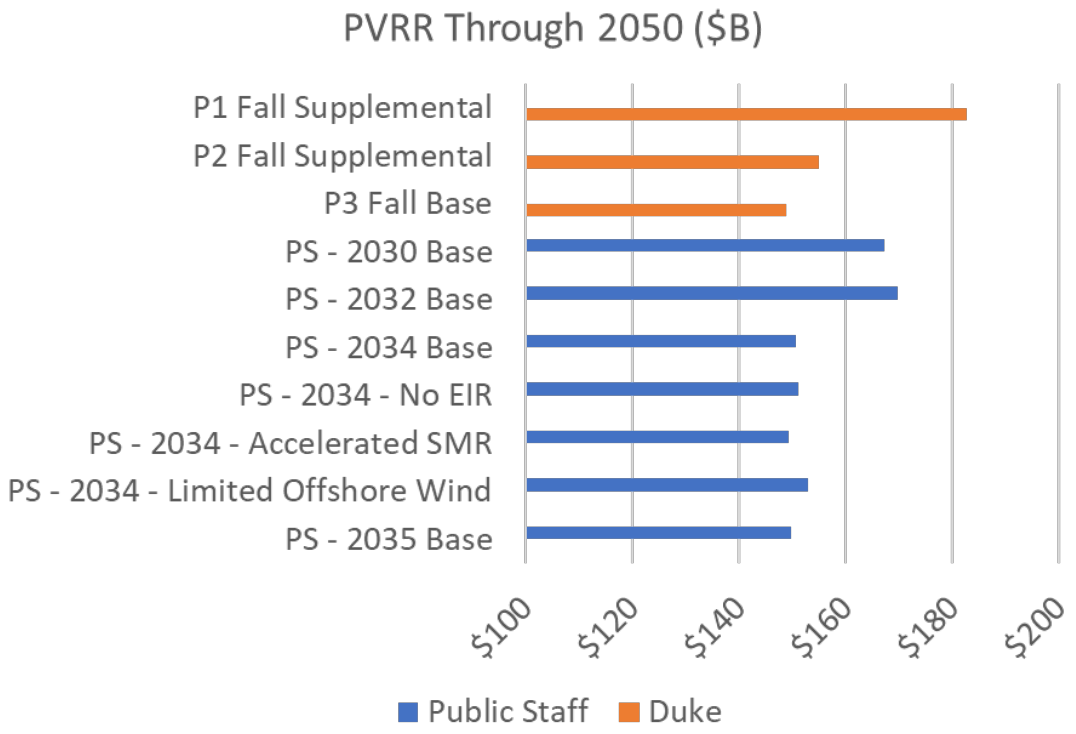
The Public Staff's Near-Term Action Plan

- The Public Staff's NTAP includes higher targets for solar, onshore wind, and advanced nuclear, and a more cautious approach on natural gas.
  - Future solar procurements should seek higher levels of solar plus storage relative to Duke's NTAP.
  - Natural gas risks include new EPA emission rules and stranded assets.
- Beyond the NTAP horizon, higher levels of cost-effective clean generation and energy storage, and additional natural gas, may be needed.

	Duke NTAP		Public Staff NTAP	
Technology	**MW Target**	**Year**	**MW Target**	**Year**
Solar	6,460	2031	6,700	2031
Battery Storage	2,700	2031	2,700	2031
Onshore Wind	1,200	2033	1,800	2033
Combustion Turbines	1,700	2032	849	2030
Combined Cycle	6,800	2033	1,359	2030
Pumped Storage Hydro	1,834	2034	1,834	2034
Advanced Nuclear	600	2035	1,200	2036
Offshore Wind	2,400	2034	2,200	2034-2035

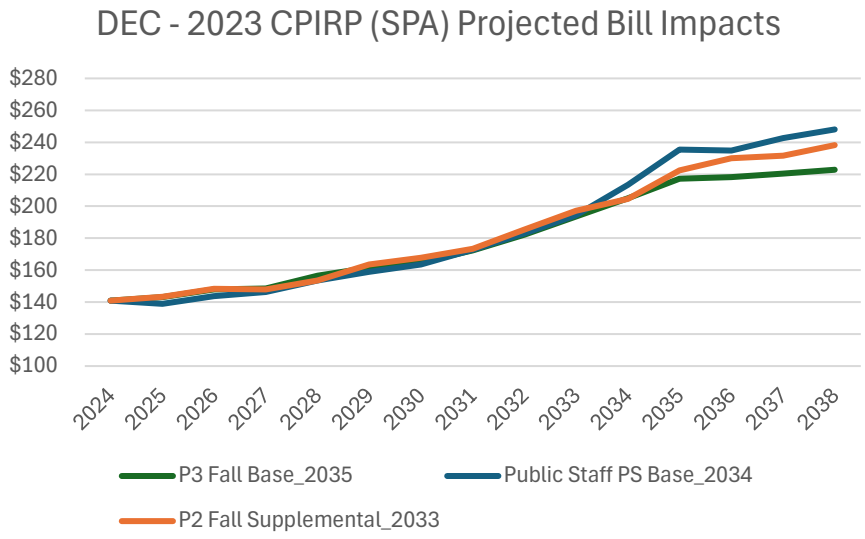
Portfolio Costs

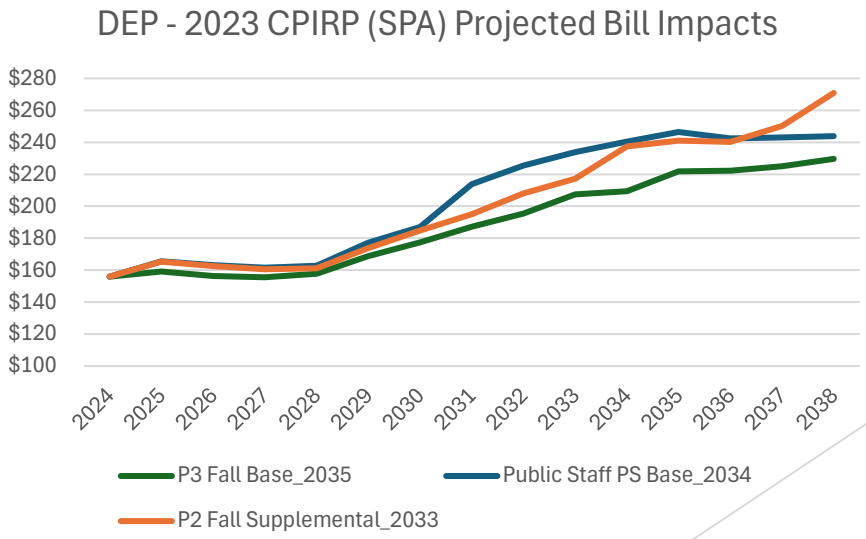
- PVRR (present value of revenue requirement) is a measure of the total capital outlays for generation and transmission, as well as operating costs and tax credits.
  - Does not capture all costs (e.g., distribution, existing facility O&M, certain transmission upgrades).
- Public Staff and Duke portfolios tend to converge between $145 and $170 billion, depending on resource availability assumptions and interim compliance year.
- Interim compliance year is one of the largest drivers of PVRR differences; compliance by 2032 or earlier has a significant cost premium relative to 2034.



Portfolio Costs, cont.

- Estimates of retail customer bill impacts are based on annual revenue requirements and customer sales.
  - PS Base 2034 portfolio is similar to Duke's P2 and P3 SPA, with significant variance beginning in the early 2030s.
  - Over the longer term (through 2050), PVRRs converge, and customer bills beyond 2038 may similarly converge.





Supporting testimony: Thomas, Metz, Lawrence

Recommendations for Mitigating Bill Impacts

- Duke should seek to maximize the benefits of the Energy Infrastructure Reinvestment (EIR) loan program. Aggressively seeking EIR funds could lead to increased renewable and storage deployment and could save ratepayers more than $400 million through 2032.
- Duke should pursue creative interconnection solutions to reduce overall transmission costs (e.g., repowering distribution-level solar facilities and pursuing surplus interconnection requests for solar and battery projects at fossil sites).
- Duke should continue to evaluate proactive transmission solutions to resolve current and future reliability concerns (e.g., planning holistic transmission projects and leveraging economies of scale and synergies from multiple projects.
- Cost-effective projects that can resolve reliability issues or enable timely interconnection of needed resources should be pursued through regional transmission planning forums (CTPC and SERTP).
- If the Commission selects offshore wind, the Commission and Duke should consider cost recovery structures that share the risk of cost overruns.

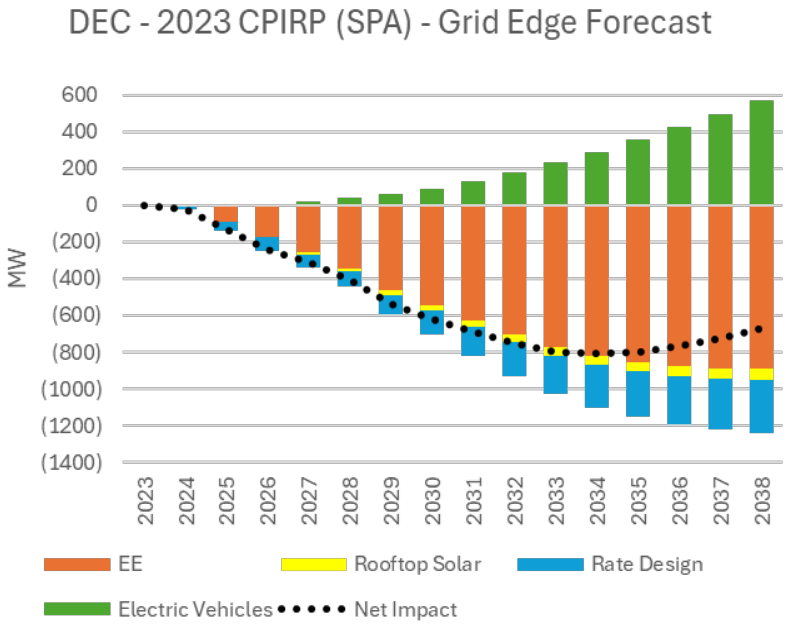
Supporting testimony: Hinton & Fahey, Thomas

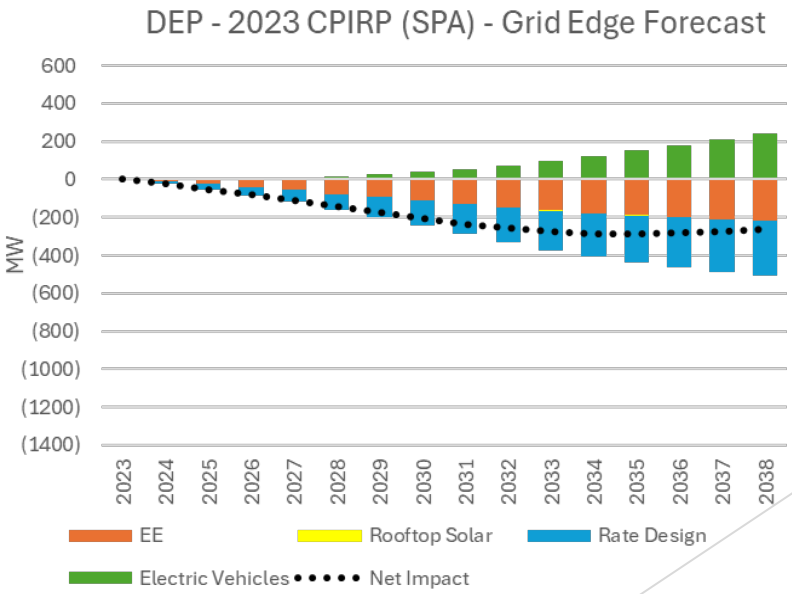
Load Forecast

- Rapid development of new industries such as data centers and EV manufacturing, partly driven by federal and state programs.
- The addition of large prospective customer loads to the Companies' traditional "organic load forecast" is a significant departure from previous forecast methodologies.
  - An April update to the large customer load forecast showed significant load changes, particularly in DEP.
  - Concerns regarding "double counting" of load.
- An alternate forecast, developed by the Public Staff as a sensitivity, completely removes the effects of "double counting."
- The Public Staff recommends that Duke: (1) monitor their own and other large load growth areas; (2) update the Commission of changes to large customer load in its territories; and (3) use probabilistic models if future large load additions are added to the econometric model.

Grid Edge

- Generally, the Public Staff supports the Grid Edge forecast, which includes:
  - Rooftop Solar/Net Metering
  - Electric Vehicles
  - Rate Tariffs
  - Energy Efficiency
  - Demand-Side Management
- The Public Staff recommends that:
  - Duke consider new DSM programs and model them in future CPIRPs.
  - Duke begin developing a non-residential PowerPair program.





Supporting testimony: Williamson, Lawrence, Thomas

Supporting testimony: Michna, Metz

Natural Gas, Hydrogen, and Coal

- The need for additional gas generation was validated in Public Staff modeling.
  - Due to fuel supply and cost risk, new EPA rules, stranded asset risk, and load materialization risk, the Public Staff recommends proceeding with an evaluation of the first 3 CC units to come online between 2028 and 2031.
  - It is premature and inconsistent with the 2022 Carbon Plan Order to model a CC unit in South Carolina.
- Duke should be required in its 2025 CPIRP filing to:
  - Provide specific costs, electric load, and technology to be utilized for hydrogen production, transportation, and storage (at least as a modeling sensitivity).
  - Model carbon emissions and tax credits to be utilized to generate hydrogen supply.
- Duke should be required in each future CPIRP proceeding to provide an updated coal retirement evaluation and to continuously re-evaluate its “repair vs. retire” analysis.
  - Public Staff used P3 Fall Base coal retirement dates in its modeling.
  - New EPA rules create uncertainty around DEP coal plant retirements.

Recently Finalized EPA Rules Under the CAA

- Any natural gas combustion turbine that initiates construction after May 2023 and operates above 40% capacity factor must have a greenhouse gas mitigation plan that reduces emissions by 90%.
  - Litigation is ongoing, and Duke and South Carolina are parties to a lawsuit seeking a stay.
  - The Best System of Emission Reduction (BSER) as determined by the EPA is carbon capture and sequestration, which is currently believed to be geologically infeasible in North Carolina.
- Natural gas units that operate below 40% annual capacity factor are expected to be constructed with the most efficient technology currently available and to utilize low emission fuels.
- Duke has not presented a compliance plan in its CPIRP or its pending natural gas CPCN applications.

Closing Remarks

- The Public Staff's recommended 2034 interim compliance date and NTAP seek to balance least cost planning, grid reliability, and execution risk, while striving to meet the interim compliance target as soon as practicable.
- Duke must take reasonable steps, while also moving aggressively on new resources, in both the near- and long-term, to ensure a reliable grid and compliance with carbon reduction statutes.
- Planning for carbon neutrality in the face of significant uncertainty will require frequent adjustments and refinements, some of which will need to take place outside of the two-year CPIRP cycle.

Appendix A
Public Staff Witnesses

- Dustin Metz – Near-term Action Plan, Execution Risk, Nuclear, Transmission, Natural Gas and Hydrogen, Reliability
- Jeff Thomas – Overview, Interim Compliance Date, Modeling, Bad Creek II
- Evan Lawrence – Onshore and Offshore Wind, Electric Vehicle load forecast
- David Williamson – EE / DSM, Bill Impacts
- Blaise Michna – Natural Gas and Coal
- Bob Hinton & Patrick Fahey – Load Forecast
- Jordan Nader – EPA Rules for Existing Coal and New Natural Gas generators
- Michelle Boswell – Request for Relief and Energy Infrastructure Reinvestment Program funding

Appendix B
Public Staff Modeling

- The Public Staff tested numerous sensitivities based on interim compliance date, resource availability, project financing, and new EPA rules.
  - While there is variance between resource selection based on these different assumptions, there are resources that should be pursued as part of a least-regrets pathway.
- Acceleration of future carbon-free resources, such as offshore wind and new nuclear, may result in lower portfolio costs.
  - Delaying such projects increases the risk of losing access to federal tax credits under the Inflation Reduction Act. Natural gas is a necessary resource to meet load and maintain system reliability while pursuing an orderly retirement of coal and is economically selected in all Public Staff model runs.
  - However, new EPA rules and uncertainty around the materialization rate of new economic development projects presents significant risk of over-reliance on natural gas combined cycle units.