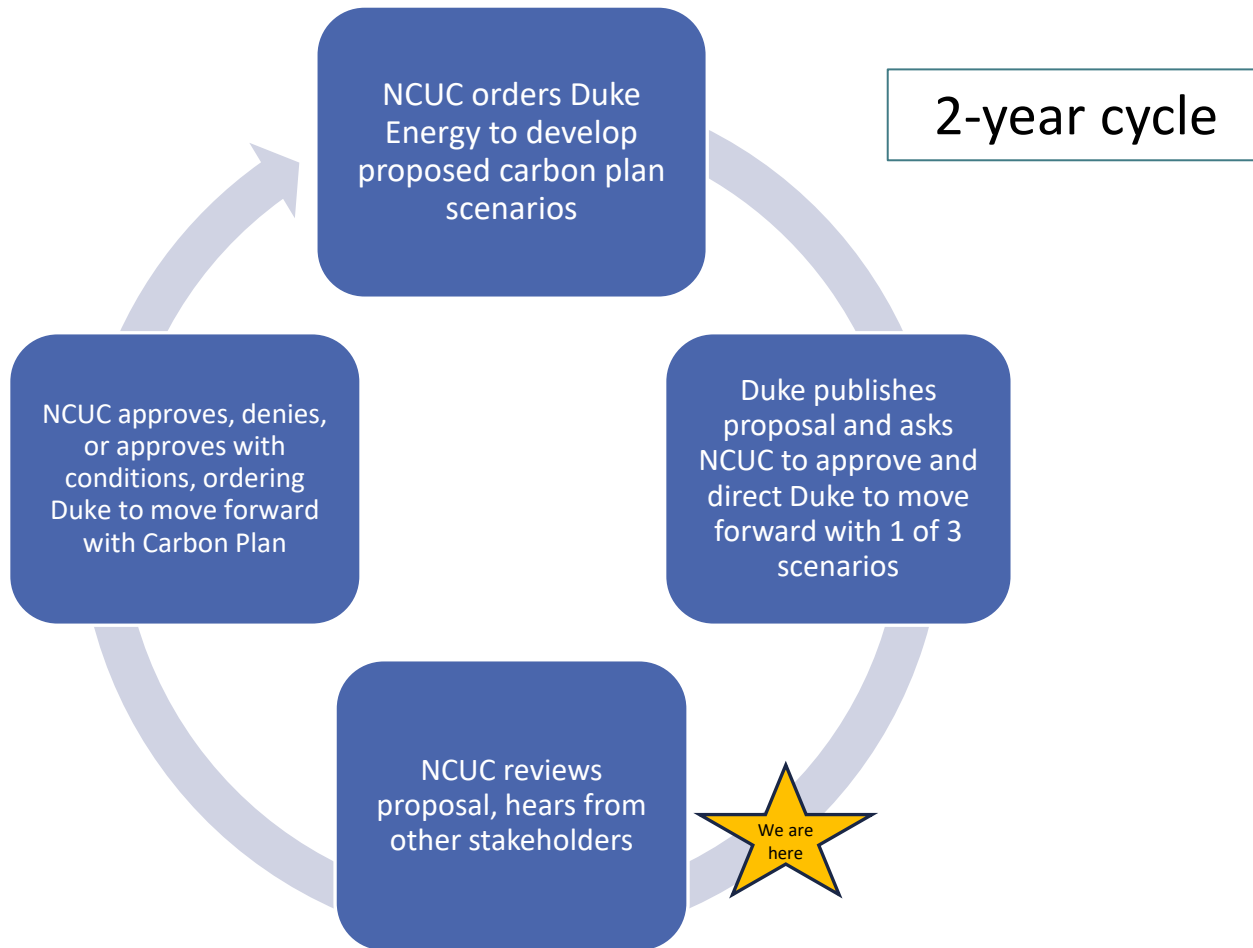



2024 Carbon Plan Update

Bailey Recktenwald
NCTOWERS Meeting
November 2, 2023



Carbon Plan Development Process



2022 Carbon Plan Order (First Carbon Plan)

“The Commission supports offshore wind and agrees that Duke’s ‘no regrets’ and ‘all of the above’ approaches are appropriate. However, the near-term development steps Duke outlines with respect to offshore wind first require identification of the appropriate WEA.

Therefore, the Commission determines that Duke should commence evaluating the three alternative WEAs. **The Commission directs Duke to study and consider each of the three WEAs off the coast of North Carolina before pursuing acquisition of a leasehold.** This evaluation should include best estimates of all relevant costs to acquire and develop a WEA and deliver energy to the point of injection into Duke’s grid.” (p. 102)

Must **report findings** and evaluation either in first CIPRP or sooner.

2022 Carbon Plan Order

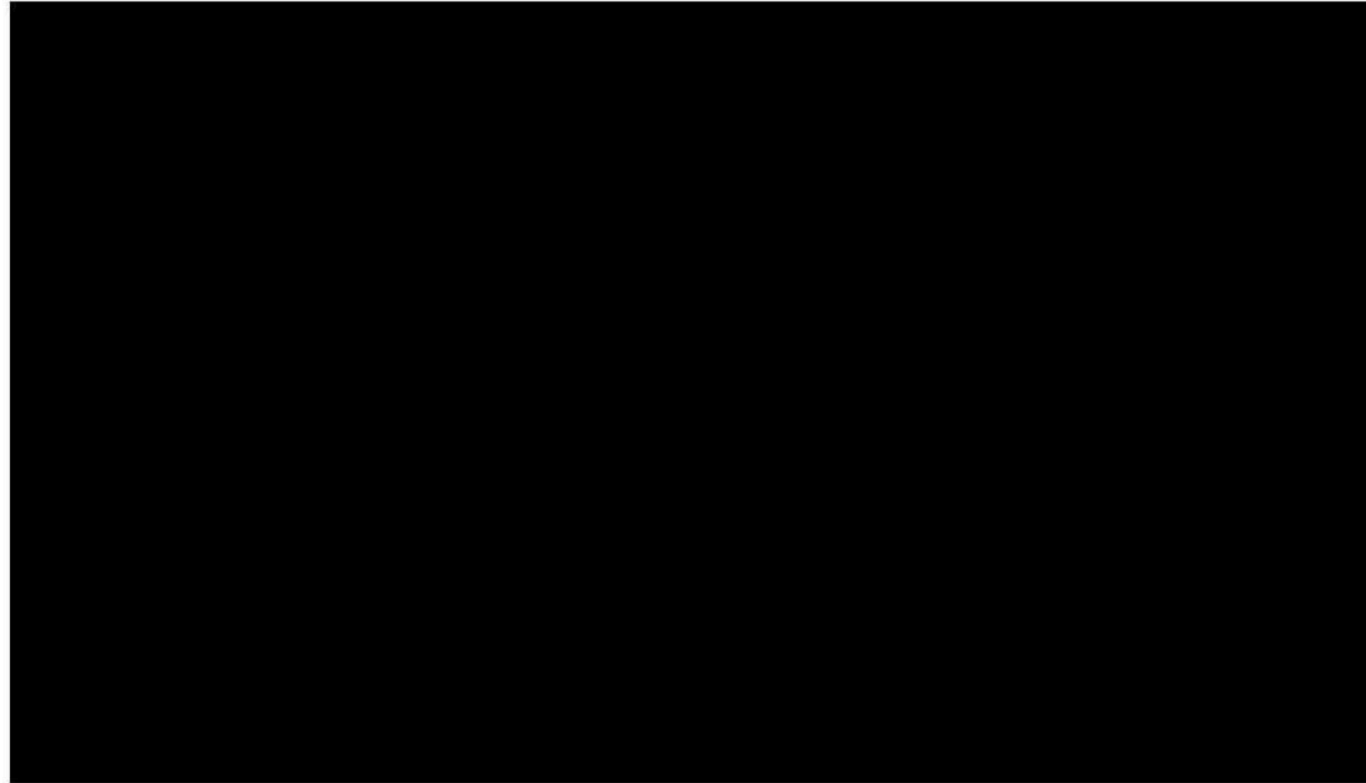
“26. That Duke **shall study and consider each of the three currently available WEAs** off the coast of North Carolina, adopting steps in its evaluation process to protect against any potential affiliate bias, and report the findings of its evaluation of the WEAs to the Commission in its first CPIRP filing;

27. That Duke shall investigate and **pursue any federal funding** that is available, through the **IJA or the IRA** or any subsequent legislation, for offshore wind facilities and associated infrastructure;” (p. 133)



Table 3: LCOE of Offshore Wind Projects (including onshore transmission network upgrades). Costs assume 2031 in-service year

[BEGIN HIGHLY CONFIDENTIAL ATTORNEYS' EYES-ONLY INFORMATION]



[END HIGHLY CONFIDENTIAL ATTORNEYS' EYES-ONLY INFORMATION]

OFFICIAL COPY

Sep 01 2023

Duke's 2023 Proposed Carbon Plan



Published August 17, 2023













3 portfolio pathway options













Duke asking for Portfolio 3





**By January 1
2030**

	 Grid Edge	 Coal Retirements	 Solar	 Battery	 CT	 CC	 Onshore Wind	 Pumped Storage Hydro	 Advanced Nuclear	 Offshore Wind
P1 Base	EE at least 1% of eligible retail sales	(-7.1 GW)	6.6 GW	5.1 GW	1.7 GW	2.7 GW	0.3 GW			1.6 GW
P2 Base	IWC growing to 96% (DEC) & 97% (DEP) circuits	(-2.2 GW)	4.1 GW	0.9 GW	2.1 GW	1.4 GW				
P3 Base	Winter DR & CPP			0.7 GW						











**By January 1
2033**

	 Grid Edge	 Coal Retirements	 Solar	 Battery	 CT	 CC	 Onshore Wind	 Pumped Storage Hydro	 Advanced Nuclear	 Offshore Wind
P1 Base	EE at least 1% of eligible retail sales	(-7.1 GW)	13.4 GW	6.1 GW	2.6 GW	2.7 GW	1.5 GW			2.4 GW
P2 Base	IWC growing to 96% (DEC) & 97% (DEP) circuits	(-6.2 GW)	8.8 GW		2.1 GW	4.1 GW	1.2 GW			1.6 GW
P3 Base	Winter DR & CPP	(-4.8 GW)		3.4 GW						

**By January 1
2035**

	 Grid Edge	 Coal Retirements	 Solar	 Battery	 CT	 CC	 Onshore Wind	 Pumped Storage Hydro	 Advanced Nuclear	 Offshore Wind
P1 Base	EE at least 1% of eligible retail sales	(-8.4 GW)	14.9 GW	6.1 GW	2.6 GW	2.7 GW	2.3 GW			2.4 GW
P2 Base	IWC growing to 96% (DEC) & 97% (DEP) circuits	(-6.2 GW)	11.8 GW	6.7 GW	2.1 GW	4.1 GW	1.7 GW	1.7 GW	0.6 GW	1.6 GW
P3 Base	Winter DR & CPP		11.9 GW	4.3 GW			2.1 GW			0-1.6 GW

**By January 1
2038**

	 Grid Edge	 Coal Retirements	 Solar	 Battery	 CT	 CC	 Onshore Wind	 Pumped Storage Hydro	 Advanced Nuclear	 Offshore Wind
P1 Base	EE at least 1% of eligible retail sales		15.8 GW	6.1 GW	2.6 GW	2.7 GW	2.3 GW		3.0 GW	2.4 GW
P2 Base	IWC growing to 96% (DEC) & 97% (DEP) circuits	(-8.4 GW)	14.1 GW	7.0 GW	2.1 GW		2.1 GW	1.7 GW	2.4 GW	1.6 GW
P3 Base	Winter DR & CPP		14.6 GW	6.0 GW	3.0 GW	4.1 GW	2.3 GW			0-1.6 GW



Duke's Proposed 2023 Carbon Plan





21. Importantly, all three Energy Transition Pathways employ similar base assumptions, but require a different pace, scope and scale of resource additions to achieve the Interim Target. As described in Chapter 3 (Portfolios) and Chapter NC, at this snapshot in time, the Companies recommend Pathway 3 as the most reasonable, least cost, and least risk pathway to inform the near-term reasonable steps required to progress the reliable and orderly transition of the Carolinas system.²⁵ While still requiring an aggressive level of resource additions, Pathway 3 selects a balanced pace of new resource additions, including the addition of breakthrough advanced nuclear in the mid-2030s,²⁶ with lower execution risk.





Duke's Proposed Carbon Plan

28. Specifically, the Companies are proposing and requesting Commission approval of the supply-side development and procurement activities through 2026 as set forth in Table NC-1: Reconciliation of 2022 Carbon Plan and 2023 CPIRP Proposal – New Supply-Side Selections, which is reproduced here:

Table NC-1: Reconciliation of 2022 Carbon Plan and 2023 CPIRP Proposal – New Supply-Side Selections³²

Resource MW amounts	2022 Selection	2023 CPIRP	Additional to 2022 CP	2023 NTAP Progress	CPIRP Proposed Near-Term Actions 2024–2026
 Solar	3,100	6,000 by 2031	2,700 to 3,150	<ul style="list-style-type: none"> - 2022 SP: 964.7¹ - 2023 SP/SPS: 1,435¹ - Continue RZEP 1.0 projects 	<ul style="list-style-type: none"> - Continue RZEP 1.0 projects and advance RZEP 2.0 projects.² - 2024 Procurement: 1435 - 2025–2026 Procurement: target 2,700 to 3,150
 Battery Storage ³	1,600	2,700 by 2031	1,100	<ul style="list-style-type: none"> - Stand-alone: progressing development on 1000⁴ - 2023 Solar RFP targeting 260 SPS 	<ul style="list-style-type: none"> - 2024 to 2026: Develop 650 stand-alone, target procurement of 790 of SPS (450 SPS incremental to 2022 Carbon Plan)
 Onshore Wind	0	1,200 by 2033	1,200	<ul style="list-style-type: none"> - Carolinas site screening evaluation 	<ul style="list-style-type: none"> - Site feasibility and development for Definitive Interconnection System Impact Study (“DISIS”) and 2031–2033 in-service, respectively⁵ - 300 for 2025 DISIS - 450 for 2026 DISIS - 450 for 2027 DISIS
 CT ⁶	800	1,700 by 2031	900	<ul style="list-style-type: none"> - Generator Replacement Request (“GRR”) - Pre-Certificate of Public Convenience and Need (“CPCN”) for 2 CT’s (2029) 	<ul style="list-style-type: none"> - 2024: CPCN for 2 CT’s (2029) - 2025: CPCN for 1 CT (2030) - 2026: CPCN for 1 CT (2032)

Resource MW amounts	2022 Selection	2023 CPIRP	Additional to 2022 CP	2023 NTAP Progress	CPIRP Proposed Near-Term Actions 2024–2026
 CC ⁶	1,200	4,080 by 2032	2,880	<ul style="list-style-type: none"> - GRR - Pre-CPCN for 1 CC in-service beginning of year 2029 	<ul style="list-style-type: none"> - 2024: CPCN for 1 CC (2029) - 2025: CPCN for 2 CC's (2030, 2031)
 Pumped Storage Hydro	0	1,700 by 2034 ⁷	1,700	<ul style="list-style-type: none"> - Entered 2022 queue - Issued major equipment RFP - Initial construction estimates - Continued Federal Energy Regulatory Commission (“FERC”) license activities 	<ul style="list-style-type: none"> - 2024: SC Certificate of Environmental Compatibility and Public Convenience and Necessity (“CECPCN”) - 2025 and 2026: File NC Out of State CPCN, file final FERC application

Note 1 : 2022 and 2023 Solar Procurements includes residual quantities from previous procurements.

Note 2 : RZEP 2.0 subject to local transmission planning process. See Appendix L (Transmission System Planning and Grid Transformation).

Note 3 : Battery Storage amount includes stand-alone battery development and SPS amounts. Annual targets may be adjusted during development.

Note 4 : Includes stand-alone storage resources currently in advanced development.

Note 5 : The exact amounts, models, configurations, and timing of CT's and CC's will depend on specific system needs and optimizing for execution.

Note 6 : To achieve in-service capacities for onshore wind, the Companies will target higher development quantities to account for assumed levels of project attrition.

Note 7 : 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 resource portfolios at BOY 2034.

P3 Variants Calling for Offshore Wind

Table NC-3: Offshore Wind in Pathway 3 Portfolios

Pathway 3 Portfolios	Offshore Wind
Delayed Nuclear	1,600 MW by 2035
Low Onshore Wind	800 MW by 2034
Low Solar	800 MW by 2034
Limited Gas Supply	800 MW by 2034
High Resource Costs	800 MW by 2033
MVP	800 MW by 2034
Low Gas Prices	800 MW by 2033
High Load	1,600 MW by 2034
Low EE	800 MW by 2034

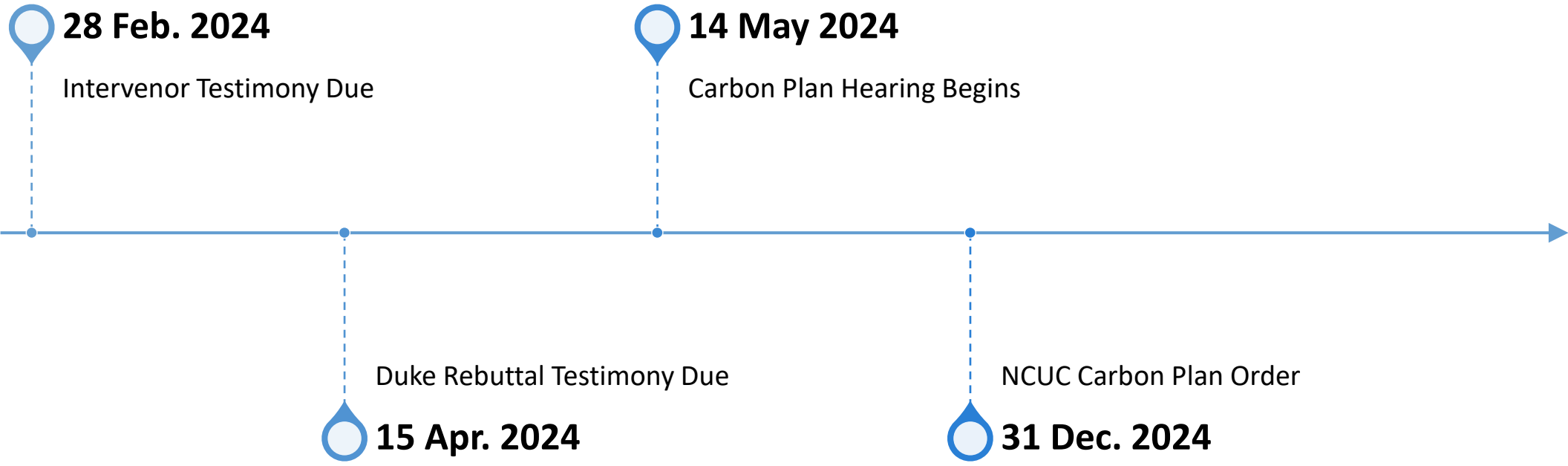


Duke's Proposed Carbon Plan

32. Offshore wind is not identified as needed under recommended Core Portfolio P3 Base through the end of the Base Planning Period in 2038. However, offshore wind is identified as needed for long-term carbon neutrality beyond 2038 and is identified in several Pathway 3 Portfolio Variants and Sensitivity Analysis Portfolios as needed by 2035. Thus, as planning and execution evolves in the near-term, offshore wind could become a future resource option for Pathway 3 in the Base Planning Period.³⁶ At this time, the 2023 NTAP and Execution Plan presents limited near-term planning and development activities that recognize the important potential role of this resource in the future and describes the Companies' plans to continue monitoring market developments and exploring the possibility of developing or procuring offshore wind resources in the Carolinas and maintaining its future optionality.³⁷



Next Steps



Questions?



Bailey Recktenwald -
bailey.recktenwald@nc.gov



Peter Ledford -
peter.Ledford@nc.gov