

STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. E-100, SUB 190

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of Biennial	)	SUPPLEMENTAL DIRECT
Consolidated Carbon Plan and Integrated	)	TESTIMONY OF KENDAL C.
Resource Plans of Duke Energy Carolinas,	)	BOWMAN ON BEHALF OF
LLC, and Duke Energy Progress, LLC,	)	DUKE ENERGY CAROLINAS,
Pursuant to N.C.G.S. § 62-110.9 and § 62-	)	LLC AND DUKE ENERGY
110.1(c)	)	PROGRESS, LLC
	)	

1 **Q. MS. BOWMAN, PLEASE STATE YOUR NAME, BUSINESS ADDRESS**
2 **AND POSITION WITH DUKE ENERGY CORPORATION.**

3 A. My name is Kendal C. Bowman, and my business address is 410 South
4 Wilmington Street, Raleigh, North Carolina, 27601. I am the North Carolina
5 President for Duke Energy Carolinas, LLC (“DEC”) and Duke Energy Progress,
6 LLC (“DEP” and together with DEC, “Duke Energy” or the “Companies”).

7 **Q. ARE YOU THE SAME KENDAL C. BOWMAN THAT FILED DIRECT**
8 **TESTIMONY IN THIS CASE?**

9 A. Yes.

10 **Q. ARE YOU SPONSORING ANY EXHIBITS?**

11 A. Yes. I am sponsoring two supplemental exhibits, which update and replace the
12 two exhibits that I initially filed with my direct testimony. Bowman
13 Supplemental Direct Exhibit 1 presents the Companies’ updated Requests for
14 Relief from the Commission as requested in the Companies’ Amended Verified
15 Petition for Commission approval of the Companies’ 2023–2024 Carbon Plan
16 and Integrated Resource Plan (“CPIRP”) Update as filed with the Commission
17 simultaneously with this testimony. Bowman Supplemental Direct Exhibit 2
18 presents the Companies’ updated CPIRP near-term action plan (“NTAP”) as
19 informed by the Companies’ supplemental modeling and additional portfolio
20 analysis (“Supplemental Planning Analysis”) performed using the Companies’
21 Updated 2023 Fall Load Forecast, which reflects the impacts of the continued

1 economic development success in the Carolinas occurring subsequent to
2 preparation of the initial CPIRP filing.

3 **Q. MS. BOWMAN, WHAT IS THE PURPOSE OF THIS SUPPLEMENTAL**
4 **TESTIMONY?**

5 A. The purpose of this supplemental testimony is to introduce the Supplemental
6 Planning Analysis and sponsor the additions to the NTAP resulting from the
7 Supplemental Planning Analysis. The IRP and Near-Term Actions Panel
8 sponsors the Supplemental Planning Analysis and provides additional
9 information and support for the Companies' proposed updates to the NTAP.

10 As background, in my direct testimony, I explained that the CPIRP
11 presents the Companies' long-term integrated resource plan and near-term
12 actions for execution that will provide for the continuation of reliable service to
13 meet the growing electricity needs of the Companies' customers and satisfy the
14 carbon emission reduction targets and energy transition objectives of N.C.G.S.
15 § 62-110.9 and Session Law 2021-165 ("HB 951"). In our August 2023
16 Carolinas Resource Plan (the "Resource Plan" or the "Plan") filings, the
17 Companies requested that the Commission select the resources identified in the
18 Companies' NTAP and approve the near-term supply-side development and
19 procurement activities identified for the 2024–2026 timeframe.

20 Based on the results of the Supplemental Planning Analysis, the
21 Companies now recommend that the Commission approve, as reasonable, the
22 near-term supply-side development and procurement activities identified for

1 2024–2026 in the updated NTAP as presented in the Supplemental Planning
2 Analysis. The Supplemental Planning Analysis affirms the need for all the
3 NTAP activities identified in the Companies’ initial filing and identifies the
4 need for additional and accelerated actions. As I noted above, my Supplemental
5 Direct Exhibit 1 updates the Companies’ requests for relief, and my
6 Supplemental Direct Exhibit 2 shows the updates to the NTAP as informed by
7 the Companies’ Supplemental Planning Analysis.

8 **Q. CAN YOU PROVIDE DETAILS ABOUT THE ECONOMIC**
9 **DEVELOPMENT GROWTH IN THE CAROLINAS THAT RESULTED**
10 **IN THE NEED FOR THE SUPPLEMENTAL PLANNING ANALYSIS?**

11 A. The Carolinas’ strong and vibrant economic environment, fostered by decades
12 of strong energy policy, is driving the need for even further accelerated and
13 decisive execution activities in the near-term to achieve the State’s energy
14 policy goals. The region continues to experience growth in demand for
15 electricity driven by ongoing economic successes, including significant new
16 and expanding load from manufacturing, electric transportation, data center,
17 and advanced cloud computing and blockchain operations customers that have
18 recently made new announcements and material commitments to take electric
19 service from the Companies. Moreover, many of these projects have load
20 factors higher than 90% driven by the nature of the businesses, resulting in the
21 need for around-the-clock generation supply.

22 As highlighted in Chapter NC to the initial Resource Plan, the

1 Companies helped secure over \$13 billion in capital investments and over
2 17,000 jobs to North Carolina and \$3.8 billion in capital investments and over
3 4,700 jobs to South Carolina projected through 2022. In 2023, the Companies
4 helped secure a projected additional \$10 billion in capital investments and over
5 6,000 jobs in North Carolina and \$4.8 billion in capital investments and over
6 2,700 jobs in South Carolina.

7 In my direct testimony, I stated that the Companies are forecasting
8 annual energy demand increases from previous forecast cycles of 8% by 2030
9 and 11% by 2035. That need has now increased to 22% by 2030 and 25% by
10 2035 from the 2022 planning cycles. Table SPA NC-1 in the Chapter NC update,
11 being filed contemporaneously with this testimony, provides additional details
12 regarding the changes to the Companies' load forecast from spring to fall as
13 well as the incremental resource additions needed to serve that load.

14 In addition, there is potential for the load forecast to increase even
15 further than projected in the Updated 2023 Fall Load Forecast. To account for
16 this potential growth, in addition to updating the base load forecast, the
17 Companies also prepared a higher Continued Economic Development Load
18 Forecast to assess system resource needs for potential large development
19 project sites that have not yet made material commitments sufficient to include
20 in the Updated 2023 Fall Load Forecast. The impact of this potentially higher
21 level of economic development projects on the high load forecast is provided
22 in Table SPA 2-10.

1 **Q. HOW HAVE THE COMPANIES RESPONDED TO THIS SIGNIFICANT**
2 **INCREASE IN LOAD FORECAST?**

3 A. North Carolina law tasks the Commission and the Companies with reviewing
4 and updating the Carbon Plan as the Companies continue to plan to execute the
5 least-cost path to achieving the state's carbon emission reduction goals. The
6 Companies' Supplemental Planning Analysis updates the Companies' proposed
7 detailed plans for execution in the near-term and resource needs over the longer-
8 term CIPRP planning horizon, while ensuring that planned generation and
9 resource changes maintain or improve upon the adequacy and reliability of the
10 existing grid.

11 As addressed in the Supplemental Planning Analysis and further
12 supported by the IRP and Near-Term Actions Panel's supplemental direct
13 testimony, Duke Energy supports continuing to plan under Energy Transition
14 Pathway 3 to achieve the Interim Target by 2035, including planning to retire
15 and replace 14 coal units totaling 8,400 MW of capacity by the end of 2035.
16 Accordingly, the Companies have developed their updated Execution Plan and
17 proposed near-term actions to support the resources needed by Portfolio P3 Fall
18 Base as the most reasonable, least-cost, and least-risk plan to execute the energy
19 transition and to ensure the continued economic growth and vitality in the
20 Carolinas. The Companies' initial NTAP represented an aggressive and
21 challenging pace, scope, and scale of resource additions. The updated NTAP
22 reflects additional and accelerated actions that are necessary in the near and

1 intermediate term in order to meet approximately 2 GW of increased winter
2 peak demand identified in the Updated 2023 Fall Load Forecast by the early
3 2030s. The incremental resource additions identified in the updated NTAP
4 include significantly more capacity additions of solar, battery storage,
5 hydrogen-capable combustion turbines and combined cycles and offshore wind
6 resources as compared to Core Portfolio P3 Base and will require decisive and
7 bold actions to advance the energy transition in a timely manner. Importantly,
8 if economic development continues on a trend similar to 2023, even more
9 incremental resources will be needed to meet growing customer demand.

10 **Q. DO THE COMPANIES' UPDATED EXECUTION PLANS ALSO**
11 **CONTINUE TO UTILIZE DEMAND-SIDE RESOURCES TO**
12 **MITIGATE INCREASING LOAD?**

13 A. Yes. The Companies will continue to identify and investigate opportunities to
14 “shrink the challenge” of increasing load and costs through aggressively
15 pursuing Grid Edge and other Customer Programs,¹ which include energy
16 efficiency and demand-side management measures, as well as certain rate
17 designs, voltage control efforts, renewable energy programs, behind-the-meter
18 generation and storage, and electric transportation programs.

19 **Q. PLEASE PROVIDE ANY CONCLUDING REMARKS.**

20 A. North Carolina’s constructive and forward-thinking energy policies have laid
21 the foundation for a vibrant and growing economy in the state and made the

¹ As described in the Carolinas Resource Plan, Appendix H (Grid Edge and Customer Programs).

1 state a national leader in economic development. Continuing the energy
2 transition furthered by HB 951 while maintaining or improving reliability will
3 ensure the state remains a national leader and will require prudent and
4 intentional planning, timely regulatory approvals and decisive but balanced
5 execution. The Companies remain confident that they are well-positioned to
6 execute on these challenges, all under the guidance of the Commission and the
7 constructive and deliberate energy policies of the state. The updated near-term
8 actions presented in Bowman Supplemental Direct Exhibit 2 and updated
9 requests for relief presented in Bowman Supplemental Direct Exhibit 1
10 represent meaningful progress on the energy transition and are the reasonable
11 steps the Commission should approve at this time to support continued
12 execution of the CPIRP under N.C.G.S. § 62-110.9 and HB 951.

13 **Q. DOES THIS CONCLUDE YOUR SUPPLEMENTAL DIRECT**
14 **TESTIMONY?**

15 A. Yes. It does.

Verified Amended Petition for Approval of 2023-2024 Carbon Plan and Integrated Resources Plan of Duke Energy Carolinas, LLC and Duke Energy Progress, LLC

Requests for Relief

(1) Affirm that the Companies' 2023-2024 CPIRP modeling, including the Supplemental Planning Analysis, is reasonable for planning purposes and presents a reasonable plan for achieving the State's authorized CO₂ emissions reductions targets in a manner consistent with the requirements of N.C.G.S. § 62-110.9 and prudent utility planning.

(2) Approve near-term supply-side development and procurement activities identified above for 2024-2026 (over and above the resources selected and approved in the 2022 *Carbon Plan Order*¹) and take the following specific actions:

(a) Deem the following resources as being selected in the 2023 CPIRP, in all cases subject to the obligation to obtain a CPCN (where applicable) and require the Companies to keep the Commission apprised of material changes in assumed pricing or schedule:

- (i) 235 MW of solar and solar plus storage² to be procured through an RFP conducted in 2024 (incremental to the 1,350 MW of solar and solar plus storage approved by the Carbon Plan Order for the same period to address experienced and forecasted attrition);
- (ii) 2,700 to 3,460 MW of new controllable solar generation to be procured in RFPs conducted in 2025 and 2026 (subject to

¹ See *Carbon Plan Order* at 79 (authorizing the Companies to plan for approximately 1,200 MW of new CC and 800 MW of new CT resources); at 133 (authorizing procurement 2,350 MW of new solar resources) at 133 (authorizing development and procurement of 1,000 MW of stand-alone storage and 600 MW of paired storage).

² The Companies' planned 2024 Solar and Solar paired with Storage RFP will target 400 MW of paired storage inclusive of both the remaining 340 MW of paired storage approved in the 2022 Carbon Plan Order along with an additional 60 MW of paired storage presented for Commission selection in this proceeding.

CTPC approval of RZEP 2.0 projects), a substantial portion of which is assumed to be paired with storage;

- (iii) 1,100 MW of battery storage (targeting 475 MW stand-alone storage and 625 MW storage paired with solar incremental to the 1,600 MW storage approved in Carbon Plan Order) for procurement and development in 2024 to 2026 to achieve commercial operation by 2031;
- (iv) 1,200 MW of onshore wind to achieve commercial operation by 2033;
- (v) 1,325 MW of additional CTs to achieve commercial operation by 2031;
- (vi) 5,600 MW of additional CCs to achieve commercial operation by 2033;
- (vii) 1,834 MW pumped storage hydro at the Bad Creek II facility to be placed into service by 2034.

(b) Approve the Companies' plans to continue development activities in 2024-2026 to support the future availability of SMRs to ensure that these breakthrough technologies are available options for the Companies' customers on the timelines identified in the Plan;

(c) Approve the Companies' plans to pursue activities in 2024-2026 to support the acquisition and future availability of offshore wind by issuing an ARFI in early 2025 for up to 2,400 MW of offshore wind off the coast of North Carolina to better determine the cost and availability of offshore wind resource options for the Companies' customers on the timelines identified in the Plan;

(d) Make the following additional determinations with respect to the initial development activities for onshore wind, pumped storage hydro, and advanced nuclear as described in Chapter NC:³

- (i) Engaging in initial project development activities for these resources is a reasonable and prudent step in executing the updated Carbon Plan and necessary to enable execution of onshore wind and Bad Creek II as well as potential selection of SMRs in the future to be available on the timeline for achieving the Interim Target identified in the Plan;
- (ii) The Companies are authorized to incur project development costs up to \$64.5 million for the development of three annual tranches of onshore wind through 2026 for purposes of achieving 1,200 MW in service by 2033;
- (iii) The Companies are authorized to incur project development costs up to \$165 million for the development of pumped storage hydro from 2023 through 2026;
- (iv) The Companies are authorized to incur initial development costs up to \$1.4 million to develop and administer an ARFI to assess the cost of procuring up to 2,400 MW of offshore wind located off the North Carolina coast;
- (v) Pursuant to N.C.G.S. § 62-110.7, the Companies are authorized to incur project development costs up to \$75 million through 2024 plus an additional \$365 million through 2026 for the development of advanced nuclear resources;
- (vi) The Commission's approval of the Companies' request to incur project development costs constitutes reasonable assurance of cost recoverability in a future general rate case subject to the Commission's review of the reasonableness and prudence of specific costs incurred in such future proceeding; and
- (vii) That in the event these long lead time resources are ultimately determined not to be necessary to achieve the energy transition and the CO₂ emission reduction targets, such project development costs will be recoverable through

³ See CPIRP Chapter NC, Table NC-2 (providing a reconciliation of 2022 Carbon Plan and 2023 CPIRP near-term development activities and requests for pre-approval).

base rates over a period of time to be determined by the Commission at the appropriate time;

(3) Approve proposed actions with respect to existing supply-side resources, including continued disciplined pursuit of SLRs and pursuing power uprate projects for the Companies' existing nuclear fleet as described in Appendix J as well as through the planned CC unit flexibility projects as described in Appendix K;

(4) Approve the Companies' updated schedule for planned coal retirements in the near- and intermediate term supported in Appendix F and the Supplemental Planning Analysis as reasonable for planning purposes;

(5) Approve and find reasonable the Companies' continued use of 1% of eligible load annual utility energy efficiency savings in the CPIRP modeling as a base assumption and that such target is reasonable and appropriate for future planning purposes;

(6) Acknowledge the need for the RZEP 2.0 projects identified in Table L-7 of Appendix L; and

(7) Grant such other and further relief as the Commission deems just and proper.

Bowman Exhibit 2: Supplemental Planning Analysis Section 4 (Execution Plan Updates) Table SPA 4-1

Table SPA 4-1: Updated Proposed Near-Term Actions and Development Activities Informed by Supplemental Analysis ¹

August NTAP Resource	August NTAP MW Amounts	Supplemental Incremental Resource MW Amounts	Total August NTAP + Supplemental Resource MW Amounts	Total August NTAP + Supplemental Proposed Near-Term Actions 2024–2026 and Development Activities
 Solar	6,000 by 2031	460 by 2031	6,460 by 2031	- Continue RZEP 1.0 projects and advance RZEP 2.0 projects.¹ - 2024: Procurement targeting 1,585 MW of solar and solar paired with battery energy storage (“SPS”) (approximate 2028 in-service date). - 2025–2026: Procurements targeting approximately 2,700 to 3,460 MW of solar and dependent on RZEP 2.0 (approximate 2029-2030 in-service date) and future RFP attrition of procured solar.
 Battery Storage ²	2,700 by 2031	175 MW of Standalone Storage now planned for Storage paired with Solar	2,700 by 2031	- 2024 to 2026: Develop and study additional 475 MW of stand-alone battery storage incremental to 2022 NC Plan. - 2024 to 2026: Target procurement of 965 MW of SPS (625 MW of SPS incremental to 2022 NC Plan).
 Onshore Wind	1,200 by 2033	-	1,200 by 2033	- Select development partner(s), perform site feasibility studies and begin activities associated with siting and development for onshore wind projects.³ - Submit interconnection requests into 2025-2026 DISIS interconnection clusters.
 CT ⁴	1,700 by 2032	425 by 2031	2,125 by 2031	- 2024: File Certificate of Public Convenience and Necessity (“CPCN”) for 2 Marshall Advanced CTs at 900 MW (BOY 2029 in-service), submit air permits, begin transmission build-out engineering/modifications. - 2024: Evaluate siting options and submit interconnection Study requests for 850 MW CT 3 & 4 (BOY 2030 in-service). - 2025: File CPCN and air permit for 850 MW (CT 3 and 4) (BOY 2030 in-service). - 2025: Evaluate siting options and submit interconnection request/GRR for 425 MW CT 5 (BOY 2031 in-service). - 2026: File CPCN and air permit for 425 MW (CT 5) (2031 BOY in-service).

¹ See Carolinas Resource Plan Chapter 4 (Execution Plan) Table 4-2: Supply-Side Near-Term Actions Plan 2023 to 2026 for additional detail on proposed near-term actions presented in the Initial Plan.

August NTAP Resource	August NTAP MW Amounts	Supplemental Incremental Resource MW Amounts	Total August NTAP + Supplemental Resource MW Amounts	Total August NTAP + Supplemental Proposed Near-Term Actions 2024–2026 and Development Activities
 CC ⁴	4,080 by 2031	2,720 by 2033	6,800 by 2033	- 2024: File CPCNs for Person County Advanced CC1 and CC2 (each at 1,360 MW) (BOY 2029 & 2030 in-service, respectively); submit air permit, begin transmission build-out engineering/modifications. - 2024: Submit Interconnection Requests for 2 CCs (Person County Advanced CC2 and SC-located CC3; 1,360 MW each; BOY 2030 and 2031 in-service, respectively). - 2025: File SC Certificate of Environmental Compatibility and Public Convenience and Necessity (“CECPCN”) for CC3 (2031 in-service), submit air permit. - 2025: Evaluate siting options and submit Interconnection Requests and/or GRR for 2 additional CCs (CC4 and CC5; 1,360 MW each; BOY 2032 and 2033 in-service, respectively). - 2025: File CPCN and submit air permit for CC4 (2032 in-service). - 2026: File CPCN and submit air permit for CC5 (2033 in-service). - 2026: Begin transmission build-out engineering/modifications for CC4 & CC5 (BOY 2032 and 2033 in-service, respectively).
 Pumped Storage Hydro ^{5,6}	1,700 by 2034	134 by 2034	1,834 by 2034	- 2025: Subject to necessary regulatory guidance and support, target SC CECPCN. - 2025 and 2026: File NC Out of State CPCN, file final FERC licensing application, prepare for construction.
 Advanced Nuclear ⁶	600 by 2035	-	600 by 2035	- Site 1 – 2024 to 2026: Choose reactor technology, submit early site permit (“ESP”), develop construction permit/license application, contract with reactor vendor, and order long-lead equipment. - Site 2 – 2025 to 2026: Develop and submit ESP.
 Offshore Wind ⁶	-	2,400 by 2035	2,400 by 2035	- Conduct Acquisition Request for Information (“ARFI”) with current Carolinas Wind Energy Area (off NC coast) lessees. - Conduct stakeholder engagement and outreach in connection with ARFI. - Report results of ARFI in next Carolinas Resource Plan filings. - Continue limited development of onshore transmission to support offshore wind.

Note 1: RZEP 2.0 subject to local transmission planning process. See Carolinas Resource Plan Appendix L (Transmission System Planning and Grid Transformation).

Note 2: Battery Storage amount includes stand-alone battery development and SPS amounts. Annual targets may be adjusted during development.

Note 3: To achieve in-service capacities for onshore wind, the Companies will target higher development quantities to account for assumed levels of project attrition.

Note 4: The exact amounts, models, configurations and timing of CTs and CCs will depend on specific system needs and optimizing for execution.

Note 5: Bad Creek II Pumped Storage Hydro is projected to come into service by mid-2033; for planning purposes, the modeling reflects this resource coming into all portfolios at BOY 2034. Capacity was rounded up from 1,680 MW to 1,700 MW in initial Plan NTAP.

Note 6: The Companies note that with any long lead-time resource that results in a large, multi-year construction project, the recovery of the Companies’ financing costs during the construction period is important to ensure strong credit ratings to facilitate the lowest possible financing costs for customers. In addition, recovery of financing costs during construction lowers the overall cost that customers pay over the life of the investment. When financing costs are recovered during the construction period, non-financing project costs are still included in customer rates only after the related project is in operation and providing service to customers, unless otherwise determined by the Commissions.