STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. E-100, SUB 190

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of 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.l(c)	))))))))	**DIRECT TESTIMONY OF JOSH KAPLOWITZ ON BEHALF OF ENVIRONMENTAL DEFENSE FUND**

I. Introduction

Q: MR. KAPLOWITZ, PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND POSITION AT LOCKE LORD LLP.

A: My name is Josh Kaplowitz and my business address at Locke Lord is 701 8th St. NW, Suite 500, Washington, DC 20001. My position is Senior Counsel.

Q: MR. KAPLOWITZ, PLEASE BRIEFLY STATE YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND, INCLUDING YOUR RESPONSIBILITIES AS THEY RELATE TO THE SUBJECT MATTER OF YOUR TESTIMONY

A: I received a bachelor's degree from Yale University in political science in 2000 and a law degree from the University of Virginia in 2007. I began working in the U.S. offshore wind industry in 2012 as an associate at the law firm Crowell & Moring in Washington, D.C., when I helped evaluate Department of Energy grant applications for offshore wind pilot projects. I subsequently provided pro bono legal counsel to the American Wind Energy Association creating an offshore wind siting handbook from 2012 to 2014.

From 2015 to 2020, I served in the U.S. Department of the Interior's Office of the Solicitor as the primary attorney advisor to the Bureau of Ocean Energy Management's ("BOEM") Offshore Renewable Energy Programs. In this capacity, I advised BOEM on (among other things) its offshore wind lease sales (including the Kitty Hawk sale); permitting reviews and approvals; revisions to its regulations; and interactions with developers, stakeholder groups, and state regulatory agencies. A key aspect of this job involved staying informed on the commercial aspects of

the U.S. offshore wind industry through regular communication with offshore wind developers and state regulators. This enabled me to understand the nexus between federal and state regulatory processes and the economic and technical needs of a nascent U.S. offshore wind industry, and optimize my legal advice accordingly.

After leaving the federal government, I spent 15 months at GE Renewable Energy as senior commercial counsel for their U.S. offshore wind business, where I negotiated turbine sales agreements and service and maintenance agreements with offshore wind developers. In this role, it was critical that I understand the commercial needs of my client and its current and prospective customers.

From late 2021 to late 2023, I served as the Vice President for Offshore Wind at the American Clean Power Association ("ACP"). As lead advocate for the U.S. offshore wind industry, I met on a daily basis with representatives from offshore wind developers and original equipment manufacturers ("OEMs") to discuss their commercial, technical, and legal challenges and develop potential policy prescriptions that could help mitigate or resolve such challenges. I also worked closely with experts at the U.S. Department of Energy and particularly their National Renewable Energy Laboratories ("NREL"), other federal agencies, and outside consultancies to learn from their independent experience, including by conducting peer reviews of numerous publications. Ultimately, my job was to collect all of this information, use it to develop consensus policy positions in consultation with industry members, and advocate for these policies with federal and state governmental officials.

I left ACP at the end of October 2023, and I currently serve as senior counsel at Locke Lord LLP, where I advise offshore wind developers and advocacy groups on legal and policy issues. I do not represent any offshore wind developers related to the three North Carolina Offshore Wind Energy Areas.

Finally, and on a more personal note, I was born in North Carolina, and have always felt a close affinity for the state. While in the federal government and at ACP, I spent a great deal of my time studying the prospects for offshore wind in North Carolina and the pathways to harness its considerable wind energy resource. It is an honor to now testify as an expert witness in a proceeding where the future of the industry in the state is on the line.

Q: MR. KAPLOWITZ, ON WHOSE BEHALF ARE YOU TESTIFYING?

A: I am testifying on behalf of Environmental Defense Fund, an intervenor in this proceeding.

Q: MR. KAPLOWITZ, HAVE YOU PREVIOUSLY TESTIFIED IN FRONT OF THE NORTH CAROLINA UTILITIES COMMISSION?

A: No.

II. Summary

Q: MR. KAPLOWITZ, PLEASE SUMMARIZE YOUR TESTIMONY.

A: I would summarize my testimony as follows:

- Offshore wind is a mature and still improving technology with a rapidly growing U.S. footprint that capable of not just helping NC reach its interim requirement of 70% carbon emissions reductions, but also ensuring a path to carbon neutrality in 2050. Offshore wind can achieve this by creating synergies

with other carbon-free energy—particularly solar energy in the winter months—and exploiting economies of scale, but only if developers have financial certainty and a project pipeline.

- US experience shows that if states establish policy certainty, offshore wind can be delivered on time and on budget. Duke Energy Progress, LLC ("DEP") and Duke Energy Carolinas, LLC ("DEC") (DEP and DEC collectively, or "Duke") have it backwards by asking NCUC to be reactive to what is a dynamic industry environment.
- Duke's Supplemental Preferred Portfolio is a vast improvement over its prior preferred portfolio, but it is unlikely to catalyze offshore wind development in North Carolina because it proposes no path to market, is too cautious regarding the timing of first delivery, and suggests a 2.4 GW "one-shot" approach with no vision of a project pipeline and long-term presence.
- This Commission can secure the best deal for ratepayers by expeditiously ordering Duke to provide financial certainty for developers and a quicker timeline for first OSW delivery, while in the meantime allowing Duke to recover certain permitting costs to ensure specific projects can progress while they are waiting for such financial certainty.
- North Carolina would benefit from a bigger total offshore wind development target that includes expedited development of all existing North Carolina offshore wind leases and a vision for a long-term pipeline that sparks further leasing off the state's coastline.

Q: MR. KAPLOWITZ, WHAT ARE YOUR RECOMMENDATIONS TO THE COMMISSION?

A: Based on the analysis below, I recommend the Commission issue an order requiring the following with respect to offshore wind energy:

- Require Duke to establish a competitive procurement mechanism, tied to an expedited Acquisition Request for Information ("ARFI") process, with targets of procuring offshore wind generation with the capacity for 2.4 GW delivered by 2032 and between 4.4 and 6.3 GW delivered by 2035, depending on whether the Kitty Hawk North project exports power to North Carolina or Virginia. This will put North Carolina developers on a concrete path to contractual certainty that will catalyze procurement efforts and local supply chain development and allow the kind of advanced planning (including necessary transmission upgrades) that will result in the best deal for ratepayers.
- Allow Duke to recover costs for any contracts it enters into for reasonable permitting expenses for the three North Carolina offshore wind developers. This will provide a "bridge" so that development may proceed throughout the design and execution of the competitive procurement process.
- Order Duke to study the role of offshore wind, beyond the initial 2.4 GW procurement, in achieving HB951's mandate for carbon neutrality by 2050, with sufficient funds to conduct this study. This will preserve maximum optionality for Duke to work toward net zero carbon and will send a signal to the federal government that more leasing off North Carolina would be appropriate.

III. Overview of the Offshore Wind Industry

Q: MR. KAPLOWITZ, PLEASE PROVIDE YOUR OVERALL ASSESSMENT OF THE NATIONAL OFFSHORE WIND INDUSTRY AND ITS OVERALL VALUE PROPOSITION.

A: Offshore wind is a commercially available and mature—but also rapidly improving—technology. Europe and Asia have had full-fledged offshore wind industries for decades, and it is poised for significant growth in the U.S. Duke Energy can benefit from being the proverbial "second mover" on offshore wind in the U.S., drafting off the lessons learned by state and federal regulators and developers during the first wave of projects and the domestic supply chain growth that is anticipated over the next 5-7 years.

By the end of 2023, over 75 GW of offshore wind projects were installed and generating clean power to grids on three continents.[1] Offshore wind installations are expected to accelerate worldwide in the next five years,[2] and nowhere is that more true than in here in the U.S. As of May 2024, there are approximately 4.1 GW of offshore wind generation under construction in the U.S.[3] 2023 saw full or partial construction of our first two utility scale projects, with the 132 MW South

[1] Global Wind Report 2024, GLOBAL WIND ENERGY COUNCIL (April 2024) at 141-42, https://gwec.net/global-wind-report-2024/ (hereinafter "GWEC 2024 Report").

[2] *Id.* at 153.

[3] Preliminary 2024 data from the National Renewable Energy Laboratory, "Draft Report V2, *Offshore Wind Market Report: 2024 Edition*," NATIONAL RENEWABLE ENERGY LABORATORY at vi, 7 [hereinafter Preliminary NREL Report].

Fork Wind Farm going online in March 2024[4] and the 800 MW Vineyard Wind 1 project generating power into the grid and slated for completion later this year.[5] There is a strong and growing queue of other offshore wind projects, as the U.S. pipeline continues to grow.[6] Preliminary 2024 data from the U.S. Department of Energy ("DOE") National Renewable Energy Laboratory ("NREL") estimates that as of May 2024, the U.S. offshore wind project pipeline has a potential generating capacity of 82,751 MW.[7] This represents a 48 percent growth from NREL's estimates last year,[8] when NREL estimated the pipeline had a 52,687 MW generating capacity.[9]

The primary driver of this growth is state offshore wind procurement mandates, which, as Table 1 demonstrates, are strongly correlated with project development:

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4 Diana DiGangi, *South Fork Wind becomes first US utility-scale offshore wind farm to complete construction*, UTILITY DIVE (March 18, 2024), https://www.utilitydive.com/news/south-fork-wind-begins-operations-New-York-Eversource/710536/.

5 *Avangrid, CIP Announce First Power from Nation-Leading Vineyard Wind 1 Project,* VINEYARD WIND (Jan. 3, 2024), https://www.vineyardwind.com/press-releases/2024/1/3/cip-avangrid-announce-first-power-from-nation-leading-vineyard-wind-1-project.

6 Preliminary NREL Report, at vi, xiv.

7 *Id.* at 7.

8 Walter Musial et al., *Offshore Wind Market Report: 2023 Edition*, NATIONAL RENEWABLE ENERGY LABORATORY (NREL), DOE/GO-102023-6059 (August 2023) at xi, https://www.energy.gov/sites/default/files/2023-09/doe-offshore-wind-market-report-2023-edition.pdf [hereinafter *NREL 2023 Market Report*].

9 *Id.* at 11.

State Planning Goals, Mandated State Procurements, and Offtake Contracts Awarded by Year

State	Planning Targets		Mandated Procurement		Offtake Contracts Awarded (MW)	Awarded Projects (MW)	Open/Pending Procurement (MW)	Supporting Policies and Documents
	Capacity (MW)	Year	Capacity (MW)	Year				
Maine	156	2030	-	-	12	Aqua Ventus (12)		*Maine Wind Energy Development Assessment* (2012)
Massachusetts	23,000	2050	5,600	2035	3,236	Vineyard Wind 1 (800) SouthCoast Wind 1 (804) SouthCoast Wind 2 (400) New England Wind (1,232)	400–3,600 (closes 1/31/2024)	*Act to Promote Energy Diversity* (2016) *Act to Advance Clean Energy* (2018) *Massachusetts 2050 Decarbonization Roadmap* (2020) *Act Creating a Next Generation Roadmap for Massachusetts Climate Policy* (2021)
Rhode Island	1,430	2030	1,430	2030	430	Block Island Wind Farm (30) Revolution Wind (400)	600–1,000 (closed 3/13/23)	*Request for Proposals for Long-Term Contracts for Offshore Wind Energy* (2022)
Connecticut	2,000	2030	2,000	2030	1,104	Revolution Wind (304) New England Wind (800)	Draft request for proposal for 1,196	*Public Act No. 19-71* (2019)
New York	20,000	2050	9,000	2035	4,362	South Fork Wind (132) Empire Wind 1 (816) Sunrise Wind 1 (924) Empire Wind 2 (1,260) Beacon Wind 1 (1,230)	1,000–2,000 (closed 1/26/2023)	*Case 18-E-0071* (2018) *Climate Leadership & Community Protection Act* (2019) *New York State Climate Action Council Scoping Plan* (2022)
New Jersey	11,000	2040	11,000	2040	3,758	Ocean Wind 1 (1,100) Ocean Wind 2 (1,148) Atlantic Shores Offshore Wind South (Project 1) (1,510)	1,200–4,000 (closes 6/23/23)	*Offshore Wind Economic Development Act* (2010) *Executive Order 8* (2018) *Executive Order 92* (2019) *Executive Order 307* (2022)
Maryland	8,500	2031	8,500	2031	2,045	Skipjack 1 (120) MarWin (270) Momentum Wind (809) Skipjack 2 (846)		*Maryland Offshore Wind Energy Act* (2013) *Clean Energy Jobs Act* (2019) *Promoting Offshore Wind Energy Resource Act* (2023)
Virginia	5,200	2034	5,200	2034	2,599	CVOW (Pilot) (12) CVOW (Commercial) (2,587)		*Virginia Clean Economy Act* (2021)
North Carolina	8,000	2040	-	-	-			*Executive Order 218* (2021)
California	25,000	2045	-	-	-			*AB 525* (2021) *Offshore Wind Energy Development off the California Coast: Maximum Feasible Capacity and Megawatt Planning Goals for 2030 and 2045* (2022)
Ohio	-	-	-	-	21	LEEDCo (21)		*None*
Louisiana	5,000	2035	-	-	-			*Louisiana Action Plan* (2022)
Oregon	3,000	2030	-	-	-			*HB 3375* (2021)
Total	**112,286**	**2050**	**42,730**	**2040**	**17,567**			

Table 1: State Planning Goals, Mandated Procurements, and Awarded Contracts (Source: NREL)[10]

If this trend continues, the growth in the U.S. market could parallel the "massive continued global market growth."[11] Recent and continued state regulatory activity has made offshore wind development more economically viable,[12] but we will only be able to realize the full energy generation and savings potential of offshore wind if states like North Carolina require procurement of offshore wind energy and commit to aggressive deployment mandates, and proactive grid planning and upgrades.[13]

Offshore wind provides significant value to states and ratepayers, as well as for our power generation grid. Offshore wind has high capacity factors and energy value,

[10] *NREL 2023 Market Report*, at 40.
[11] *Id.* at 88.
[12] *Id.* at 13.
[13] *Id.* at xi, 26.

characterized by experts as equivalent to the average price received for energy sold to the market.[14] Because offshore wind can produce energy across all hours, its energy value remains relatively stable.[15] It also works particularly well in conjunction with other carbon free technologies; offshore wind's energy value not only matches the rates of efficient gas and coal-fired plants but is almost twice that of solar photovoltaics.[16] As discussed further below, offshore wind can also help stabilize grid fluctuations, as its hourly fluctuations are lower than solar, particularly when solar penetration is high during the day.[17]

Europe was an early investor in offshore wind generation, and thanks to that commitment, costs have continued to decline due to larger, more efficient turbines and efficiencies within the value chain.[18] Due to the maturity of the industry, Europe is beginning to move to zero-subsidy bids where offshore wind developers sell electricity at the wholesale price.[19] The U.S. is poised to take advantage of Europe's experience, and as a result the projected cost of capital and operations and maintenance of new offshore wind operations is declining.[20] Costs relative to other

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[14] *See Offshore Wind Outlook 2019: World Energy Outlook Special Report,* INTERNATIONAL ENERGY AGENCY (2019), at 44, https://iea.blob.core.windows.net/assets/495ab264-4ddf-4b68-b9c0-514295ff40a7/Offshore_Wind_Outlook_2019.pdf [hereinafter *Wind Outlook*] (discussing the system value of offshore wind); North Carolina Offshore Wind Cost-Benefit Analysis, SOUTHEASTERN WIND COALITION, 16 (January 2022), https://sewind.org/wp-content/uploads/2023/01/NC_Offshore_Wind_Cost-Benefit_Analysis_FINAL.pdf [hereinafter Cost-Benefit].

[15] Wind Outlook, at 44.

[16] *Cost-Benefit,* at 16.

[17] *Id.* at 16-17.

[18] *Id.* at 6. European LCOE costs are projected to continue to drop primarily because Europe got an earlier start than the U.S. and is therefore a more mature market with a head start in realizing economies of scale and other cost stabilizers. *Id.* at 16.

[19] *See Offshore Wind in Europe*, Wind Europe (Feb. 2021) at 34, https://windeurope.org/intelligence-platform/product/offshore-wind-in-europe-key-trends-and-statistics-2020/.

[20] *Id.* at 6, 15.

energy sources are expected to fall further as the U.S. develops a domestic supply chain for offshore wind components.[21]

NREL recently conducted a low-carbon generation capacity model that includes construction of 85 GW offshore capacity in the Atlantic region by 2050, along with other generation resources like solar.[22] This study concluded that offshore wind "is projected to be a key part of achieving a low-carbon future for Atlantic states.[23] While offshore wind energy is a smaller fraction of the total energy in the U.S. under the model, it represents a "significant fraction of generation in the Atlantic regions," which only further underscores the importance of North Carolina joining its Atlantic state counterparts by committing to strong offshore wind development targets.[24] The study also confirms that offshore transmission development is critical to ensuring sufficient electricity supply; specifically, it adds value by offsetting other generation resources when loads are high by helping to serve the demand.[25] Furthermore, investing in offshore transmission planning and infrastructure can provide notable production cost value and facilitate greater use of carbon-free generation resources like offshore wind.[26]

Q: WHAT ABOUT RECENT ECONOMIC HEADWINDS BEING FACED BY THE OFFSHORE WIND INDUSTRY?

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21 *Id*. at 15.

22 *Atlantic Offshore Wind Transmission Study*, NATIONAL RENEWABLE ENERGY LABORATORY (NREL), (March 2024), at vii https://www.nrel.gov/docs/fy24osti/88003.pdf [hereinafter *Offshore Wind Transmission Study]*.

23 *Id.* at 129.

24 *Id*. at 14.

25 *Id.* at 65-66.

26 *Id.* at 88

A: U.S. offshore wind costs have increased in the last year as a result of macroeconomic trends such as inflation and rising interest rates that have affected every capital-intensive industry and every energy and infrastructure project.[27] Accordingly, all new energy generation development and construction will likely be affected by these same macroeconomic trends, not just offshore wind.[28] Despite broad economic headwinds, the future looks promising for offshore wind development.[29] Even under NREL's most conservative scenario, the long-term trend points toward lower costs due to improving technologies (as discussed further below) and a rapidly developing domestic supply chain.[30]

Q: MR. KAPLOWITZ, PLEASE DESCRIBE THE CURRENT STATE OF THE OFFSHORE WIND INDUSTRY IN NORTH CAROLINA, INCLUDING POTENTIAL OPPORTUNITIES AND CHALLENGES.

A: The offshore wind industry in North Carolina is several steps behind where it is in many states to the north. Unlike utility scale solar, which had federally mandated must-take contracts for facilities under 80 MW and later a proliferation of solar procurement programs, North Carolina does not yet have a regulatory framework allowing offshore wind developers to sell their power economically into the grid. However, several factors create significant future potential for the state to become an offshore wind hub: the decarbonization mandate contained in HB951, growing

[27] *NREL 2023 Market Report,* at xii, 81-83.

[28] *Id.* at xii (noting that macroeconomic and geopolitical events have also increased market uncertainty and costs such that the "complex external drivers are having both positive and negative impacts on offshore wind and broader energy industries.").

[29] The largest contributor to the life cycle costs of offshore wind plants are capital expenditures (CapEx), and NREL has found that "the capacity-weighted average CapEx for offshore wind projects has decreased since 2015." *Id.*, at 83.

[30] Annual Technical Baseline, *Offshore Wind,* NATIONAL RENEWABLE ENERGY LABORATORY (NREL),https://atb.nrel.gov/electricity/2023/offshore_wind (last visited May 21, 2024).

demand for electricity, four existing BOEM leases held by sophisticated and experienced developers of energy generation (with the sea space for more leases in years to come), grid reliability benefits in tandem with solar, a well-understood path to bring offshore wind power onto the North Carolina grid, potential for ports and manufacturing, and an educated workforce.

From an energy generation perspective, North Carolina's grid has access to four federal offshore wind leases totaling 232,496 acres with an energy generation potential of up to 6.3 GW according to calculations conducted by NREL.[31] BOEM, the State of North Carolina, and a wide array of stakeholders have invested years of time and energy into rigorously deconflicting the waters off the Outer Banks and Carolina Long Bay in order to arrive at these four lease areas. The leasing process commenced in early 2011 with the first meeting of North Carolina's Intergovernmental Task Force,[32] advancing to an auction of the Kitty Hawk lease area in early 2017 won by Avangrid—and subsequently divided into two leases, Kitty Hawk North and Kitty Hawk South.[33] Further leasing was put on pause during the prior presidential administration, culminating in a late 2020 order placing a moratorium on leasing for any offshore energy development south of

[31] Daniel Mulas Hernando and Walt Musial, *North Carolina Offshore Wind Capacity Assessment,* NATIONAL RENEWABLE ENERGY LABORATORY (NREL) (March 2024) at 1-2, attached hereto as Exhibit A.

[32] *First BOEM NC Renewable Energy Task Force Meeting (January 2011)*, BUREAU OF OCEAN ENERGY MANAGEMENT (BOEM), https://www.boem.gov/renewable-energy/state-activities/first-boem-nc-renewable-energy-task-force-meeting-january-2011 (last visited May 21, 2024).

[33] Press Release, U.S. Department of the Interior, Interior Department Auctions Over 122,000 Acres Offshore Kitty Hawk, North Carolina for Wind Energy Development (Mar. 16, 2017), https://www.doi.gov/pressreleases/interior-department-auctions-over-122000-acres-offshore-kitty-hawk-north-carolina-wind.

Virginia starting in July 2022.[34] Congress reversed this moratorium for offshore wind in 2022 as part of the Inflation Reduction Act ("IRA").[35] Although the IRA passed on party lines, the reversal of the South Atlantic wind moratorium had bipartisan support within North Carolina's congressional delegation.[36] In the interim, and after over a decade of public engagement, in May 22 BOEM auctioned two leases in Carolina Long Bay that were won by TotalEnergies and Duke Energy.[37]

Q: WHAT IS THE STATUS OF THESE FOUR BOEM LEASES?

A: Avangrid has submitted a permit application, known as a Construction and Operations Plan or COP, to BOEM for its Kitty Hawk North lease; it is currently under review[38] Avangrid has submitted a COP for its Kitty Hawk South lease, but must provide additional data before BOEM will review it. Neither TotalEnergies nor Duke Energy have developed COPs for their respective leases. The reason for the lack of progress on these leases is discussed further in the next section of my testimony. None of these leases has a contract to sell their power into the U.S. electrical grid.

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[34] Memorandum on Withdrawal of Certain Areas of the United States Outer Continental Shelf From Leasing Disposition, Administration of U/S. President Donald J. Trump, 2020DCPD202000726, https://www.govinfo.gov/content/pkg/DCPD-202000726/pdf/DCPD-202000726.pdf (last visited May 21, 2024).

[35] P.L. 117-169, Section 50251(a), reversing wind leasing bans issued by President Trump in September 2020 under authority provided by Section 12(a) of the OCSLA (43 U.S.C. §1341(a)).

[36] https://ross.house.gov/2022/7/representatives-ross-tonko-rouzer-provision-repeal-10-year-offshore-wind.

[37] Renewable Energy, *North Carolina Activities*, BUREAU OF OCEAN ENERGY MANAGEMENT (BOEM), https://www.boem.gov/renewable-energy/state-activities/north-carolina-activities (last visited May 21, 2024).

[38] Renewable Energy, *Kitty Hawk North Wind Project,* BUREAU OF OCEAN ENERGY MANAGEMENT (BOEM), https://www.boem.gov/renewable-energy/state-activities/kitty-hawk-north-wind-project (last visited May 21, 2024).

Q: COULD ADDITIONAL BOEM LEASES BE ISSUED OFF NORTH CAROLINA?

A: Yes, the state could be the focus of future offshore wind leasing. BOEM included acreage adjacent to Avangrid's Kitty Hawk lease in areas under consideration for future leasing in its forthcoming Central Atlantic lease sale.[39] Although these areas didn't make it into the Central Atlantic lease sale that BOEM will be holding later this year,[40] BOEM has indicated that it will be re-reviewing the region for a potential second lease sale in the region that could include areas off North Carolina. BOEM has in the past considered further leasing south and west of the current Carolina Long Bay leases that could interconnect to North Carolina,[41] and increased state interest could result in these areas being reopened for consideration.

Q: WHAT HAS THE STATE OF NORTH CAROLINA DONE TO INCENTIVIZE OFFSHORE WIND?

A: North Carolina has taken tentative steps to encourage offshore wind to take root here. In 2018, Governor Roy Cooper directed the creation of a state Clean Energy Plan, which called for the creation of a regional offshore wind collaborative, a study of how the state's supply chain and infrastructure could accommodate offshore wind, and the advancement of legislative and regulatory actions to incentivize

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[39] Call for Information and Nominations— Commercial Leasing for Wind Power Development on the Central Atlantic Outer Continental Shelf (OCS), 87 Fed. Reg. 25539, https://www.govinfo.gov/content/pkg/FR-2022-04-29/pdf/2022-09036.pdf (Call Areas D and F).

[40] Atlantic Wind Lease Sale 10 for Commercial Leasing for Wind Power Development on the U.S. States Central Atlantic Outer Continental Shelf—Proposed Sale Notice, 88 Fed. Reg. 86145, https://www.govinfo.gov/content/pkg/FR-2023-12-12/pdf/2023-27200.pdf.

[41] Renewable Energy, *South Carolina Activities,* BUREAU OF OCEAN ENERGY MANAGEMENT (BOEM), https://www.boem.gov/renewable-energy/state-activities/south-carolina-activities, (last visited May 21, 2024); *South Carolina Call Areas*, BUREAU OF OCEAN ENERGY MANAGEMENT (BOEM), https://www.boem.gov/sites/default/files/renewable-energy-program/State-Activities/SC/sc-call-areas.pdf (last visited May 21, 2024).

offshore wind development.[42] Most of these three objectives have been accomplished: a Southeast and Mid-Atlantic regional partnership among North Carolina, Virginia, and Maryland was signed in 2020,[43] a supply chain study was conducted in 2021,[44] and HB951 was enacted in 2021. Now we are awaiting regulatory action from this Commission to ensure HB951 is implemented in a manner that will launch offshore wind in the state. Governor Cooper also issued an executive order calling for development goals of 2.8 GW by 2030 and 8 GW by 2040,[45] although as noted below, policy goals without mandatory implementation lack the certainty needed to spark concrete investment.

Q: HOW CAN OFFSHORE WIND BENEFIT NORTH CAROLINA'S ELECRICAL GRID?

A: A 2022 report by the Southeastern Wind Coalition lays out the ways offshore wind can benefit North Carolina and the hurdles to achieving those benefits.[46] As set forth in Figure 1, offshore wind can complement North Carolina's solar resources and bring diversity to the grid by helping to balance generation particularly when

[42] Executive Order NO 80, North Carolina Governor Roy Cooper (October 29, 2018), https://governor.nc.gov/documents/files/executive-order-no-80-north-carolinas-commitment-address-climate-change-and-transition-clean-energy/open.

[43] Press Release, North Carolina Governor Roy Cooper, Maryland, North Carolina, and Virginia Announce Agreement to Spur Offshore Wind Energy and Economic Development (Oct. 29, 2020), https://governor.nc.gov/news/press-releases/2020/10/29/maryland-north-carolina-and-virginia-announce-agreement-spur-offshore-wind-energy-and-economic.

[44] *Building North Carolina's Offshore Wind Supply Chain*: The roadmap for leveraging manufacturing and infrastructure advantages, NORTH CAROLINA DEPARTMENT OF COMMERCE (Mar. 20, 2021), https://files.nc.gov/nccommerce/documents/Policymaker-Reports/Report_North-Carolina-OSW-Supply-Chain-Assessment_BVGAssociates_asPublished-Mar3-2021.pdf.

[45] North Carolina Executive Order No. 218, Advancing North Carolina's Economic and Clean Energy Future with Offshore Wind (June 9, 2021), https://governor.nc.gov/documents/files/executive-order-no-218/open#:~:text=The%20State%20of%20North%20Carolina%20will%20strive%20for%20development%20of,and%208.0%20GW%20by%202040.&text=Section%202.,Clean%20Energy%20Economic%20Development%20Coordinator.

[46] *Cost-Benefit*, at 3-4.

loads are high in the region as well as at night when there is a need for supplemental power.[47] Robust offshore wind development will therefore help the state increase grid reliability.[48] Duke's Carbon Plan concedes this point, noting that offshore wind "has its highest seasonal generation on winter mornings" and emphasizing that "[a]s the peak planning hour has shifted to winter mornings, partially due to high solar integration, having capacity during those times is critically important, which is when offshore wind is consistently producing and peaking."[49]

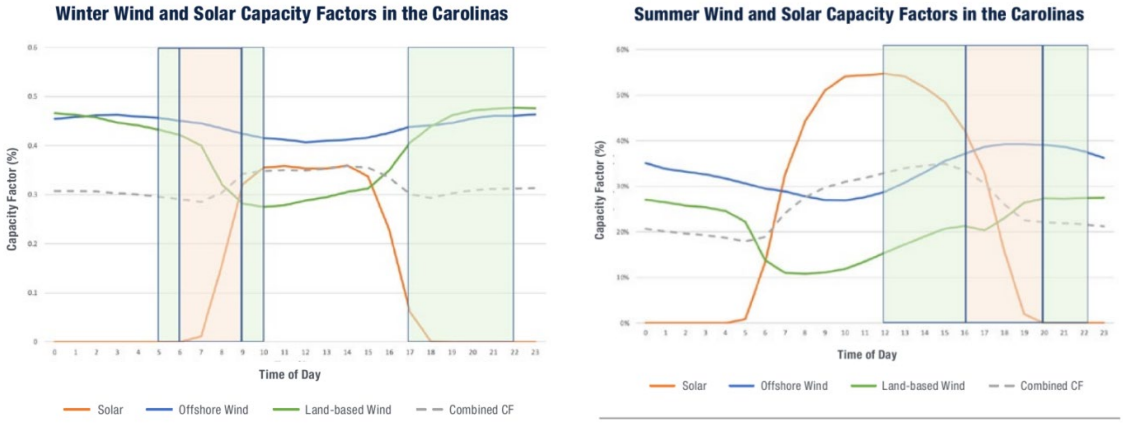

Figure 1 (Source: *North Carolina Offshore Wind Cost-Benefit Analysis*, SOUTHEASTERN WIND COALITION, 16 (January 2022)).

What is more, offshore wind helps protect the state's energy mix against the cost fluctuations from traditional fuel sources because it remains a "free source of clean energy."[50] The savings to utility customers from avoided fuel costs could be considerable. In Virginia, Dominion Energy calculated that its 2.6 GW Coastal

[47] *Id.* at 16-17.
[48] *Id.*
[49] *2023 Carolinas Resource Plan,* Appendix I, DUKE ENERGY at 29, https://www.duke-energy.com/-/media/pdfs/our-company/carolinas-resource-plan/appendix-i-renewables-and-energy-storage.pdf?rev=7f308696a4414ada89a3cd8524c00b63 [hereinafter *2023 Resources Plan*].
[50] *Cost-Benefit*, at 21.

Virginia Offshore Wind ("CVOW") project would result in a reoccurring annual savings of $300M—$3B in total over the course of 10 years—simply by not having to procure fuel for that amount of generation.[51]

Q: WHAT ARE SOME ECONOMIC BENEFITS TO THE STATE BEYOND THOSE THAT WOULD SHOW UP ON AN ELECTRICAL BILL?

A: The Southeastern Wind Coalition cost-benefit report estimated that a hypothetical offshore wind project of approximately 2.8 GW will bring a net economic benefit to Virginia of at least $3.7B.[52] Strong offshore wind development will have additional economic benefits through job creation (full-time equivalent positions) during construction, operations and maintenance, and as induced jobs created by spending of wages from direct offshore wind employment.[53] These benefits were echoed in a recent Avangrid study of the economic impacts the Kitty Hawk Wind Projects would have on Virginia, finding that the two projects would generate an estimated $4.8 billion economic impact in the state, supporting 12,166 cumulative jobs.[54] The report estimates that Virginia's state government would receive a cumulative tax revenue of about $112.8 million due to these projects.[55]

[51] *See* Press Release: Dominion Energy's Coastal Virginia Offshore Wind Project Achieves Another Major and On-time Milestone, DOMINION ENERGY (Oct. 31, 2023), https://news.dominionenergy.com/2023-10-31-Dominion-Energys-Coastal-Virginia-Offshore-Wind-Project-Achieves-Another-Major-and-On-time-Milestone; *see also* Virginia Electric and Power Company's Post-Hearing Brief and Issues Matrix, VIRGINIA STATE CORPORATION COMMISSION PUR-2021-00142, (June 24, 2022), at 57-60, https://scc.virginia.gov/docketsearch/DOCS/7%23%40_01!.PDF (discussing net positive customer benefits from CVOW).

[52] *Cost-Benefit*, at 12.

[53] *Id.* at 13-14.

[54] *Economic & Fiscal Impact: Kitty Hawk Wind Projects in Virginia*, CHMURA ECONOMICS & ANALYTICS (2023), Section 3.5, https://sewind.org/wp-content/uploads/2024/03/Kitty-Hawk-Wind-Economic-Impact-Study_March-2024-1.pdf.

[55] *Id.* at Section 4.4.

A state commitment to prioritizing offshore wind would also help North Carolina generate demand for offshore wind component production, which can help reduce costs and provide economic benefits to the state beyond generating electricity.[56] However, manufacturers are likely to locate in other states the longer North Carolina waits to make a clear commitment to offshore wind development.[57] As costs for offshore wind development continue to decline in the U.S., North Carolina should not pass up the clear opportunities for enhanced grid reliability and local economic benefits provided by offshore wind.

North Carolina has the advantage of two deepwater ports—Wilmington and Morehead City—with the potential to be offshore wind construction, operations, and manufacturing hubs.[58] A recent supply chain study found that locations adjacent to both ports were suitable for supporting offshore wind development in the state.[59] Since that study was issued, the state-run North Carolina Ports Authority has proposed redeveloping Radio Island off Morehead City as a multi-use offshore wind facility.[60]

Economic opportunities are not limited to just ports. One North Carolina company, Southwire, helped manufacture 32 miles of cable for Vineyard Wind 1, the first

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[56] *Id.* at 12.

[57] *Id.*

[58] *Building North Carolina's Offshore Wind Supply Chain: The roadmap for leveraging manufacturing and infrastructure advantages,* BVG ASSOCIATES LLC (2021) at 58-62, https://files.nc.gov/nccommerce/documents/Policymaker-Reports/Report_North-Carolina-OSW-Supply-Chain-Assessment_BVGAssociates_asPublished-Mar3-2021.pdf.

[59] *Id.* at 73-74.

[60] Gareth McGrath, *NC Ports proposes Morehead City site as hub for offshore wind industry*, USA TODAY NETWORK (April 28, 2022), https://www.starnewsonline.com/story/news/2022/04/28/morehead-city-proposed-offshore-wind-manufacturing-hub/7439460001/,

utility scale offshore wind farm off Massachusetts.[61] Nucor's steel mill in Hertford County currently supplies steel plates for onshore wind towers, but is capable of retooling for offshore towers.[62] And Saertex, Inc. in Huntersville, NC – weaves fiberglass into proprietary fabrics for various wind turbine blade manufacturers.[63] North Carolina is also home to several premier research universities that are well-positioned to gain significant grant funding related to offshore wind. Duke University, for instance, has already received $7.5M in DOE funding to study environmental impacts of offshore wind farms.[64] South Carolina is also benefiting from the offshore wind supply chain, as it is home to a Nexans subsea cable factory[65] and a wind turbine drive train testing facility just outside of Charleston.[66] In sum, North Carolina has four existing BOEM offshore wind leases containing up to 6.3 GW of anticipated energy generation that can interconnect into its grid, the possibility of more leasing in the future, plus substantial economic development

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61 *Vineyard Wind Announces US Based Southwire As Key Supplier for Nation's First Commercial Scale Offshore Wind Project,* VINEYARD WIND (2021), https://www.vineyardwind.com/press-releases/2021/4/12/vineyard-wind-announces-us-based-southwire-as-key-supplier-for-nations-first-commercial-scale-offshore-wind-project.

62 *Nucor Steel – Hertford Galvanizes Community, North Carolina Manufacturing,* NC CHAMBER (Feb. 7, 2024), https://ncchamber.com/2024/02/07/nucor-steel-hertford-galvanizes-community-north-carolina-manufacturing/.

63 Multiaxials Made in America, SAERTEX USA, LLC, https://saertex-usa.com/ (last visited May 21, 2024).

64 *$7.5M Grant Will Fund Study of Offshore Wind Energy's Impacts on Sea Life*, DUKE NICHOLAS INSTITUTE FOR ENERGY, ENVIRONMENT & SUSTAINABILITY (Oct. 15, 2021), https://nicholasinstitute.duke.edu/articles/75m-grant-will-fund-study-offshore-wind-energys-impacts-sea-life.

65 Christina Lee Knauss, *How this Charleston energy plant is powering homes on Long Island*, CHARLESTON REGIONAL BUSINESS JOURNAL (April 10, 2023), https://charlestonbusiness.com/how-this-charleston-energy-plant-is-powering-homes-on-long-island/#:~:text=In%20February%2C%20special%20heavy%2Dduty,power%2070%2C000%20homes%20in%20the.

66 Wind Turbine Test Beds: The World's Most Advanced Wind-turbine Drivetrain Testing Facility, CLEMSON, https://www.clemson.edu/innovation-campuses/charleston/energy/wind-turbine-test-beds.html (last visited May 22, 2024).

opportunities flowing from these leases. As discussed below, the primary missing ingredient is a market for this electricity.

IV. Duke's Proposed Carbon Plan Lacks Needed Certainty

Q: MR. KAPLOWITZ, WHY DO YOU BELIEVE DUKE'S PROPOSED CARBON PLAN IS INSUFFICIENT WITH RESPECT TO THE MECHANISM FOR DUKE ENERGY TO PROCURE OFFSHORE WIND ENERGY?

A: Duke's January 2024 supplemental filing represents a marked improvement over its 2023 plan because it now includes 2.4 GW of offshore wind in its preferred path, but it is still insufficient because it does not provide certainty to North Carolina offshore wind lessees that they will be able to sell energy from their leases into the state's electrical grid. Instead, Duke proposes an unnecessarily duplicative process, while leaving undetermined the prospect of future electricity procurement. Absent an order from this Commission mandating a path to market, projects will continue to stagnate because North Carolina's offshore wind developers will receive no signal that it will be able to finance their projects.

By proposing to continue studying offshore wind and not procure it, Duke has it backwards. Duke Energy, and by extension this Commission, are the catalysts for an offshore wind industry. Doing nothing and hoping for results becomes a self-fulfilling prophecy: no certainty means no progress on projects, and no progress makes it that much harder to meet HB951's mandates—particularly in light of Duke's own forecasts for rapidly increasing load demand in the state.

Instead, the Commission should order Duke to provide a mechanism that can lead to contractual certainty for all North Carolina leases as soon as possible. And in order to ensure progress is made on these projects between now and then, the Commission should immediately authorize Duke Energy to recover, on the behalf of the offshore wind developers, the considerable costs of preparing their state and federal permit applications.

Q: WHAT DO YOU MEAN BY CONTRACTUAL CERTAINTY?

A: By "contractual certainty," I mean any of a range of legal instruments that ensure that a project can provide power into the electrical grid in a manner that allows the project to be financed and constructed. There are numerous mechanisms that can be employed to achieve this outcome; the "best" one may vary depending on the circumstances—including state regulatory requirements.

Q: WHY IS CONTRACTUAL CERTAINTY A CONDITION PRECEDENT TO DEVELOPMENT OF OFFSHORE WIND PROJECTS?

A: Offshore wind derives almost entirely from up-front capital, labor, and permitting investments. Developers cannot (and should not) make these investments without certainty that they will be able to sell the resulting energy at a rate, and for a duration, that will allow it to recoup the costs and secure a sufficient return on those investments.[67] This is true whether the developer is in a regulated energy market, is itself the regulated utility, or is in a competitive energy market. As discussed above, offshore wind in the United States is not yet considered the lowest cost form

[67] *Pathways to Commercial Liftoff: Offshore Wind*, DEPARTMENT OF ENERGY (April 2024), at 55-56, https://liftoff.energy.gov/wp-content/uploads/2024/04/LIFTOFF_DOE_OFFSH_v13.pdf [hereinafter *Commercial Liftoff*].

of energy, largely because it does not yet have a mature supply chain and many of its benefits result from externalities that are not yet fully internalized.[68] Therefore, this contractual certainty must be backed by state-driven mandates to develop offshore wind energy.[69] Once those policies are in place, however, offshore wind development can and will occur.

These procurement policy instruments are critical to ensuring financial certainty for developers and can help generate lower-cost financing for projects in the long term and make the pipeline more durable.[70] The timing of contractual certainty also matters, because the sooner an offshore wind developer is able to enter into contracts for vessels and project components (e.g., foundations, towers, nacelles, blades, cables, and electrical substations), the better able they are to lock in costs and hedge against inflation and other market changes.[71] According to a new report from the Department of Energy, procurement (or demand) certainty "is critical to unlock private investment" because "a clear OSW procurement schedule lets industry optimize project timelines and sizes and create smooth demand pipeline for supply chain investment."[72]

Offshore wind development on the East Coast is living proof of these principles: every single offshore wind project that has advanced past the planning stage has done so because it has first secured a long-term contract for its energy production.[73]

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68 *Id.* at 41-43.

69 *Id.* at 32; *see also* Philipp Beiter et al., *Comparing Offshore Wind Energy Procurement and Project Revenue Sources Across U.S. States*, NATIONAL RENEWABLE ENERGY LABORATORY (NREL) (June 2020), at 22-23, https://www.nrel.gov/docs/fy20osti/76079.pdf [hereinafter *Wind Procurement*].

70 *Wind Procurement,* at 23, 26.

71 *Commercial Liftoff,* at 31-32.

72 *Id.*

73 *See* Table 1 above, Table 2 below.

In other words, first the contract is awarded, then the project is developed. Conversely, delaying contractual certainty—or establishing only unenforceable policy goals—means delaying development. This is the common thread for both competitive and regulated energy markets between Maine and North Carolina, and it is true even though states may vary in their approaches.[74]

Q: CAN YOU GIVE US AN EXAMPLE OF A STATE WHERE THIS CERTAINTY HAS BEEN EFFECTIVE IN CATALYZING OFFSHORE WIND DEVELOPMENT?

A: Virginia has positioned itself as a key innovator in offshore wind that can and should serve as a model for North Carolina. In 2020, Virginia enacted the Virginia Clean Economy Act ("VCEA"), which required the state's two utilities, Dominion Energy Virginia ("Dominion") and American Electric Power to produce electricity from 100 percent renewable sources by 2045 and 2050, respectively.[75] To help achieve this goal, the law declares that it is in the "public interest" that the state's utilities purchase or construct offshore wind facilities that have the capacity to generate an aggregate of 5.2 GW by 2034.[76] The 5.2 GW mandate essentially doubled Virginia's initial nonbinding state "goal" and Dominion's initial plan to develop 2.6 GW by requiring the utility to make a more long-term commitment.[77]

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74 *Wind Procurement*, at 22-23.

75 HB 1526 electric utility regulation, Virginia Clean Economy Act, Summary as Passed, VIRGINIA'S LEGISLATIVE INFORMATION SYSTEM, https://lis.virginia.gov/cgi-bin/legp604.exe?201+sum+HB1526S, (last visited Mar. 12, 2024), [hereinafter Summary of VCEA].

76 *Id.*

77 *See* Ross Davidson, *Virginia to set ambitious offshore wind goal,* WINDPOWER MONTHLY (Feb. 24, 2020), https://www.windpowermonthly.com/article/1674887/virginia-set-ambitious-offshore-wind-goal; V*irginia legislators agree 5.2GW offshore goal*, RENEWS. BIZ. (Feb. 14, 2020), https://renews.biz/57954/virginia-legislators-agree-52gw-offshore-goal/.

The VCEA provides financial certainty to both utilities and their customers by requiring Virginia's State Corporation Commission ("SCC") to authorize that Dominion to recover certain offshore wind investments.[78] The SCC must also contain customer costs, including by capping the recovery costs of any offshore wind projects.[79]

Backed by this certainty, Dominion is currently constructing the CVOW project, consisting of 176 wind turbines off the coast of Virginia that will generate 2.6 GW.[80] The SCC gave final approval for this project, which is the largest project in Dominion's history, in December of 2022, and authorized Dominion to recover a portion of its costs with rate adjustments.[81] Dominion has already made notable progress toward CVOW construction and implementation. In January 2024, BOEM approved the construction and operations plan for CVOW.[82] Dominion commenced offshore construction one week ago by installing its first monopile.[83] The CVOW project is expected to be fully constructed and delivering 2.6 GW to the grid by the end of 2026.[84] And Dominion is also constructing the only U.S.-built and flagged wind turbine installation vessel to use for CVOW and other

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78 Summary of VCEA, at (v).

79 Virginia Assembly Member Richard "Rip" Sullivan, March 5, 2020, Virginia House of Delegates floor consideration of HB 1526, the Virginia Clean Economy Act, available at https://virginiageneralassembly.gov/house/chamber/chamberstream.php [hereinafter VCEA Floor].

80 Order on Reconsideration, Case No. PUR-2021-00142 VIRGINIA STATE CORPORATION COMMISSION, (Dec. 15, 2022), at 3-4 [hereinafter [Order on Reconsideration].

81 *See generally* Order on Reconsideration; Charlie Paullin, *Virginia regulators approve offshore wind settlement*, VIRGINIA MERCURY (Dec. 15, 2022), https://virginiamercury.com/2022/12/15/regulators-approve-offshore-wind-settlement/.

82 Renewable Energy, Coastal Virginia Offshore Wind**,** BUREAU OF OCEAN ENERGY MANAGEMENT (BOEM), https://www.boem.gov/renewable-energy/state-activities/CVOW-C (last visited May 22, 2024) [hereinafter Virginia Offshore Wind].

83 Dominion Energy Installs First Monopile at CVOW, Theodore Reed-Martin, ENERGY GLOBAL (May 23, 2024), https://www.energyglobal.com/wind/23052024/dominion-energy-installs-first-monopile-at-cvow/.

84 *See* Virginia Offshore Wind**.**

subsequent U.S. projects.[85] CVOW is a first of its kind project that illustrates the clear commitment from Virginia lawmakers, regulators, and Dominion to implement large-scale offshore wind generation.[86]

Virginia's approach provides certainty to the utilities that the state is committed to at least 5.2 MW of offshore wind, with guaranteed cost recovery, which has helped generate investments and buy-in from a variety of stakeholders. Specifically, the SCC approved a construction cost-sharing mechanism—proposed by Dominion and consumer stakeholders[87]—where Dominion agrees to pay 50 percent of the cost of the project if it exceeds its expected $9.8 billion target, and agrees to pay 100 percent of the costs if they exceed $13.7 billion.[88] But first, Dominion has to seek and receive approval from the SCC for any incremental costs, which incentivizes the Dominion to avoid cost overruns.[89]

The North Carolina General Assembly mandated the decarbonization of the state's electrical grid through HB951, but in contrast with the VCEA, it delegated to this Commission the task of determining the mix of generation needed to achieve these targets.[90] These differences aside, SCC's path to cost recovery for Dominion's CVOW project is a model that this Commission should consider to provide North

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85 Final Order, Case No. PUR-2021-00142, VIRGINIA STATE CORPORATION COMMISSION (Aug. 15, 2022), at 3-4 [hereinafter Final Order].

86 Final Order, at 6-7.

87 *See* Second Proposed Stipulation and Recommendation, approved in the Order on Reconsideration, PUR-2021-00142, VIRGINIA STATE CORPORATION COMMISSION (Oct. 28, 2022) [hereinafter Second Stipulation].

88 *Id.* at 11.

89 *Id.* at 12.

90 H.B 951, "Energy Solutions for North Carolina," 2021-2022 Session, Gen. Assemb., SL 2021-165 (N.C. 2021), at Part 1, Section 1 [hereinafter H.B. 951].

Carolina's three offshore wind leaseholders with the confidence they need to forge ahead with development of their leases.

Q: WHAT EFFECT WOULD CONTRACTUAL CERTAINTY HAVE ON THE OFFSHORE WIND PERMITTING PROCESS?

A: Contractual certainty is necessary to prepare permits—a time- and resource-intensive process that must be completed before a project can be constructed and generate energy into the grid. Offshore wind development has a long lead time.[91] Delayed contractual certainty means delayed permitting, which in turn translates to delayed deployment.

The federal permits alone, primarily the COP submitted to BOEM for its review, requires tens of millions of dollars in geophysical and geotechnical surveys to map out the seabed for purposes of assessing geological conditions for project engineering, as well as the presence of subsea habitat, archaeological resources, and unexploded ordnance. This is in addition to dozens of other studies required to assess effects on wildlife, historical properties, fisheries, navigation, air and water quality, and other resources and ocean uses.[92] Just as they will not procure components without contractual certainty, developers will also wait until they have

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91 *2023 Resources Plan,* at 30.

92 *See, e.g.,* Renewable Energy, CVOW Construction and Operations Plan, BUREAU OF OCEAN ENERGY MANAGEMENT (BOEM),https://www.boem.gov/renewable-energy/state-activities/cvow-construction-and-operations-plan (last visited May 22, 2024). The specific costs of preparing a COP are commercially sensitive and may vary by project and contractor. It should be noted that in a recent court filing, the developer Vineyard Wind said it spent 10 years and $300 million to permit its Vineyard Wind 1 project. *See* Intervenor-Defendant Appellee's Brief in *Seafreeze Shoreside, Inc. et al. v. The United States Dep't of the Interior*, Cause No. 23-1853, in the U.S. Court of Appeals for the First Circuit, Doc. No. 118111836 (Feb. 22, 2024) at 1 (on file with the author).

contractual certainty to invest in permit preparation[93]—thereby stranding key energy generation assets at a time when the state is facing increased load demands and can ill afford to delay new carbon-free energy generation.

It can take roughly 5-6 years from the commencement of COP surveys to receipt of the final green light to allow construction to commence: 1-2 years of surveys to prepare the COP for submittal; up to a year from COP submittal to the start of BOEM's formal review; over 2 years of COP review and related environmental consultations; and up to an additional year of post-approval engineering and safety reviews. Waiting to provide contractual certainty has the effect of delaying project permitting timelines and deployment itself.

Q: HOW CAN THE COMMISSION ENSURE THAT THE PERMITTING PROCESS MOVES APACE WHILE DEVELOPERS AND DUKE WORK TO CREATE CONTRACTUAL CERTAINTY?

A: The Commission should issue an order allowing Duke to recover permitting costs for its own lease and those of other North Carolina developers. (Duke could, in turn, contract directly with the relevant permitting subcontractors or with the developers themselves.) This cost recovery mechanism would serve as a "bridge" to allow developers to accelerate investments in the permitting process even while they are waiting for contractual certainty, thereby minimizing additional delays in

[93] It bears note that Avangrid did submit a COP for its Kitty Hawk North project without having a contract for its energy. But this is the exception that proves the rule, because their COP review has stalled since it received a notice of intent to prepare an environmental impact statement in mid-2021. *See* Renewable Energy, Kitty Hawk North Wind Project, BUREAU OF OCEAN ENERGY MANAGEMENT (BOEM), https://www.boem.gov/renewable-energy/state-activities/kitty-hawk-north-wind-project (last visited May 22, 2024); Permitting Dashboard, Kitty Hawk North Wind Project, FEDERAL INFRASTRUCTURE PROJECTS, https://www.permits.performance.gov/permitting-project/fast-41-covered-projects/kitty-hawk-north-wind-project (last visited May 22, 2024).

offshore wind deployment while the path to wind energy area procurement is determined. Accelerated surveys could also help developers provide more accurate design and cost proposals to Duke if and when a procurement process is launched. Because such cost recovery would allow projects to proceed more quickly and with better information during a procurement process, this up-front investment would save ratepayers at least as much money in the long run. Recovery of permitting costs to enable the three North Carolina offshore wind developers to keep their projects on a path to more proximate deployment is therefore reasonable and proportionate.[94]

Q: DOES THE TIMING OF CONTRACTUAL CERTAINTY AFFECT THE BENEFITS A PROJECT CAN RECEIVE UNDER THE INFLATION REDUCTION ACT?

A: Providing contracting certainty as soon as possible would improve the North Carolina supply chain's ability to take advantage of time-limited advanced manufacturing tax credits provided under the Inflation Reduction Act of 2022 ("IRA"). Further delays could push developers' procurement of components past 2029, when this tax credit begins to phase out. And any delays could increase uncertainty regarding the availability of other IRA tax credits.

The IRA added Section 45X to the U.S. tax code, which provides a tax credit for the domestic production of certain eligible renewable energy components, including—as relevant to the offshore wind industry—wind turbine blades,

[94] *See 2023 Resources Plan,* Appendix J at 18; *2023 Resources Plan,* Supplemental Planning Analysis at 54.

nacelles, towers, offshore foundations, offshore wind vessels.[95] Makers of subcomponents wouldn't directly benefit from the 45X credit, but for the duration of the credit they would benefit immensely from the boost provided by component manufacturers.[96] The exact amount of the credit depends on the rating of the wind turbine, but most relevant to this proceeding is the fact that these credits are subject to a gradual phase-out between the end of 2029 and the end of 2032.[97] The credit can be claimed only once production and the sale have been completed, so eligible North Carolina manufacturers will not be able to claim the full credit for purchase orders from North Carolina developers (or benefit from orders of subcomponents from direct recipients of the credit) unless the procurement and production of components takes place before 2030.[98]

The IRA also provides the investment tax credit ("ITC") of between 30-50% for offshore wind facility construction that every North Carolina developer expects to qualify for and would benefit North Carolina utility customers. This credit faces a phase-out of 2032 or until greenhouse gas ("GHG") emissions from the electrical sector are 25% of what they were in 2022, whichever is later.[99] It is widely assumed that the credit will continue beyond this phase-out deadline because the electrical sector is unlikely to achieve the statutorily prescribed GHG target until several years after 2032. However, the longer that offshore wind construction is delayed past

[95] *See* Notice of proposed rulemaking and public hearing: Section 45X Advanced Manufacturing Production Credit, 88 Fed. Reg. 86844 (December 15, 2023) (to be codified at 26 C.F.R. pt. 1), https://public-inspection.federalregister.gov/2023-27498.pdf.
[96] *Id.* at 11.
[97] *Id.* at 3-4.
[98] *See Id.* at 11.
[99] Pub. L. No. 117-169, 136 Stat. 1818, 26 U.S.C. 48E, Section 13702.

2032, the more uncertainty is introduced into the project finance equation—thereby adversely affecting project costs and ratepayer impacts.

Q: DOES DUKE'S PROPOSED ARFI PROVIDE THE CERTAINTY YOU SAY IS NEEDED?

A: Duke's Plan does not propose a sufficient path to market certainty. This continued lack of certainty for offshore wind in North Carolina is unsustainable and could lead to deployment delays well in excess of the number of years Duke postpones a procurement commitment, developers looking elsewhere for a path to market, or abandonment of the North Carolina leases altogether.

Duke has sought approval from this Commission to spend $1.4 million between early 2025 and 2026 to conduct an ARFI "to provide a structure in which the WEA lessees can provide more detailed information regarding proposed acquisition structures (including proposed acquisition or development fees, structures to ensure financing and construction capability, payment structuring and risk sharing), along with updated pricing."[100] Duke would then present the completed results of the ARFI to the Commission "to facilitate the consideration of further action."[101] On April 17, 2024 the Public Staff requested the Commission issue an order "requiring the Companies to proceed with the development and issuance of the ARFI on an expedited basis."[102] This Commission denied that request in a May 6, 2024 order,

[100] *2023 Carolinas Resource Plan,* Supplemental Planning Analysis, at 53-54.
[101] *Id.*
[102] Public Staff's Motion Requesting Issuance of Commission Order, Docket No. E-100, SUB 179; E-100, SUB 190, NORTH CAROLINA UTILITIES COMMISSION (April 17, 2024) (available at) https://starw1.ncuc.gov/NCUC/ViewFile.aspx?Id=813ef5e8-aff0-44a6-9045-d3ed5383e0a9.

largely on the basis that it had not yet had the opportunity to hear evidence and arguments from the parties to this proceeding.[103]

Even in an expedited form, however, the ARFI is not fully or even partially formed and contains no enforcement mechanism or other assurances that would lead to power procurement, meaning any progress in this direction could be reversed by Duke or the Commission in the next biannual review. Duke's supplemental filing acknowledges as much, anticipating that "[i]n parallel" with their response to the ARFI, developers would "continue limited early project development and engineering work on the related transmission *while not taking definitive actions prematurely*."[104] This position disregards that early project development requires the very market certainty that Duke has failed to propose.

Without a clear endpoint, the proposed ARFI may end up being a rerun of the 2023 request for information ("RFI") that Duke conducted under a contracted with DNV.[105] Duke criticizes its own 2023 RFI in its supplemental filing, noting that it "did not result in definitive feedback from the WEA lessees regarding key variables that will shape and define a future potential acquisition of an offshore wind generating facility."[106] But a lack of "definitive feedback" is exactly what one would expect in response to an RFI that was not tethered to concrete action (i.e., a procurement process) that would anchor offshore wind developers' proposals and cost estimates

[103] Order Denying the Public Staff's Motion to Expedite Offshore Wind Acquisition Request for Information, Docket No. E-100, SUB 179; E-100, SUB 190, NORTH CAROLINA UTILITIES COMMISSION (May 6, 2024) (available at) https://starw1.ncuc.gov/NCUC/ViewFile.aspx?Id=19b7aa72-62f8-4951-9d64-dd07783116c9.

[104] *2023 Carolinas Resource Plan,* Supplemental Planning Analysis, at 53 (emphasis added).

[105] Long-Lead Generation and Pumped Storage Hydro Panel Exhibit 1, Docket No. E-100, SUB 190 (Confidentially filed).

[106] *Id.*

in a realistic timeline with a mandatory endpoint. Duke now proposes another fact-finding initiative, the ARFI, that continues to push contractual certainty into the indefinite future. Unless this Commission insists on tying future RFIs to a procurement, Duke may continue to be dissatisfied with the feedback it gets from lessees—and continue to run out the clock.

Regardless, "definitive feedback" is simply not needed today for Duke and this Commission to provide contractual certainty. Right now, this Commission can order Duke to provide a contractual mechanism to ensure the construction of a given amount of offshore wind energy within a given year as part of its final Carbon Plan, and grant Duke the flexibility to work with the three developers to determine the optimal mechanism to achieve these objectives. Instead, Duke seeks additional time to gather an indeterminate amount of information before (maybe) seeking this Commission's approval to buy offshore wind energy.

Duke has shown itself to be capable of setting a more detailed and prescriptive schedule for the deployment of other newer technologies. For example, the same Supplemental Planning Analysis set forth a detailed plan for executing Duke's advanced nuclear strategy that includes a rigorous schedule of near-term (2023-2026) and intermediate term (2027-2032) actions.[107] Duke should be able to commit to an offshore wind procurement schedule with at least this level of detail and certainty, given that (a) the industry is much further advanced in the U.S. and globally than advanced nuclear,[108] and (b) unlike advanced nuclear, we know

[107] 2023 Carolinas Resource Plan, Supplemental Planning Analysis, at 54-55.

[108] Upon information and belief, North Carolina Sustainable Energy Association ("NCSEA") is sponsoring testimony that touches on nuclear issues in the CPIRP, including long lead development and comparisons to offshore wind.

exactly where the first 4.4-6.3 GW of offshore wind projects will be sited off North Carolina.

Q: WHAT ARE OTHER RISKS ASSOCIATED WITH A CONTINUED DELAY REGARDING CONTRACTUAL CERTAINTY?

A: Continued inaction on contractual certainty will likely delay offshore wind deployment for far longer than just the length of time that Duke postpones a procurement process. One key reason is widespread shortages and bottlenecks in the domestic and global supply chain for offshore wind vessels and project components, particularly as countries around the world ramp up their offshore wind goals.[109] North Carolina developers, lacking a path to market, can't yet get in the queue to charter one of a very few specialized offshore wind turbine installation vessels; purchase HVDC substations; or get a production slot in a limited number of offshore tower, blade, or foundation factories. Waiting two or more years to make these investments could put North Carolina developers behind dozens of other projects worldwide that all have the necessary contractual certainty to proceed, compounding delays. A similar dynamic is at play with permitting; Avangrid's COP approval timeline has move further and further to the right as other projects with better prospects jump ahead of it in line and capture more of federal agencies' permitting limited resources.[110]

Capital expenditures on major renewable energy projects are fungible and global. A developer facing insurmountable barriers in one region or country will decide to

[109] GWEC 2024 Report, at 46-47.

[110] Permitting Dashboard, Kitty Hawk North Wind Project, FEDERAL INFRASTRUCTURE PROJECTS, https://www.permits.performance.gov/permitting-project/fast-41-covered-projects/kitty-hawk-north-wind-project (last visited May 22, 2024).

abandon it altogether and direct their time and energy to projects in more favorable regulatory environments. If this Commission does not order Duke to commit to something more concrete than its proposed ARFI, there is a very real risk that North Carolina's offshore wind developers could run out of patience and invest elsewhere.

Q: DO YOU HAVE AN EXAMPLE OF WHAT CAN HAPPEN WHEN NORTH CAROLINA PROVIDES CONTRACTUAL CERTAINTY TO A GROWING RENEWABLE ENERGY INDUSTRY?

A: Yes, the trajectory of solar development in this state over the past two decades shows what can happen when North Carolina—and this Commission—decides to be a "second mover" with a renewable energy technology. As recently as 2009, North Carolina lagged behind ten states in solar energy generation.[111] But the state super-charged solar development with a combination of key policy choices: a 2007 renewable portfolio standard,[112] a generous state installation tax rebate program, and this Commission's requirement that contracts to be offered to qualified solar facilities of 5 megawatts (MW) or less.[113] A decade later, in 2019, North Carolina was ranked number two nationally in new solar installations,[114]and as of 2022 ranked fourth nationally in solar power generation and installed solar generating

[111] In 2009, North Carolina was ranked 11th in total solar capacity and 10th in new solar capacity. *2009-2010 Annual Report*, NORTH CAROLINA SUSTAINABLE ENERGY ASSOCIATION, (2010), https://energync.org/wp-content/uploads/2017/03/NCSEA_Annual_Report_2010.pdf.

[112] Renewable Energy and Energy Efficiency Portfolio Standard (REPS), NORTH CAROLINA UTILITIES COMMISSION, https://www.ncuc.gov/Reps/reps.html#:~:text=Under%20this%20new%20law%2C%20investor,to%20a%2010%2%E2%80%8E%E2%80%8E5%20REPS%20requirement.%E2%80%8E (last visited May 22, 2024).

[113] Analysis of House Bill 589, Legislative Analysis Division, N.C. Gen. Assemb. (June 6, 2017), https://webservices.ncleg.gov/ViewDocSiteFile/48271; *North Carolina House Bill 589*, NORTH CAROLINA SUSTAINABLE ENERGY ASSOCIATION, https://energync.org/hb589/ (last visited May 22, 2024).

[114] *Top 10 Solar States,* SOLAR ENERGY INDUSTRIES ASSOCIATION (2019), https://www.seia.org/sites/default/files/2020-03/SEIA_Top10_Solar_States_2019-YIR.pdf.

capacity. [115] While this surge has tailed off a bit in recent years as a result of the withdrawal of some of the aforementioned policies, the solar industry is still at a level of maturity that gives Duke the confidence to rely on it for 20% of its 70% carbon reduction mandate in the Carolinas.[116]

V. 2.4 GW of Offshore Wind Can Be Delivered By 2032

Q: MR. KAPLOWITZ, WHAT IS YOUR OPINION ON DUKE ENERGY'S PROPOSED 2035 DELIVERY DATE FOR 2.4 GW OF OFFSHORE WIND ENERGY?

A: It would be feasible for 2.4 GW of offshore wind to be delivered to the North Carolina grid by 2032. 2035 is an unnecessarily late deadline that amount of offshore wind to be in-service—and risks projects failing to take advantage of certain Inflation Reduction Act tax credits.

Each North Carolina offshore wind energy area is owned by sophisticated energy developers who are capable of delivering completed offshore wind projects if given a ready market for their electrons. While TotalEnergies and Avangrid have their own estimated timelines based on their extensive experience in this space, it is also worthwhile to consider the development timelines for the first six commercial-scale offshore wind projects in the United States set forth in Table 2:

[115] North Carolina State Profile and Energy Estimates, U.S. ENERGY INFORMATION ADMINISTRATION (last updated Feb 15, 2024), https://www.eia.gov/state/analysis.php?sid=NC

[116] *2023 Carolinas Resource Plan,* Supplemental Planning Analysis, at 39 (Table SPA 3-2: Modeled Energy Mix, Combined Carolinas System).

Table 2: Timelines of First US Offshore Wind Projects[117]							
Project	**Date of COP submittal**	**Contractual Certainty**	**COP approval**	**Onshore Construction Start**	**Offshore Construction Start**	**Actual/ Anticipated power delivery**	**Approximate time from contract to full power**
Vineyard Wind 1[i]	Dec. 2017	Late 2018 (from MA)	May 2021	May 2021	Late 2022	800 MW in late 2024	6 years
South Fork Wind Farm	June 2018[ii]	Nov. 2018 (from NY-LIPA)[iii]	Jan. 2022[iv]	Feb. 2022[v]	Fall 2022	1312 MW in March 2024[vi]	5.5 years
Revolution Wind	March 2020[vii]	2018 & 2019 (from CT and RI)[viii]	Nov. 2023[ix]	Late 2023[x]	Spring 2024	704 MW in 2025	6 years
Coastal Virginia Offshore Wind	Dec. 2020[xi]	April 2020 (VCEA passage)[xii]	Jan. 2024[xiii]	Nov. 2023[xiv]	Spring 2024[xv]	2,600 MW in 2026	6 years
Empire Wind 1	Jan. 2020[xvi]	Oct. 2019 (from NY; won rebid contract in Feb. 2024)[xvii]	March 2024[xviii]	2024[xix]	2025	812 MW in 2027[xx]	8 years
Sunrise Wind	Sept. 2020[xxi]	Oct. 2019 (from NY; won rebid contract in Feb. 2024)[xxii]	March 2024[xxiii]	2023[xxiv]	2025	924 MW in 2026[xxv]	7 years

[117] References for Table 2 are contained in the endnotes.

The timelines for these "first-mover" projects are longer than what might be anticipated for future projects. They have all been subjected to enhanced regulatory, commercial, and technical uncertainty and scrutiny, and several of these projects have been delayed by well-documented financial headwinds due to macroeconomic factors. For instance, the delivery dates for the Empire Wind 1 and Sunrise Wind 1 projects have been pushed back because unforeseen surges in inflation and interest rates caused them to need to withdraw from their initial power contracts,[118] although they were able to sign new and more economical contracts after the State of New York reissued a request for proposals.[119] But for this unusual confluence of adverse macroeconomic trends, all six of these initial projects would have likely seen the same 6-7 time period between contract award and full deployment.

Applying this rough timeframe, the first North Carolina offshore wind projects can go online by the end of 2032 if the Commission in late 2024 orders Duke to procure or develop 2.4 GW of offshore wind energy and allows Duke to recover permitting costs as a "bridge" to the award of specific contracts, and Duke finalizes project-specific power procurements in 2025. If eligible projects can capture even some of the economies of scale and efficiencies that typically come with repetition, that delivery date could happen even sooner.

This timeline is feasible even taking Duke's calculations on their own terms. In their supplemental submittal, Duke writes:

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[118] *US offshore wind projects facing inflation headwinds,* REUTERS (Nov. 1, 2023), https://www.reuters.com/sustainability/climate-energy/us-offshore-wind-projects-facing-inflation-headwinds-2023-09-11/.

[119] Eduardo Garcia, *New York auction highlights jump in US offshore wind prices,* REUTERS (Mar. 14, 2024), https://www.reuters.com/business/energy/new-york-auction-highlights-jump-us-offshore-wind-prices-2024-03-14/.

> Given the expected timeline to execute the ARFI and obtain further necessary approvals, it will likely not be possible to achieve a 2033 in-service date for the first 800-MW block of offshore wind as currently modeled in Fall P3 Base. However, a 2034 in-service date may be achievable assuming proposed NTAP actions progress.[120]

If the Commission eliminates the unnecessary two-year delay from the ARFI by ordering Duke to provide market certainty now, Duke's own estimate would allow for a 2031 or 2032 delivery of 800 MW. Additionally, the standard "unit" of offshore wind farm has evolved from 800 MW to 1200 MW, due largely to an increase in wind turbine sizes and the transition to high voltage direct current (HVDC) transmission, which can connect 1,200 MW with a single cable bundle.[121] This scale-up also reduces costs by creating additional economies of scale that will benefit North Carolina utility customers, as Duke itself acknowledged in its 2023 RFI analysis.[122] Thus, Duke should be thinking about 2.4 GW in terms of two 1200 MW projects, not three 800 MW projects.

A more aggressive timeline for first delivery of offshore wind would provide Duke more optionality in achieving its 70% decarbonization mandate in the event that other carbon-free resources fall short. Moreover, the early 2030s are exactly when Duke anticipates new natural gas power plants going online.[123] Adding 2.4 GW of offshore wind into the mix

[120] *2023 Carolinas Resource Plan,* Supplemental Planning Analysis, at 53.

[121] *Offshore Wind Transmission Study*, at 42 & 159. Appendix E of NREL's study lists candidate points of interconnection considered in the study as well as maximum cable capacities that illustrates this trend and the current capability to connect at least 1,200 MW. The previous standard for offshore wind transmission, high voltage alternating current (HVAC), maxes out at 900 MW for a single bundle; *see also* Brian Sergi et al., *Duke Energy Carbon-Free Resource Integration Study,* NATIONAL RENEWABLE ENERGY LABORATORY (NREL) (2022), at 46 https://www.nrel.gov/docs/fy22osti/82431.pdf (highlighting the availability of larger offshore wind turbines that increase capacity) [hereinafter *Carbon-Free Resources*].

[122] *2023 Carolinas Resource Plan*, Long-Lead Generation and Pumped Storage Hydro Panel Exhibit 1 (filed confidentially).

[123] *2023 Carolinas Resource Plan,* Supplemental Planning Analysis, at 55-57.

within this timeframe might allow Duke to delay or cancel one or more gas plants, thereby providing additional optionality for Duke and accelerating the grid decarbonization process. Just as important, an earlier infusion of offshore wind into the grid will set the stage for future growth of offshore wind as discussed in the next section, and provide additional optionality toward achieving the ultimate prize of net zero carbon by 2050. Finally, the earlier timeline will allow North Carolina's nascent offshore wind supply chain to get more of a head start as detailed above.[124]

It should also be noted that HB951 preempts concerns regarding these timelines by carving out a limited exception to the 2030-2032 deadline for 70% reductions for "construction of a... wind energy facility that would require additional time for completion due to technical, legal, logistical, or other factors beyond the control of the electric public utility, or in the event necessary to maintain the adequacy and reliability of the existing grid." The Commission should take comfort in the additional flexibility that the legislature has granted it in the event of unforeseen delays for this particular technology.

VI. Duke's Carbon Plan Should Have Larger Aggregate Offshore Wind Goals

Q: MR. KAPLOWITZ, WHAT IS YOUR OPINION ON DUKE ENERGY'S PROPOSED AGGREGATE GOAL OF 2.4 GW OF OFFSHORE WIND?

A: Duke Energy sells itself, the offshore wind industry, and North Carolina utility customers short by only planning for 2.4 GW of offshore wind by 2035 and no more. This "one shot" goal disregards the economies of scale that improve the value proposition for offshore wind

[124] This Commission should not adopt Duke's longer timeline solely for the purpose of "waiting out" the recent cost increases due to inflation and rising interest rates. As noted above, these are macroeconomic trends that affect the cost of every energy source. And even under the most aggressive timeline, developers likely wouldn't be in a position to make key procurement decisions until 2026 at the earliest— long enough in the future to make it difficult to extrapolate too much from current economic conditions.

to the detriment of North Carolina utility customers, fails to account for the optionality needed to attain HB951's carbon reduction mandates, strands multiple gigawatts of offshore wind lease acreage off the state, and disincentivizes up-front transmission planning and upgrades. These concerns can be averted if this Commission requires Duke to procure at least enough offshore wind energy, and within a reasonable timeframe, to ensure all North Carolina leases can be fully developed and delivering energy by the end of 2035. Duke should also begin to study the longer-term role of offshore wind in achieving carbon neutrality by HB951's statutorily mandated deadline of 2050.

Q: HOW CAN A LARGER AGGREGATE OFFSHORE WIND MANDATE REDUCE COSTS?

A: Offshore wind development costs are projected to decline once a robust domestic supply chain takes hold.[125] This supply chain primarily includes pre-assembly ports, vessel construction and operation, and manufacture of tier 1 components (foundations, towers, nacelles, blades, subsea cables) and subcomponents. These supply chain investments will not be made unless companies have line of sight to a pipeline of offshore wind projects that will reserve time at their ports, charter their vessels, and procure their parts.[126]

New utility scale offshore wind projects in the U.S. average more than 1 GW in capacity, and that project size is expected to grow with the size of wind turbines and electrical demand.[127] It is no accident that most states with offshore wind mandates have set them large enough to accommodate a project pipeline of multiple projects. As Figure 1 above

[125] SEWC 2022 at 15, citing Musial, W. (2018, February). Offshore Wind Resource, Cost, and Economic Potential in the State of Maine. National Renewable Energy Laboratory. https://www.nrel.gov/docs/fy18osti/70907.pdf

[126] *See* Commercial Liftoff, at 32 ("In addition to states' installation targets, a clear OSW procurement schedule lets industry optimize project timelines and sizes and create smooth demand pipeline for supply chain investment.").

[127] *NREL 2023 Market Report,* at 41, 69.

demonstrates, most of the states have mandated procurement goals that accommodate numerous full-scale offshore wind projects. (The states with smaller mandates—e.g. Rhode Island and Connecticut, have smaller populations and smaller electricity loads, are adjacent to states with larger mandates that they can "draft" off, and have begun to collaborate with other states on power procurement in any event.[128]) Massachusetts and New York's long-term planning goals are even more ambitious, and while they are not yet binding, they send a market signal that more contracts are on the way to further support investments made today. Virginia implemented a 5.2 GW mandate that was double what Dominion's first project could deliver in order to capture these economies of scale and attract business to the Port of Virginia. And the biggest supply chain investments so far are centered in states proximate to these project pipelines.

While North Carolina's developers can leverage the ports and manufacturing capabilities of other states, it is always better to have these facilities sited closer to the projects. As discussed above, there are numerous opportunities for North Carolina to attract supply chain investments. These investments would have the dual benefit of further reducing project costs and creating over 25,000 new jobs for North Carolinians.[129] But these benefits can only come if investors have line of sight toward a pipeline of projects that can keep the ports and factories humming.

By only proposing 2.4 GW of offshore wind without any further development in the pipeline, Duke sacrifices these benefits to its customers and the North Carolina workforce.

[128] *See* https://portal.ct.gov/Office-of-the-Governor/News/Press-Releases/2023/10-2023/Connecticut-Massachusetts-and-Rhode-Island-Sign-First-Time-Agreement-on-Offshore-Wind.

[129] SEWC cost benefit report at 13.

Q: IF THIS COMMISSION STOPS AT 2.4 GW, WHAT DOES THAT MEAN FOR THE NORTH CAROLINA LEASES' REMAINING GENERATING CAPACITY?

There are four BOEM offshore wind leases off the coast of North Carolina totaling over 230,000 acres with as much as 6.3 GW of energy generation capacity.[130] Stopping at 2.4 GW of offshore wind will risk stranding a large amount of offshore wind generation potential, wasting a valuable energy resource.

These four leases are the product of over a decade of analysis and public engagement to deconflict the ocean off North Carolina and find the areas most suitable for offshore wind development. These processes culminated in two federal auctions won by three highly experienced renewable energy developers. Two of the leases—the Carolina Long Bay leases belonging to TotalEnergies and a Duke Energy subsidiary— have no foreseeable options other than plugging into the North Carolina grid. Both of Avangrid's Kitty Hawk leases could theoretically send power to both Virginia and North Carolina, but they currently face hurdles in Virginia due in part to the lack of a requirement that Dominion purchase offshore wind energy competitively.

Given that North Carolina leases have up to 6.3 GW of energy generation capacity,[131] the delta represents as many as 3.9 GW of stranded offshore generation capacity—a suboptimal outcome given the forecast for skyrocketing load demand in the state. Stopping at 2.4 GW would effectively kill any projects that are left over and cannot find a market in other states. Failure to commit to purchase this electricity also represents a waste of a readily available and reliable clean energy resource, something that concerned Congress when it listed "prevention of waste" as one of the factors the U.S. Department of the Interior

[130] Exhibit A at 2.
[131] Exhibit A, at 2.

should consider in authorizing renewable energy development.[132] BOEM recently clarified in its renewable regulations that prevention of waste includes "economic waste and physical waste of energy resources from sources other than oil and gas"—in other words, offshore wind energy.[133] While creation of a market for wind energy generated on the Outer Continental Shelf is not a federal duty, this Commission should endeavor to harmonize its orders with federal law to the extent practicable by ensuring all North Carolina leases have a path to market.

Q: HOW WOULD A LARGER OFFSHORE WIND GENERATION GOAL HELP MEET HB951'S GOAL OF CARBON NEUTRALITY BY 2050?

A: The final percentages of carbon reduction to achieve net zero are widely understood to be the hardest, and NREL has found that North Carolina will need to harness every available resource to bring its grid over the finish line—including a healthy slice of the pie devoted to offshore wind.[134] Duke needs to preserve optionality by opening as many paths as possible today to achieve that mandate 26 years from now. Offshore wind energy must be one of those paths.

Q: COULD NORTH CAROLINA GET OFFSHORE WIND ENERGY BEYOND WHAT CAN BE GENERATED FROM EXISTING BOEM LEASES?

A: There are two reasons to believe that offshore wind off North Carolina does not need to stop with development of existing BOEM leases. The first is the availability of real estate. North Carolina has 301 miles of coastline, more than any East Coast state to its north.[135]

[132] 43 USC 1337(p)(4)(C) ("The Secretary shall ensure that any activity under this subsection is carried out in a manner that provides for... prevention of waste.").
[133] 30 CFR 585.102(a)(3); *see also* 89 FR 42602, 42647 (May 15, 2024).
[134] *See Carbon-Free Resources*, at ix, 33-34, 41, 43, 79.
[135] *List of U.S. states and territories by coastline*, WIKIPEDIA, https://en.wikipedia.org/wiki/List_of_U.S._states_and_territories_by_coastline (last visited May 22, 2024).

Thanks in large part to North Carolina's ample coastline, the Mid-Atlantic region has a technical potential to generate up to 147.4 GW.[136] BOEM's leasing processes are very sensitive to state demand. As Table 1 above makes plain, if a state establishes planning goals and mandates, BOEM leasing typically follows suit.[137] Therefore, one would anticipate that a Commission order that "goes big" on offshore wind will incentivize BOEM to include more leasing in its second Central Atlantic sale that it recently announced will take place in 2026[138]—and potentially beyond.

The second is the likely continuation of existing technological development trends in the industry that will expand the areas off North Carolina where offshore wind is technically feasible. HVDC transmission lines allow for offshore wind to be built further from shore.[139] The rapid commercialization of floating foundations allows for siting in ever deeper water.[140] And bigger wind turbines have larger rotor sweeps that can harvest more energy at lower wind speeds, such as those found in the South Atlantic off North Carolina.[141]

The supply chain will respond to indications that North Carolina has offshore wind ambitions beyond just buildout of existing leases. Investment is more likely if, for

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[136] Gabriel R. Zuckerman et al., *Impacts of Siting Considerations on Offshore Wind Technical Potential in the United States,* NATIONAL RENEWABLE ENERGY LABORATORY, at 13 (July 2023), https://www.nrel.gov/docs/fy23osti/85088.pdf.

[137] BOEM, in the proposed sale notice for its upcoming Gulf of Maine sale, cited the combined offshore wind goals of Massachusetts and Maine as a rationale for it ambitious proposed leasing map. Atlantic Wind Lease Sale 11 (ATLW–11) for Commercial Leasing for Wind Power Development on the U.S. Gulf of Maine Outer Continental Shelf—Proposed Sale Notice, 89 FR 35222, 35223, https://www.govinfo.gov/content/pkg/FR-2024-05-01/pdf/2024-09390.pdf.

[138] Press Release, Secretary Haaland Announces New Five-Year Offshore Wind Leasing Schedule, U.S. Department of the Interior (April 24, 2024), https://www.doi.gov/pressreleases/secretary-haaland-announces-new-five-year-offshore-wind-leasing-schedule. It is my understanding that BOEM may be considering further leasing along the entire North Carolina coast in advance of this 2026 sale.

[139] *NREL 2023 Market Report,* at 70, 119.

[140] *NREL 2023 Market Report,* at 70-73.

[141] *NREL 2023 Market Report,* at 75-79; Wind Turbines: the Bigger, the Better | Department of Energy.

example, port developers and their lenders and investors anticipate a decades-long pipeline of projects will keep them busy—as opposed to just a few projects over the next ten years.

Q: WHAT EFFECT WOULD A LARGER OFFSHORE WIND GENERATION GOAL HAVE ON TRANSMISSION PLANNING?

A larger offshore wind generation mandate and a commitment to longer-term goals would have the added benefit of facilitating better transmission planning, which in turn would reduce the cost of renewable energy for utility customers.

Even the base case of 2.4 GW of offshore wind will require onshore transmission upgrades to ensure integration into the grid along with an anticipated increase in solar generation in the eastern part of the state.[142] Setting a larger offshore wind target today will create optionality and incentivize more thoughtful and efficient planning in the region, which in turn will lead to lower net consumer costs for electricity.[143] This will also allow this Commission to get in front of the brand new transmission planning requirements contained in Order 1920 issued by the Federal Energy Regulatory Commission (FERC), which is expected to take effect by the end of the summer.[144] More robust transmission planning is also likely to require fewer new transmission lines in the long run, resulting in lower land use impacts and community opposition. Conversely, if North Carolina's offshore wind generation advances in a piecemeal and ad hoc manner, it will disincentivize long-term

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142 *Carbon-Free Resources,* at 36-38.

143 The evidence is overwhelming that advance transmission planning saves money for consumers. *See, e.g., Well-Planned Electric Transmission Saves Customer Costs: Improved Transmission Planning Is Key to the Transition to a Carbon-Constrained Future,* THE BRATTLE GROUP, WIRES (June 2016), https://wiresgroup.com/wp-content/uploads/2020/06/2016-06-Brattle-Group-Well-Planned-Electrical-Transmission-Saves-Customers-Costs.pdf; *Transmission Planning for the 21st Century: Proven Practices that Increase Value and Reduce Costs*, THE BRATTLE GROUP& GRID STRATEGIES (Oct. 2021), https://www.brattle.com/wp-content/uploads/2021/10/2021-10-12-Brattle-GridStrategies-Transmission-Planning-Report_v2.pdf,

144 Order No. 1920, 187 FERC ¶ 61,068 (2024) (available at), https://ferc.gov/media/e1-rm21-17-000.

transmission planning, delay needed upgrades that will more than pay for themselves over their lifespan, and complicate compliance with FERC Order 1920.

VII. Conclusion

Q: MR. KAPLOWITZ, WHAT ARE YOUR FINAL RECOMMENDATIONS TO THE COMMISSION?

The Commission's should:

- Require Duke to expedite the ARFI to reach its conclusions by late 2025.
- Require the late 2025 ARFI report to include the establishment of an offshore wind procurement mechanism and a schedule for when these procurements would occur and in what amounts. This mechanism could take numerous forms, but must contain a contractual structure sufficient to trigger the economic construction and operation of offshore wind within the leases off the state.
- Authorize Duke to recover reasonable costs for the three developers' permitting activities while projects await contractual certainty.
- Ensure that Duke's procurement process results in (1) deployment of 2.4 GW of offshore wind by 2032; and (2) the full buildout of existing North Carolina BOEM leases (roughly 4.4-6.3 GW) by 2035.
- In collaboration with stakeholders, study the role of offshore wind in achieving HB951's mandate for carbon neutrality by 2050, including (but not limited to): the potential for new BOEM leasing off the state's coast, the interplay with other carbon-free generation scenarios (particularly nuclear, onshore wind, battery, and solar), the quantity and cost of transmission upgrades needed, and the effect of an anticipated decline in costs due to the maturity of a domestic supply chain. This study will help

Duke preserve maximum optionality to work toward zero carbon, and will send a positive signal to the federal government and other key stakeholders regarding future leasing off North Carolina.

Q: DOES THIS CONCLUDE YOUR TESTIMONY?

A: Yes.

[i] *83C: Long Term Contracts for the Vineyard Wind 800 MW Wind Project Filed for DPU Approval,* MASSACHUSETTS CLEAN ENERGY (Aug. 1, 2018), https://macleanenergy.com/category/83c/.

[ii] Renewable Energy, Salt Fork, BUREAU OF OCEAN ENERGY MANAGEMENT (BOEM), https://www.boem.gov/renewable-energy/state-activities/south-fork (last visited May 22, 2024).

[iii] *South Fork Wind Farm*, LONG ISLAND POWER AUTHORITY (Oct. 2019), https://www.lipower.org/wp-content/uploads/2019/10/LIPA-First-Offshore-Wind-Farm-Doc-V19_102819-FINAL.pdf.

[iv] Renewable Energy, Salt Fork, BUREAU OF OCEAN ENERGY MANAGEMENT (BOEM), https://www.boem.gov/renewable-energy/state-activities/south-fork (last visited May 22, 2024).

[v] South Fork Wind Construction Archive, SOUTH FORK WIND, https://southforkwind.com/construction-archive (last visited May 22, 2024).

[vi] Press Release, Completion of South Fork Wind, First Utility-Scale Offshore Wind Farm in the United States Announced, NYSERDA (Mar. 14, 2024), https://www.nyserda.ny.gov/About/Newsroom/2024-Announcements/2024_03_14-Governor-Hochul-Announces-Completion-of-South-Fork-Wind.

[vii] Renewable Energy, Revolution Wind, BUREAU OF OCEAN ENERGY MANAGEMENT (BOEM), https://www.boem.gov/renewable-energy/state-activities/revolution-wind (last visited May 22, 2024).

[viii] Michelle Froese, *Connecticut regulators approve Revolution Wind power contract*, WIND POWER ENGINEER & DEV. (Dec. 20, 2018), https://www.windpowerengineering.com/connecticut-regulators-approve-revolution-wind-power-contract/; Nadja Skopljak, *Revolution Wind Gets Rhode Island Power Contract,* OFFSHOREWIND.BIZ (May 29, 2019), https://www.offshorewind.biz/2019/05/29/revolution-wind-gets-rhode-island-power-contract/.

[ix] Letter from Karen J. Baker, Office of Renewable Energy Programs, Bureau of Ocean Energy Management, to Peter Allen, Revolution Wind, November 17, 2023 (available at), https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/COP%20Appv%20Ltr_REV%20OCS-A%200486.pdf (Approving COP submitted by Revolution Wind).

[x] Press Release, Governor McKee Highlights Construction Progress on Revolution Wind – Rhode Island and Connecticut's First Utility-Scale Offshore Wind Farm, REVOLUTION WIND ((Nov. 16, 2023), https://revolution-wind.com/news/2023/11/rhode-island-and-connecticuts-first-utility-scale-offshore-wind-farm.

[xi] Renewable Energy, Coastal Virginia Offshore Wind, BUREAU OF OCEAN ENERGY MANAGEMENT (BOEM), https://www.boem.gov/renewable-energy/state-activities/CVOW-C (last visited May 22, 2024).

[xii] Summary of VCEA.

[xiii] Letter from Karen J. Baker, Office of Renewable Energy Programs, Bureau of Ocean Energy Management, to Mark Mitchell, Virginia Electric and Power Company, January 28, 2024, (available at), https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/CVOW-

C%20COP%20Approval%20Letter%20OCS-A%200483%20.pdf (Approving COP submitted by Dominion Energy).

[xiv] Press Release, Final Federal Approvals for Dominion Energy's Coastal Virginia Offshore Wind Represent Another Major Milestone Towards Successful Project Completion, DOMINION ENERGY (Jan 30, 2024), https://news.dominionenergy.com/2024-01-30-Final-Federal-Approvals-for-Dominion-Energys-Coastal-Virginia-Offshore-Wind-Represent-Another-Major-Milestone-Towards-Successful-Project-Completion.

[xv] Adnan Memija, *Orion Loads First Coastal Virginia Foundations, Work on Project's Second Offshore Substation Begins,* OFFSHOREWIND.BIZ (May 13, 2024), https://www.offshorewind.biz/2024/05/13/orion-loads-first-coastal-virginia-foundations-work-on-projects-second-offshore-substation-begins/#:~:text=The%20first%20six%20foundations%20for,production%20site%20in%20Aalborg%2C%20Denmark.

[xvi] Record of Decision, Empire Offshore Wind: Empire Wind Project (EW 1 and EW2) Construction and Operations Plan, BUREAU OF OCEAN ENERGY MANAGEMENT (BOEM) BUREAU OF OCEAN ENERGY MANAGEMENT (BOEM) (Nov. 20, 2023), https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Empire-Wind-OCA-A-0512-ROD.pdf.

[xvii] Offshore Wind, Offshore Wind 2023 Solicitation (Closed), NYSERDA, https://www.nyserda.ny.gov/All-Programs/Offshore-Wind/Focus-Areas/Offshore-Wind-Solicitations/2023-Solicitation (last visited May 22, 2024).

[xviii] Press Release, BOEM Approves Construction and Operations Plan for Empire Wind's Offshore Wind Project, BUREAU OF OCEAN ENERGY MANAGEMENT (BOEM) (Feb. 22, 2024), https://www.boem.gov/newsroom/press-releases/boem-approves-construction-and-operations-plan-empire-winds-offshore-wind.

[xix] *Empire Offshore Wind: Empire Wind Project (EW 1 and EW 2) Construction and Operations Plan*, Vol. 1, EQUINOR (Nov. 2023), at 16-20, https://www.boem.gov/sites/default/files/documents/renewable-energy/Public_EOW_COP_v7_Volume%201_Project%20Information%20Redacted.pdf.

[xx] New York's Offshore Wind Projects, NYSERDA, https://www.nyserda.ny.gov/All-Programs/Offshore-Wind/Focus-Areas/NY-Offshore-Wind-Projects (last visited May 22, 2024).

[xxi] Renewable Energy, Sunrise Wind, BUREAU OF OCEAN ENERGY MANAGEMENT (BOEM), https://www.boem.gov/renewable-energy/state-activities/sunrise-wind (last visited May 22, 2024).

[xxii] Offshore Wind, Offshore Wind 2018 Solicitation, NYSERDA, https://www.nyserda.ny.gov/All-Programs/Offshore-Wind/Focus-Areas/Offshore-Wind-Solicitations/2018-Solicitation (last visited May 22, 2024).

[xxiii] Press Release, Biden-Harris Administration Approves Seventh Offshore Wind Project, U.S. DEPARTMENT OF THE INTERIOR (Mar. 26, 2024), https://www.doi.gov/pressreleases/biden-harris-administration-approves-seventh-offshore-wind-project.

[xxiv] Construction Updates, SUNRISE WIND, https://sunrisewindny.com/resources-and-faqs/construction-updates (last visited May 22, 2024).

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STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. E-100, SUB 190

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of 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.l(c)	))))))))	**DIRECT TESTIMONY OF JOSH KAPLOWITZ ON BEHALF OF ENVIRONMENTAL DEFENSE FUND**

EXHIBIT A

North Carolina Offshore Wind Capacity Assessment

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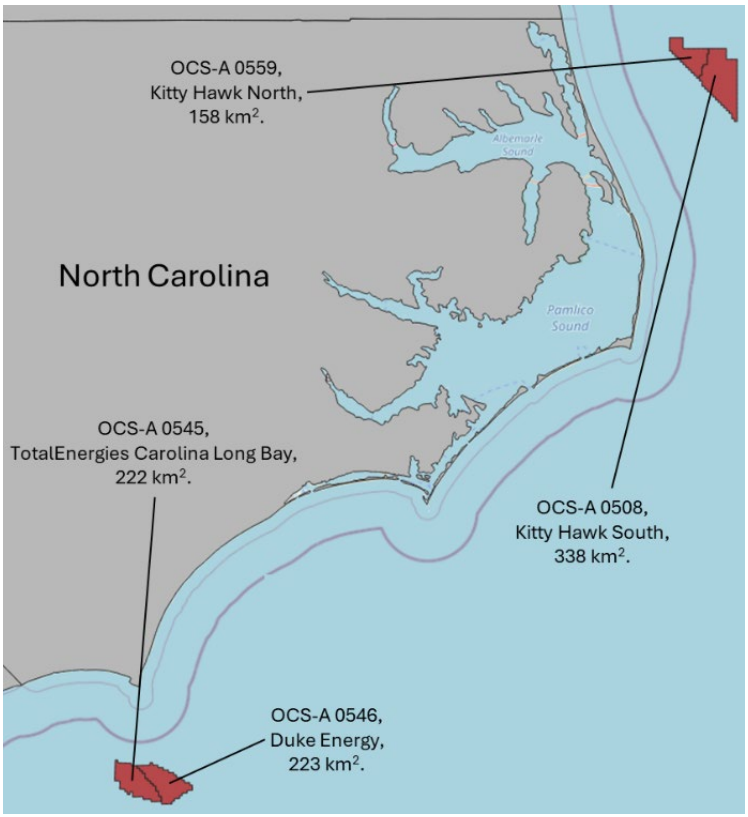
National Renewable Energy Laboratory

The National Renewable Energy Laboratory (NREL) has been commissioned by BOEM to assess the technical and economic challenges of developing offshore wind energy in the Central-Atlantic region to help the United States and the individual Central-Atlantic states achieve their respective electrification and decarbonization goals. The Central Atlantic region includes Delaware, Maryland, Virginia (VA), and North Carolina (NC). Each state has unique offshore wind attributes and electrification requirements. This is a brief summary of the potential offshore wind capacity for existing lease areas on the outer continental shelf adjacent to North Carolina.

NC has up to four viable lease areas for offshore wind development as of April 22nd, 2024:

OCS-A 0559 – Kitty Hawk North: Kitty Hawk North's current Construction and Operations Plan (COP) accommodates up to two export cables, with Sandbridge Beach (Virginia Beach, VA) being the preferred point of interconnection in the COP's Proposed Activity. However, a COP revision allowing for interconnection to North Carolina could be considered if a viable market pathway in NC emerges. The COP for Kitty Hawk North includes potential locations for up to 56 Wind Turbine Generators (WTGs) and one Electrical Service Platform (ESP).



OCS-A 0508 – Kitty Hawk South: The proposed project is positioned 27 miles east of Corolla, NC, adjacent to Kitty Hawk North, and is designed to incorporate up to 121 WTGs and up to 2 ESPs. The project includes the installation of up to four offshore export cables with potential landfall locations in Virginia Beach, VA, and/or locations in southern NC near Morehead City.

OCS-A 0545 – TotalEnergies Carolina Long Bay: A collaborative SAP was jointly submitted with Duke Energies Renewables Wind on November 15, 2023, and is undergoing review by BOEM. This project situated 22 miles off Bald Head Island, NC, encompasses an area of 222 km^2. According to the developer's projections, the anticipated project capacity is set at 1 to 1.2 GW, with the expected Commercial Operation Date (COD) targeted for 2030 or the early 2030s (TotalEnergies, TotalEnergies).

OCS-A 0546 – Duke Energy Renewables Wind: This project situated 22 miles off Bald Head Island, NC, encloses an area of 223 km^2. According to Duke Energy, the potential of this project could reach up to 1.6 GW, with an expected COD targeted to 2032.

If all the mentioned projects secure a point of interconnection and an offtake in NC, the state would unlock 941 km^2 of offshore wind development potential. Table 1 summarizes the minimum and maximum capacity potential of these lease areas in MW.

Table 1: Minimum and Maximum Project Capacities and Densities in Lease Areas with Potential Interconnection to NC.

Lease Area	Project Name	WTG positions from COP	Min.Capacity (MW)	Max.Capacity (MW)	Area (km^2)	Capacity Density Range (MW/km^2)
OCS-A 0559	Kitty Hawk North	Up to 56	750[a]	1,100[a]	158	4.75-6.96
OCS-A 0508	Kitty Hawk South	Up to 121	1,650[a]	2,400[a]	338	4.88-7.10
OCS-A 0545	TotalEnergies Carolina Long Bay	TBD	1,000	1,200	222	4.50-5.41
OCS-A 0546	Duke Energy Renewables Wind	TBD	1,000[b]	1,600	223	4.48-7.17
All combined	-	-	4,400	6,300	941	4.68-6.70

a) The maximum capacity for Kitty Hawk North is based on utilizing 55 out of the 56 available WTG positions, employing 20-MW WTGs. Conversely, the minimum capacity assumes the use of 50 out of 56 positions with 15-MW WTGs. For Kitty Hawk South, the maximum capacity considers utilizing 120 out of 121 available WTG positions with 20-MW WTGs, while the minimum capacity is based on using 110 out of 121 positions with 15-MW WTGs. These maximum estimates for both projects collectively amount to the 3.5 GW maximum potential estimated by Avangrid.

b) Assume min. capacity potential of 1,000 MW from the adjacent TotalEnergies lease area that has approximately the same size (TotalEnergies).

Based on the assumed capacities from Table 1, these four lease areas could deliver 4.4 to 6.3 GW of offshore wind capacity to North Carolina.

Conclusions:

1. Based on a 4.4 MW/km^2 capacity density (weighted-average capacity density from all U.S. projects as of December 2023[1]), the total potential capacity of these four lease areas with a possible interconnection to NC amounts to 4,140 MW.
2. Considering a 5.6 MW/km^2 capacity density (weighted-average capacity density from all U.S. projects excluding Massachusetts and Rhode Island projects as of December 2023[1]), the total potential capacity of these four lease areas with a possible interconnection to NC stands at 5,270 MW.
3. If all the mentioned projects secure a point of interconnection and an offtake in NC, reaching a total capacity of 6 GW would require a weighted average capacity density across the four leases (OCS-A 0559, OCS-A 0508, OCS-A 0545, and OCS-A 0546) equal to or exceeding 6.4 MW/km^2. While this capacity density would be on the high end of current U.S. project planned capacity densities, it remains within reasonable bounds[2]. Further analysis is encouraged to developers to assess the economic, energy production, and technical implications of such capacity densities, considering all relevant economic variables.

[1] In December 2023, Mulas Hernando et al. 2023 reported significant variability in planned capacity density among 17 U.S. offshore wind fixed-bottom projects, ranging from 2 to 9 MW/km^2. The weighted-average capacity density for these projects was 4.4 MW/km^2. If the projects that are limited to wide turbine spacing in Massachusetts and Rhode Island are excluded, the weighted average capacity increases to 5.6 MW/km^2.

[2] The third New Jersey solicitation in January 2024 (now cancelled by NYSERDA) has revealed higher capacity densities surpassing the weighted average. Leading Light Wind, Excelsior Wind, and Attentive Energy ONE and TWO would report densities of 7.06, 7.55, and 8.05 MW/km^2, respectively, according to their awarded offtakes. Empire Wind 1 and Empire Wind 2 planned capacity densities are 7.42 and 8.13 MW/km^2, respectively (Mulas Hernando et al. 2023).