

**STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH**

DOCKET NO. E-100, SUB 179

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

Docket No. E-100, Sub 179)	
)	POST-HEARING BRIEF
In the Matter of:)	OF THE
Duke Energy Progress, LLC, and)	NORTH CAROLINA
Duke Energy Carolinas, LLC, 2022)	ATTORNEY GENERAL'S OFFICE
Biennial Integrated Resources Plans)	
and Carbon Plan)	

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Oct 24 2022

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Pursuant to Commission Rule R1-25, the Commission's *Order Establishing Expert Witness Hearing Procedures* entered on August 30, 2022 in this docket, and Chair's instructions at the conclusion of the expert evidentiary hearing on September 29, 2022, (T30, p 127) the North Carolina Attorney General's Office (AGO) respectfully submits this post-hearing brief.

INTRODUCTION

On September 12, 1962, President John F. Kennedy declared that the nation planned to send a manned spacecraft to the moon by the end of the decade. Six decades later, on September 13, 2022, the Commission began an expert witness hearing to develop a plan to achieve 70% carbon reductions from our State's electric generating facilities by the end of this decade. In his speech, President Kennedy declared:

We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win[.]¹

House Bill 951, titled Energy Solutions for North Carolina, passed our General Assembly with bipartisan support and was signed by the Governor Cooper on October 13, 2021. Section 1 of House Bill 951, codified as N.C.G.S. § 62-110.9, established multiple carbon reduction targets for electric utilities through 2050. The remaining sections of House Bill 951 provided the electric utilities and the

¹ Address at Rice University on the Nation's Space Effort (September 12, 1962), <https://www.jfklibrary.org/learn/about-jfk/historic-speeches/address-at-rice-university-on-the-nations-space-effort#:~:text=to%20the%20moon.-,We%20choose%20to%20go%20to%20the%20moon%20in%20this%20decade,to%20postpone%2C%20and%20one%20which.>

Commission with tools for achieving those targets, including allowing electric utilities methods for speedier cost recovery and performance-based incentives. At least one electric utility has already availed themselves of these new provisions.² Whether recognizing the threat that climate change poses to our State or the opportunity afforded by the energy transition that is occurring around the world, House Bill 951 ordered the Commission to take *all* reasonable steps to achieve a 70% reduction of emissions of carbon dioxide from electric generating facilities from certain electric public utilities by the year 2030 from 2005 levels and to achieve carbon neutrality by the year 2050. The General Assembly recognized that transforming our electricity system was a challenge that we—as a state—are willing to accept and unwilling to postpone.

The task before the Commission is much simpler than going to the moon. The technologies necessary to accomplish the Commission's task already exist and North Carolina's energy transition is part of a broad, global effort to decarbonize. However, the task will require everyone to act quickly and decisively, work collaboratively, and creatively examine traditional ways of thinking. Or, as President Kennedy urged, "we must be bold."³

This call to be bold was echoed by the outpouring of public comments received in this docket. Over 200 written comments were received and over 130 witnesses testified at public hearings. These comments overwhelmingly supported this Commission taking bold, decisive action to implement N.C.G.S. § 110.9:

² Application of Duke Energy Progress, LLC for Adjustment of Rates and Charges Applicable to Electric Service in North Carolina and Performance Based Regulation, Docket No. E-2, Sub 1300 (Oct. 6, 2022).

³ Id.

- “We ask that the Commission support our efforts to improve the economic well-being of North Carolinians and transition the state to a clean energy economy, by finalizing a Carbon Plan with a demonstrable commitment to providing access to clean energy, meeting the state's 2030 carbon reduction requirements, and providing regulatory certainty in this market.”⁴
- “[A] Carbon Plan that allows Duke to push the compliance date by multiple years would seriously reduce the likelihood of local governments meeting their climate targets, many of which include milestones similar to the state’s 70% reduction by 2030 goal. . . . [I]n addition to increased emissions in the near term, delays in implementation result in increased costs for both local governments and utilities due to inflation and other factors.”⁵
- “Had the world been pushing forward with the clean energy transition over the last two decades, we would be in such a better position We need to finally seize the opportunity. I am quite certain we have enough intelligent people who would be very willing to work on the associated challenges.”⁶
- “[The Commission] must take responsibility for a plan that ensures fast, effective action for a better future. Duke Energy's current plan does not meet the urgency of the moment we’re in.”⁷
- “I urge the Commission to consider that in the long-term there are costs for failing to act or for delaying action on reducing carbon emissions. Those costs fall on all of us[.]”⁸
- “North Carolina has recognized the urgency of emphatical climate change in passing HB951. Duke Energy apparently has not. Instead of bold carbon reduction plans they present poor weak paths, three of which do not even comply with the law, and they ask that the Utilities Commission adopt the Plan and approve them all to give them flexibility.” (Testimony of Maria Portoue, T5, pp 117-19)
- “We are all striving to play our part, and this is your part to play, your particular part to play, so we need you to act boldly.” (Testimony of Farah Ogletree, T4, p 93)
- “This is a time to be bold.” (Testimony of Gary Nelson, T1, p 129)

⁴ Comments of the North Carolina Dept. of Comm., Docket No. E-100, Sub 179CS (Sept. 9, 2022).

⁵ Comments of North Carolina Local Governments, Docket no. E-100, Sub 179CS (Aug. 23, 2022).

⁶ Comments of Michele Belanger, Docket No. E-100, Sub 179CS (Aug. 3, 2022).

⁷ Comments of Vickie Atkinson, Docket No. E-100, Sub 179CS (July 14, 2022).

⁸ Comments of Marian Swinker, Docket No. E-100, Sub 179CS (Oct. 10, 2022).

This post-hearing brief presents the Commission with a path to achieving N.C.G.S. § 62-110.9's statutory requirements. Section I discusses the statutory obligation to develop a plan that achieves the 2030 carbon reduction target. Section II discusses the legality of including third-party purchases as a resource option in the Commission's Carbon Plan. Section III lays out the various paths that the Commission has been presented in order to accomplish its statutory obligations. Section IV discusses the SP-AGO portfolio, which is the most reasonable path, and the steps the Commission must take prior to the 2024 Carbon Plan proceeding in order to implement it. Section V details why Duke's proposed Carbon Plan does not present a reasonable path to accomplishing N.C.G.S. § 62-110.9's statutory requirements. Section VI discusses why the supplemental portfolios SP5 and SP6 are inadequate. Section VII discusses a number of modeling flaws that Duke must be directed to remedy prior to its next Carbon Plan filing. Finally, the remaining sections address a variety of legal questions facing the Commission.

PROCEDURAL BACKGROUND

Following the passage of House Bill 951, the Commission issued an *Order Requiring Filing of Carbon Plan and Establishing Procedural Deadlines* on November 19, 2021, which initiated this docket. In that order, Duke Energy Carolinas, LLC (DEC) and Duke Energy Progress, LLC (DEP) (together, Duke) were directed to hold at least three meetings to receive input from stakeholders prior to March 31, 2022, to file reports identifying points of consensus, and thereafter to file a proposed Carbon Plan "that is consistent with the requirements

of Section 1 of” House Bill 951 on or before April 1, 2022.⁹ Other parties were directed to file responsive comments and alternative plans within 60 days.¹⁰

On November 23, 2021, Duke filed a motion to extend time to file its proposed Carbon Plan by 45 days, until May 16, 2022 in order to “receive material input regarding modeling inputs and assumptions through the stakeholder process.” The Commission granted Duke’s request in its November 29, 2021 *Order Granting Extension of Time* and also extended the deadline for intervenors to file comments to July 15, 2022.

The AGO gave notice of its intent to intervene pursuant to N.C. Gen. Stat. §§ 62-20 and 114-2(8) on January 27, 2022.

Duke held stakeholder meetings on January 25, 2022, February 25, 2022, and March 22, 2022. In addition, Duke held three technical subgroup meetings on February 18, 2022.

On March 9, 2022, the Commission entered an *Order Scheduling Public Hearings and Requiring Public Notice* scheduling four in-person public witness hearings as well as a fifth public witness hearing to be held remotely. The public hearings were conducted in Durham County on July 11, 2022, in New Hanover County on July 12, 2022, in Buncombe County on July 27, 2022, in Mecklenburg County on July 28, 2022, and remotely via WebEx on August 23, 2022.

On April 1, 2022, the Commission entered an *Order Establishing Additional Procedures and Requiring Issues Report*. The Commission held that due to “the

⁹ Order Requiring Filing of Carbon Plan and Establishing Procedural Deadlines issued in this docket on November 19, 2021 and Order Granting Extension of Time issued on November 29, 2021.

¹⁰ Id.

expedited nature of this proceeding,” the Commission would attempt to resolve all issues arising in this docket based on the written record. The Commission therefore directed the parties to confer prior to July 15, 2022 in order to narrow the issues in controversy that would require an expert witness hearing. The order required Duke to file a list of issues in dispute by July 22, 2022.

On May 16, 2022, Duke filed its proposed Carbon Plan.

On June 2, 2022, Duke filed a motion to modify the issues report requirement, requesting the opportunity to file written responsive comments on any issues that do not require an evidentiary hearing. The Commission granted Duke’s request in a June 15, 2022 procedural order and outlined a bifurcated proceeding.

Intervenors filed their initial comments on July 15, 2022. Following the filing of initial comments, Duke filed its report of factual issues in contention and legal issues for briefing. In its July 29, 2022 *Order Scheduling Expert Witness Hearing, Requiring Filing of Testimony, and Establishing Discovery Guidelines*, the Commission scheduled expert witness hearings and ordered parties to pre-file expert testimony pursuant to the follow scheduling: Duke direct testimony on August 19, 2022; Intervenor direct testimony on September 2, 2022; and Duke rebuttal testimony on September 9, 2022. The Commission also allowed parties to file responsive comments on specific, designated legal issues by September 9, 2022.

Evidentiary hearings regarding expert testimony began on September 13 and continued through September 29, 2022. At the conclusion of the hearing, the

Chair stated that parties may file proposed orders and post-hearing briefs by October 24, 2022.

ARGUMENT

I. THE COMMISSION MUST DEVELOP A PLAN FOR ACHIEVING HOUSE BILL 951'S 2030 CARBON REDUCTION TARGET.

The plain language of N.C.G.S. § 62-110.9 states a clear requirement that the Commission must develop a plan for reducing the carbon dioxide emissions attributable to electric generating facilities in the State by 70% by the year 2030.

The title of the act emphasized this point:

AN ACT TO AUTHORIZE THE UTILITIES COMMISSION TO . . . TAKE ALL REASONABLE STEPS TO ACHIEVE A SEVENTY PERCENT REDUCTION IN EMISSIONS OF CARBON DIOXIDE FROM ELECTRIC PUBLIC UTILITIES FROM 2005 LEVELS BY THE YEAR 2030 AND CARBON NEUTRALITY BY THE YEAR 2050.¹¹

N.C.G.S. § 62-110.9 provides:

The Utilities Commission shall take all reasonable steps to achieve a seventy percent (70%) reduction in emissions of carbon dioxide (CO₂) emitted in the State from electric generating facilities owned or operated by electric public utilities from 2005 levels by the year 2030 and carbon neutrality by the year 2050.

N.C.G.S. § 62-110.9(2) and (3) further require that the Commission's Carbon Plan "comply with current law and practice with respect to the least cost planning for generation . . . in achieving the authorized carbon reduction goals and determining generation and resource mix for the future" and also "maintain or improve upon the adequacy and reliability of the existing grid." As described below in Section III, multiple parties, including Duke, have presented the Commission with portfolios

¹¹ Smith Chapel Baptist Church v. City of Durham, 350 N.C. 805, 812, 517 S.E.2d 874, 879 (1999) ("[T]he title of an act should be considered in ascertaining the intent of the legislature.").

that are designed to achieve these requirements. The Commission must develop a plan that does so.

N.C.G.S. § 62-110.9(4) provides the Commission with discretion to “determine optimal timing and generation and resource-mix to achieve the least cost path to compliance with the authorized carbon reduction goals[.]” This discretion is not, however, unlimited. Instead, N.C.G.S. § 62-110.9(4) holds that the Commission retains discretion:

[T]o determine optimal timing and generation and resource-mix to achieve the least cost path to compliance with the authorized carbon reduction goals, including discretion in achieving the authorized carbon reduction goals by the dates specified in order to allow for implementation of solutions that would have a more significant and material impact on carbon reduction; provided, however, the Commission shall not exceed the dates specified to achieve the authorized carbon reduction goals by more than two years, except in the event the Commission authorizes construction of a nuclear facility or 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.

This provision provides three circumstances where the Commission may exercise the discretion to delay “achieving the authorized carbon reduction goals[.]” First, the Commission may delay compliance by up to two years “in order to allow for implementation of solutions that would have a more significant and material impact on carbon reduction.” Second, the Commission may delay compliance by more than two years if “the Commission authorizes construction of a nuclear facility or wind energy facility” and additional time is necessary to complete that facility “due to technical, legal, logistical, or other factors beyond the control of the electric public utility[.]” Third, the Commission may delay compliance

by more than two years “in the event necessary to maintain the adequacy and reliability of the existing grid.”

- A. The Commission may delay compliance with the 70% carbon reduction target by up to two years in order to allow for implementation of solutions that would have a more significant and material impact on carbon reduction.

The first circumstance described in N.C.G.S. § 62-110.9(4) authorizes the Commission to delay achieving the 70% carbon reduction target up to two years beyond 2030 “to allow for implementation of solutions that would have a more significant and material impact on carbon reduction.” Duke has not shown that the delays proposed in Portfolios 2, 3, or 4 would allow solutions that are more impactful on carbon reduction. In fact, Duke’s Carbon Plan shows that the opposite is true: the delays in those portfolios actually lead to a *less* significant impact. Portfolio 1—the only portfolios that meets the 2030 target—provides the most annual carbon reductions in nearly all years prior to 2050 and the most cumulative carbon emissions by 2050.¹² Because Duke has not shown that Portfolios 2, 3, or 4 would result in a “more significant and material impact on carbon reduction,” it is not appropriate for the Commission to rely on those portfolios in its final Carbon Plan.

Duke disagrees, and argues that the Commission has “broad authority” to extend the timeline for achievement of the 70% carbon reduction target, contending that “the Commission’s discretion to allow for an extension of the Interim Target Achievement Date beyond [2030] to 2032 is broad—the

¹² Duke Carbon Plan, Appendix E, Figure E-15 and Table E-74. See also Figure E-16 and Table E-88 for the Alternative Fuel Supply Scenario,

Commission “[r]etains discretion to determine optimal timing and generation and resource-mix to achieve the least cost path.”¹³ However, Duke’s reference to N.C.G.S. § 62-110.9(4) cuts the quote short in a way that is misleading. The full clause provides the Commission the discretion “to determine optimal timing and generation and resource mix to achieve the least cost path to compliance with the authorized carbon reduction goals.” Further, this provision must be read together with the provision earlier in the statute that requires the Commission to “take all reasonable steps” to achieve the emission reductions by the dates specified in the statute. Under this reading, the Commission has the discretion to make determinations about when and which resources should be added in order to reach the carbon reduction targets by the dates specified in the statute.

Duke also points to the word “including” in N.C.G.S. § 62-110.9(4) to contend that delay in order to achieve a “more significant and material impact on carbon reduction” is simply an “illustrative example” of ways that the Commission may exercise its discretion.¹⁴ In order to support that reading, Duke cites Adams v. Dole, 927 F.2d 771, 777 (4th Cir. 1991). However, as is noted in Adams, in some instances “the term ‘including’ can also introduce restrictive or definitional terms,” such that “the word ‘including’ means ‘and’ or ‘in addition to.’” The Court explained that this definition applies when there is an inconsistency between the general phrase and the specific example.¹⁵ Here, there is clearly an inconsistency between “achiev[ing] the least cost path to compliance with the authorized carbon reduction

¹³ Responsive Comments of Duke at 8.

¹⁴ Responsive Comments of Duke at 8 (citing Adams v. Dole, 927 F.2d 771, 776–77 (4th Cir. 1991)).

¹⁵ Adams v. Dole, 927 F.2d 771, 777 (4th Cir. 1991).

goals” and not achieving those goals. Therefore, the phrase should be read to mean that the Commission has the discretion “[t]o determine optimal timing and generation and resource-mix to achieve the least cost path to compliance with the authorized carbon reduction goals [and] discretion in achieving the authorized carbon reduction goals by the dates specified in order to allow for implementation of solutions that would have a more significant and material impact on carbon reduction.”

Some parties argue that “Section 110.9 provides for a balancing between the 2030 interim compliance timeline, least-cost planning, and adequacy and reliability,”¹⁶ such that compliance can be delayed to lessen costs, but this reading does not comport with the plain language of the statute. N.C.G.S. § 62-110.9(4) requires selection of the least cost path “to compliance with the authorized carbon reductions goals.” The statute does not permit sacrificing or “balancing” achievement of the authorized carbon reductions goals in order to lower costs any more than N.C.G.S. 62-110.9(3) permits sacrificing reliability to lower costs when it requires that the Commission’s Carbon Plan “maintain or improve upon the adequacy and reliability of the existing grid.” As the Public Staff noted, least cost planning has long been an overarching policy of N.C.G.S. § 62, but the Commission has never held that “least cost” principles allow it to ignore specific statutory mandates. If the General Assembly believed that the 70% reduction target could be delayed based on cost alone, then it simply would have set the compliance year as 2032. Otherwise, it is unnecessary to require the Commission

¹⁶ Responsive Comments of the Public Staff at 6.

to achieve the “least cost path to compliance” while also allowing the Commission to delay compliance based on “least cost” principles. Duke acknowledges the unreasonableness of such revisions to the carbon reduction targets, stating:

Nor did the General Assembly establish specific carbon reduction goals only to have them discarded based on alleged least cost planning. Rather, the General Assembly directed that least cost principles be applied within the context of all of the requirements of HB 951 to select the appropriate mix of supply-side resources . . . and demand-side resources that will enable Duke Energy to achieve the targeted emissions reductions.¹⁷

The AGO agrees.

B. The Commission may delay compliance with the 70% carbon reduction target by more than two years under certain conditions that cannot be satisfied until a later date.

N.C.G.S. § 62-110.9(4) lays out two scenarios where the Commission has the discretion to exceed the clear statutory deadlines by more than two years: (1) if necessary to allow the “additional time for completion [of a wind or nuclear facility] due to technical, legal, logistical, or other factors beyond the control of the electric public utility” and (2) “in the event necessary to maintain the adequacy and reliability of the existing grid.” At this time: (1) the Commission has not “authorize[d] construction of a nuclear facility or wind energy facility” much less one that “would require additional time for completion due to technical, legal, logistical, or other factors beyond the control of the electric public utility;” and (2) exceeding the statutory deadline is not “necessary to maintain the adequacy and reliability of the existing grid.”

¹⁷ Responsive Comments of Duke at 29. These comments were made in Duke’s discussion of N.C.G.S. § 62-110.9’s ownership requirements, but are not apt in that context and are more appropriately applicable to the goals for reducing carbon by 2030 and for achieving net zero carbon by 2050.

- i. A delay by more than two years is not necessary at this time to allow for the completion of a wind or nuclear facility due to factors beyond the control of Duke.

The plain meaning of N.C.G.S. § 62-110.9(4) shows that the Commission may exceed the statutory deadline by more than two years only if factors beyond the control of the public utility necessitate additional time for completion of a previously authorized wind or nuclear facility.¹⁸ The provision offers a safety valve for delay of the compliance date by more than two years to address factors beyond the utility's control if construction of a nuclear or wind facility is authorized. Duke has acknowledged that “the Commission’s ultimate determination of whether to ‘select’ the addition of new nuclear or wind facilities and authorize their construction, thereby allowing an extension of the Interim Target Achievement Date beyond 2032 will occur in a later proceeding.”¹⁹ Therefore, the Commission cannot exercise this discretion at this time.

Duke next argues that “the Commission can meet its planning responsibilities under House Bill 951 by selecting specific near-term actions and accepting as reasonable for planning purposes a range of intermediate- and longer-term portfolios, some of which would require the Commission to exercise its discretion” to delay beyond 2032.²⁰ However, this argument ignores a key portion of the Commission’s discretion. Under N.C.G.S. § 62-110.9(4), once construction of a nuclear or wind facility is authorized, the Commission may only

¹⁸ The plain meaning of a statute controls as long as the statute is clear and unambiguous. State v. Jackson, 353 N.C. 495, 501, 546 S.E.2d 570, 574 (2001).

¹⁹ Responsive Comments of Duke at 11.

²⁰ Responsive Comments of Duke at 12.

exceed the compliance deadlines if—and only if—a “technical, legal, logistical, or other factors beyond the control of the electric public utility” causes a delay.

The phrase “technical, legal, logistical, or other factors beyond the control of the electric public utility” only allows delay in a narrow range of circumstances beyond the utility’s control. In Gift Surplus, LLC v. State ex rel. Cooper, 380 N.C. 1, 868 S.E.2d 20 (2022), the North Carolina Supreme Court analyzed N.C.G.S. § 14-306.4, which prohibits the operation of electronic sweepstakes. The statute lists a number of prohibited games, including “[a] video bingo game,” “a video lotto game,” and a catch-all provision prohibiting “any other video game not dependent on skill or dexterity.” Applying the canon of statutory interpretation *ejusdem generis*,²¹ the Court held that “the logical implication of this provision is that the other games listed are also games ‘not dependent on skill or dexterity[.]’” *Id.* at 10, 868 S.E.2d at 26. Applying this same logic shows that the Commission does not have the discretion to delay for any “technical, legal, logistical” reason, but only those “beyond the control of the electric public utility.” Duke argues that such a reading would “force an absurd result, requiring the Companies to turn a blind eye to the realistic development timeline for resources like small modular reactors (SMRs) that require further development.”²² But, N.C.G.S. § 62-110.9 does not indicate that SMRs must be included in the plan developed to achieve 70% carbon reduction. There is nothing absurd about the General Assembly requiring the plan to select from technologies that can be reasonably expected to meet the 2030 carbon reduction target.

²¹ A Latin phrase meaning “of the same kind.”

²² Responsive Comments of Duke at 14.

Contrary to Duke's reading, the provision was not meant to give the Commission unlimited discretion to delay—for an indeterminate amount of time—as long as a wind or nuclear facility is included in a Carbon Plan. In interpreting N.C.G.S. § 62-110.9(4), the Commission must “give every word of the statute effect, presuming that the legislature carefully chose each word used.” N.C. Dept. of Corrections v. N.C. Med. Bd., 363 N.C. 189, 201, 675 S.E.2d 641, 649 (2009). Duke's erroneous reading would render much of the statutory language superfluous, i.e., it would have revised the provision to read: “The Commission has the discretion to exceed the clear statutory deadlines by more than two years if necessary to allow the additional time for completion of an authorized wind or nuclear facility ~~due to technical, legal, logistical, or other factors beyond the control of the electric public utility.~~” As Duke has recognized in other contexts, the Commission has “no power to add to or subtract from the language of the statute . . . The question of the wisdom or propriety of statutory provisions is not a matter for the courts, but solely for the legislative branch of the state government.”²³

Certainly, nothing in N.C.G.S. § 62-110.9(4) prohibits the Commission from developing contingency plans in the event elements of its initial Carbon Plan fail to materialize as anticipated. But it does not allow the Commission to pursue a plan from the outset that does not aim to achieve the carbon reduction targets. The biennial nature of the Carbon Plan supports the notion that the initial Carbon Plan is meant to evolve based on real-world developments. The Public Staff seems to support this approach, stating “meeting the interim compliance goal of 2030 is a

²³ Responsive Comments of Duke at 20 (citing Ferguson v. Riddle, 233 N.C. 54, 57, 62 S.E.2d 525, 528 (1950)).

priority, and the Public Staff is not recommending that the Commission preemptively authorize a delay in meeting the interim compliance goals[.]”²⁴ However, the logical outgrowth is that if the Commission cannot explicitly preemptively authorize a delay, the Commission also cannot constructively preemptively authorize a delay by declining to take steps that are necessary to meet the carbon reduction targets. As discussed below, Duke and the Public Staff’s proposed near-term actions operate as constructive preemptive delays, which are outside of the Commission’s discretion to authorize.

- ii. A delay by more than two years is not necessary at this time in order to maintain the adequacy and reliability of the existing grid.

The other circumstance in which the Commission has discretion to delay the compliance deadline by more than two years is “in the event necessary to maintain the adequacy and reliability of the existing grid.” This provision was also meant to allow a “safety valve” in the event a delay of more than two years becomes necessary. For example, this provision would allow the Commission to authorize the delay of a scheduled retirement of a generating facility if necessary to maintain reliability. However, it is not reasonable to delay the 2030 compliance date in the initial plan developed by the Commission based on this provision.

Furthermore, such a delay has been shown to be unnecessary. Duke’s own metrics for measuring reliability show that Duke’s proposed Portfolios 3 and 4 are not more reliable than Portfolio 1. (See Duke Carbon Plan, Appendix E, Table E-58, T7, p 33). In fact, Portfolio 1 meets the 2030 target and also has the lowest

²⁴ Responsive Comments of the Public Staff at 5.

chance of an outage, i.e., it is the most reliable, under each of the metrics used to calculate the probability of an outage or unserved energy.

The Commission is required to develop a Carbon Plan to “achieve the least cost path to compliance with the authorized carbon reduction goals,” and to “take all reasonable steps to achieve a seventy percent (70%) reduction . . . by the year 2030.” The carbon reduction goals include not only the carbon reduction amounts, but the timing of those reductions as well.

In passing House Bill 951, the General Assembly—representing the will of the people of North Carolina—recognized that the cost of failing to address climate change was far higher than the cost of taking action.²⁵ It is not the role of this Commission to second guess that decision, but to faithfully implement those statutory mandates.²⁶ Other parties have argued that by referring to the authorized carbon reductions as “goals,” the General Assembly has given the Commission discretion to write them off as aspirational.²⁷ This interpretation runs counter to how legislative authority in our state has been delegated to administrative bodies,

²⁵ See e.g. Van Houtven, et al., *Climate Change and North Carolina: Near-term Impacts on Society and Recommended Actions*, RTI International (Oct. 2020), https://coastalreview.org/wp-content/uploads/2020/12/NC_Costs_of_Inaction.pdf; Kunkel, et al., *North Carolina Climate Science Report*, North Carolina Institute for Climate Studies (Sept. 2020), <https://ncics.org/nccsr>; Megan Fencil, *The High Cost of Climate Change in North Carolina*, Sustain Charlotte (July 10, 2019), https://www.sustaincharlotte.org/the_high_costs_of_climate_change_in_north_carolina (quoting NC Board of Transportation's Vice-Chair Nina Szlosberg-Landis who stated that the NC Department of Transportation's costs for storm cleanup have increased by over \$150 million per year as a result of climate change).

²⁶ See *Lee v. Gore*, 365 N.C. 227, 229, 717 S.E.2d 356, 358 (2011) (“When, as here, statutory construction is at issue we must ascertain the intent of the legislating body and adhere to that intent. The language of the act, the spirit of the act and what the act seeks to accomplish are the greatest indicia of intent.”). See also *Hutton v. Webb*, 126 N.C. 897, 907, 36 S.E. 341, 344 (1900) (“[T]here [is no] indication that the wisdom of the courts is so far superior to the will of the people, expressed through the lawmaking body, that the judiciary shall virtue officii supervise and correct legislation, whether wise or unwise (in its estimation), when such legislation is enacted within the limits not forbidden to the general assembly by the constitution.”).

²⁷ See Responsive Comments of CIGFUR at 6 (“HB 951 clearly treats the 2030 interim compliance target as an aspirational goal, not a mandate.”).

such as the Commission. When assessing a grant of legislative authority, reviewing courts “insure that the decision-making by the agency is not arbitrary and unreasoned and that the agency is not asked to make important policy choices which might just as easily be made by the elected representatives in the legislature.”²⁸ In determining the scope of agency discretion, courts consider “declarations by the General Assembly of the legislative goals and policies which an agency is to apply when exercising its delegated powers.”²⁹ Under this formulation “goals” are not “aspirational” aims that may be ignored, but the guiding standards towards which the administrative body must focus its delegated authority to achieve.³⁰ By claiming that the word “goal” or “least cost” principles allow the Commission to disregard the statutory mandates, parties are attempting to rewrite policies set by the General Assembly. The Commission’s obligation is not to decide whether achieving 70% carbon reductions by 2030 is a worthwhile pursuit, but to develop a plan to achieve it.

II. Purchased power should be included as a selectable resource option.

Duke argues that “purchased power” is not a resource option that may be selected in the Carbon Plan except as expressly required for new solar

²⁸ Adams, 295 N.C. at 697–98, 249 S.E.2d at 411 (quoting Peter G. Glenn, *The Coastal Management Act in the Courts: A Preliminary Analysis*, 53 N.C. L.Rev. 303, 315 (1974)).

²⁹ Id. at 698, 249 S.E.2d at 411.

³⁰ Town of Spruce Pine v. Avery Cnty., 346 N.C. 787, 792, 488 S.E.2d 144, 147 (1997) (“the primary sources of guiding standards are declarations by the General Assembly of the legislative goals and policies that an agency is to apply when exercising its delegated powers.”) See also Adams v. N.C. Dept. of Nat. and Economic Resources, 295 N.C. 683, 698, 249 S.E.2d 402, 411 (1978) (“When there is an obvious need for expertise in the achievement of legislative goals the General Assembly is not required to lay down a detailed agenda covering every conceivable problem which might arise in the implementation of the legislation. It is enough if general policies and standards have been articulated which are sufficient to provide direction to an administrative body possessing the expertise to adapt the legislative goals to varying circumstances.”).

generation.³¹ However, Duke's narrow interpretation of the ownership requirement is not required or consistent with least cost resource planning and is contrary to the interest of North Carolina consumers.

Duke's argument rests on N.C.G.S. § 62-110.9(2), which requires that "[a]ny new generation facilities or other resources selected by the Commission in order to achieve the authorized reduction targets for electric utilities shall be owned and recovered on a cost of service basis by the applicable electric utility" except as noted for solar generation and energy efficiency measures or demand-side management. The statute should not be interpreted in a way that narrows the least cost alternatives for meeting the carbon reduction targets, and should be read to allow selection of purchased power in the Carbon Plan for the reasons described in this section.

First, the provision requires the applicable utility to own any generation facilities *or other resources*. Including rather than excluding purchased power as a potential "resource" that may be selected for the Carbon Plan is consistent with N.C.G.S. § 62-110.1(d), which requires that alternative resources must be evaluated when an application is filed for the construction of a generating facility. Under § 62-110.1(d), the Commission is required to "take into account" "the applicant's arrangements with other electric utilities for interchange of power, pooling of plant, *purchase of power* and other methods for providing reliable, efficient, and economical electric service." (Emphasis added.) Duke argues that House Bill 951 abandons the requirement to consider purchased power in the

³¹ Duke Pre-hearing Comments on Non-Expert Hearing Track Legal and Policy Issues at 19.

context of the Carbon Plan,³² but that interpretation is not expressly required, and House Bill 951 does not modify the certificate requirement in N.C.G.S. § 62-110.1(d). “Interpretations that would create a conflict between two or more statutes are to be avoided, and ‘statutes should be reconciled with each other . . .’ whenever possible.”³³

Second, the requirement that resources be “*owned*” by the applicable utility does not exclude purchased power as a selectable resource. “Ownership” is a legal status that means the owner has “the legal right to use, possess, and give away a thing.”³⁴ In this case, where the applicable utility acquires power by purchasing the energy and/or capacity, it then has legal ownership and the right to resell it. Ownership is not limited to tangible assets. Rather, ownership “can be tangible such as personal property and land, or it can be of intangible things....”³⁵

Third, the requirement that the cost of new resources be recovered on a “*cost of service*” basis does not eliminate purchased power as a selectable resource. Chapter 62 applies “cost of service” ratemaking to determine the rates charged retail customers in North Carolina, and allows the electric utility to recover the cost of purchased power in rates with annual adjustments.³⁶ Under the Competitive Procurement provision in § 62-110.8, an electric utility could calculate its authorized revenue “on a market basis in lieu of cost-of-service based recovery” for renewable energy facilities owned by the electric utility “using data from the

³² Duke Pre-hearing Comments on Non-Expert Hearing Track Legal and Policy Issues at 29-30.

³³ Hunt v. Reinsurance Facility, 302 N.C. 274, 288, 275 S.E.2d 399, 405 (1981).

³⁴ See

<https://www.law.cornell.edu/wex/ownership#:~:text=Ownership%20is%20the%20legal%20right,such%20as%20intellectual%20property%20rights>.

³⁵ Id.

³⁶ See N.C.G.S. §§ 62-133.2(a1), 62-133.8 (h), and 62-110.8 (g).

applicable competitive procurement to determine market price” if that approach was found to be in the public interest.³⁷ However, that market price approach is not available to the electric utility for resources selected for the Carbon Plan given the requirement in N.C.G.S. § 62-110.9(2) that costs must be recovered on a cost of service basis.³⁸

Fourth, a conclusion that purchased power cannot be a selectable resource in the Carbon Plan does not adequately consider Duke’s current reliance on purchased power as a resource.³⁹ It is important to note that Duke agrees that non-firm purchases of power are allowed under N.C.G.S. § 62-110.9(2).⁴⁰ Indeed, a substantial amount of non-firm power purchases are included in Duke’s proposed Carbon Plan,⁴¹ and power exchanges made pursuant to the Joint Dispatch Agreement between DEC and DEP occur as the dispatch draws from the resources of the “applicable utilities” *jointly* not separately. This wholesale power exchange arrangement is built into the modeling Duke performed in EnCompass to optimize the dispatch for the two electric utilities.⁴² It would not serve customers to eliminate joint dispatch from consideration in modeling, and similarly, it does not serve customers to limit other power purchases or exchanges as resources that may be selected in the Carbon Plan.

Fifth, excluding or limiting power purchases makes it more difficult to maintain reliable service. Shrinking the overall pool of resources available to Duke

³⁷ N.C.G.S. § 62-110.8(g).

³⁸ N.C.G.S. § 62-110.9(2).

³⁹ See Appendix E at 23.

⁴⁰ Duke Pre-hearing Comments on Non-Expert Hearing Track Legal and Policy Issues at 30-31.

⁴¹ Appendix E at 23.

⁴² See Appendix E to Duke’s Proposed Carbon Plan at 81.

makes it more challenging for Duke to meet reliability needs and to coordinate operations on the regional grid. Allowing power purchases expands the number of options available to Duke for meeting its reliability needs and also helps to facilitate more regional coordination, which will be increasingly necessary going forward to meet the Carbon Plan's targets.

Sixth, including purchased power as a selectable resource is consistent with least cost principles, and a least cost path to the Carbon Plan is emphasized in N.C.G.S. § 62-110.9.⁴³ Historic planning practices have long recognized the prudence of using third-party energy purchases.⁴⁴ Purchases from solar and solar plus storage providers were selected by EnCompass as optimal least cost resources to the full extent that those options were not constrained by Duke's assumptions and adjustments. (T21, p 314; T8, pp 74-75) Likewise, imported onshore wind was selected by EnCompass modeling where it was not limited to Duke generating facilities transmitted under firm transmission arrangements with PJM. (T25 p 282) However, as discussed in Sections IV, V, and VII, Duke took several steps to minimize the amount of such resources selected by the EnCompass modeling, including implementing a cumulative limit and using Firm Point-to-Point transmission costs. (T25, p 254-55)

Seventh, reading N.C.G.S. § 62-110.9 to include purchased power as a selectable resource is consistent with the federal framework under the Public Utility Regulatory Policies Act that requires electric utilities to purchase power from qualifying facilities. See 16 U.S.C. § 824a-3.

⁴³ N.C.G.S. § 62-110.9(1), (2), (4).

⁴⁴ See Commission Rule R8-60(d), (e), (i)(4).

Finally, excluding purchased power imposes increased costs on ratepayers. Not only are higher cost resources selected as a result, but—building on its argument that purchased power cannot be selected—Duke requests unreasonable assurances that its early costs to develop long-term resources will be recoverable from ratepayers regardless of whether the resources are ultimately found to be needed and even if the resources are never constructed.⁴⁵ If that relief is not granted, Duke suggests that efforts to meet carbon reduction targets will be “sabotaged” because it will cause delays in the development work. (T 22 p 321-23, 332-33)

Duke even takes this position about the development of a proposed offshore wind project owned by a Duke affiliate, although two other developers have invested in projects off the North Carolina coast without such assurance that ratepayers will ultimately pay the development costs. (T 22 p 332-337)

A less narrow reading of whether purchased power is a selectable resource for the Carbon Plan would alleviate the risks for ratepayers imposed by Duke’s demands for cost recovery assurances for such project development costs. For all of these reasons, the Commission should conclude that N.C.G.S. § 62-110.9(2) does not prohibit purchased power as a selectable resource for purposes of developing the Carbon Plan.

⁴⁵ Duke Pre-hearing Comments on Non-Expert Hearing Track Legal and Policy Issues at 36-37.

III. THE COMMISSION HAS BEEN PRESENTED WITH A VARIETY OF PORTFOLIOS THAT ACHIEVE N.C.G.S. § 62-110.9'S STATUTORY MANDATE.

The Commission must develop a Carbon Plan that achieves the 70% carbon target by 2030 and carbon neutrality by 2050.

The Commission's initial Carbon Plan should focus on the selection of resources and retirements that will achieve the 2030 target, the near-term actions to support those selections and retirements, as well as steps to prepare for longer-lead-time resources that will continue reducing emissions over the next decades. Given the uncertainties of planning for later years, it is expected that the mix of resources and timing will evolve as the Carbon Plan is updated.⁴⁶ This section briefly summarizes alternative portfolios that have been proposed to achieve the 2030 deadline. The following sections will provide more details about specific resource selections.

Duke and intervenors have presented the Commission with a number of portfolios that aim to achieve the 2030 carbon reduction targets: Duke's P1 portfolio;⁴⁷ the AGO's SP-AGO portfolio prepared by Strategen Consulting,⁴⁸ the North Carolina Sustainable Energy Association, Southern Alliance for Clean Energy, Sierra Club, and Natural Resources Defense Council's (together, CLEAN Intervenors) Optimized and Regional Resources portfolios prepared by Synapse

⁴⁶ Duke Verified Petition at 8 ("HB 951 contemplates that plan development must be an iterative process that allow the plan to be re-evaluated at least every two years and 'adjusted as necessary.'" Also see Public Staff witness Thomas testimony that "technologies advance quickly, and ... 18 years ago no one thought that solar and batter storage and wind would be playing such a pivotal role in this decarbonization...." (T22 p 262-63)

⁴⁷ Duke Carbon Plan, Chapter 3 at 8, T7, p 33. Note, however, that Duke's P1 portfolio does not accomplish N.C.G.S. § 62-110.9's carbon reduction targets under the alternative gas supply scenario. Appendix E, p 89; Carbon-Free by 2050 Report at 40, T25, p 33.

⁴⁸ Corrected AGO Burgess Exhibit 2, T25, p 345.

Energy Economics;⁴⁹ the Tech Customers' Preferred Portfolio prepared by Gabel Associates;⁵⁰ and the Clean Power Suppliers Association's (CPSA) CPSA1, CPSA2, and CPSA3 portfolios prepared by the Brattle Group.⁵¹ Modeling was performed by Duke, Strategen, Synapse, and Gabel using EnCompass software to select optimum resources. Intervenor's modeling made revisions to some Duke inputs and assumptions or left out certain "out of model" steps. The reasons for the departures from some of Duke's inputs and assumptions are detailed in Sections IV, V, and VII. Modeling for CPSA used a Brattle model called GridSIM. For modeling purposes, CPSA preserved many of Duke's inputs and assumptions even though it did not fully agree with them in order to "focus their attention only on those issues of greatest import"—primarily solar interconnection limits.⁵²

The portfolios designed to meet the 2030 target share a number of common features and several important distinctions:

- Solar: All of the portfolios selected solar as optimal least cost resources to provide large amounts of incremental capacity (nominally) by 2030. The amounts range from 5,200 MW to 9,500 MW.⁵³
- Storage: All of the portfolios selected between 1,800 MW to 8,150 MW of stand-alone or storage paired with solar.⁵⁴

⁴⁹ Carbon-Free by 2050 Report Table 2 at 4-5. T25, p 33.

⁵⁰ Tech witness Roumpani Table of Resource Additions in the Preferred Portfolio (MW) (T25 p 88)

⁵¹ CPSA witness Hagerty Table 6: Summary of New Resource Additions and System Costs (T 25 p 442)

⁵² Initial Comments of CPSA at 8.

⁵³ Supra notes 47-51.

⁵⁴ Id.

- Grid Edge: Duke proposes to rely on Energy Efficiency measures, Demand Side Management, and similar customer programs to reduce load by 1%.⁵⁵ While not supporting Duke's target, some parties, including the AGO, utilized the 1% load reduction for modeling purposes. (T25, pp 280-81 ("No adjustments made due to time constraints.")). CLEAN Intervenor's portfolios modeled the programs ramping up to provide a 1.5% reduction of total retail load by 2030. (Carbon-Free by 2050 Report, Table 2 at 4-5, T25, p 33)
- Onshore wind: The portfolios selected between 600 and 900 MW of in-state onshore wind. In addition, some portfolios selected up to 2,500 MW of imported onshore wind.⁵⁶ Duke's modeling constrained the selection of imported wind in significant part due to Duke's argument that purchased power arrangements cannot be selected as a least cost resource to meet the Carbon Plan. Section II discusses this legal argument in more detail. Duke also testified that transmission of imported wind pushed the cost too high for selection as a least cost resource. (T12 p 30) However other parties modeled imported wind and found that wind was selected in significant amounts as a least cost resource even when a firm transmission rate is added and especially when it is not. (Analysis of Duke Energy 2022 Carbon Plan at 22, T25, p 345; Carbon-Free by 2050 Report at 14, T25, p 33)

⁵⁵ Duke Carbon Plan, Appendix G, Table G-5, T7, p 33.

⁵⁶ Supra nn. 47-51; Carbon-Free by 2050 Report, Table 2, T25, p 33.

- Offshore wind: Many of the portfolios supported Duke's proposal to add 800 MW of offshore wind; however, CPSA1 and the Tech Customers' Preferred Portfolio did not select any offshore wind prior to 2030.
- Natural gas generation: Duke's P1 portfolio would add 2,430 MW of combined cycle (CC) units and 1,128 MW of combustion turbine (CT) units to meet the 2030 target. The CPSA2 portfolio would add a similar amount. The remaining portfolios suggested that significantly less new natural gas generation is necessary and could be added late in the decade, which would allow selection to be deferred until the next Carbon Plan. SP-AGO required no new CC units and CTs were limited to under 500 MW.⁵⁷ The CLEAN Intervenors' portfolios required no new natural gas.⁵⁸
- Belews Creek Conversion: Duke's modeling did not allow for the conversion of Belews Creek to run entirely on natural gas. Other modeling parties maintained this limitation due to the condensed timeframe in this proceeding. However, the SP-AGO portfolio included the conversion of Belews Creek as it is a cheaper option for reducing carbon emission to meet the 2030 carbon reduction target than new natural gas generation.(T25 pp 280-81, 283)
- Coal plant retirements: The retirement of coal units was not consistent across the portfolios that were designed to achieve the 2030 target. Under Duke's P1 portfolio, all sub-critical coal units were retired by

⁵⁷ Corrected AGO Burgess Exhibit 2, T25, p 345.

⁵⁸ Supra nn.47-51.

2029.⁵⁹ However, Duke's proposed Carbon Plan postponed other coal retirements beyond the dates that the EnCompass model economically (endogenously) selected. Other portfolios, including the SP-AGO portfolio, used earlier, more economic retirement dates. The SP-AGO portfolio was the only portfolio that proposed conversion of Belews Creek 1 and 2 to run entirely on natural gas by 2028. (T25, p 281)

IV. THE COMMISSION SHOULD PURSUE NEAR-TERM ACTIONS CONSISTENT WITH THE SP-AGO PORTFOLIO.

As discussed above, the Commission is required to develop a plan that commits to achieving 70% carbon emissions reductions by 2030. The near-term actions authorized by the Commission's Carbon Plan are critical determinations as they will influence upcoming certificate applications for new generation, and, to the extent that some requests made in Duke's Petition are allowed, ratepayers will bear considerable financial risk for Duke's preliminary research and development activities even for resources that are never built.

The AGO makes the following recommendations about near-term actions, which are based primarily on the SP-AGO portfolio and focus on those to take in 2022, 2023, and 2023 that will advance the Carbon Plan. The AGO believes that the SP-AGO portfolio presented in the direct testimony of Edward Burgess presents the most reasonable portfolio for achieving 70% carbon reductions by 2030. (T25, pp 233-236) The SP-AGO portfolio builds off of the work that Duke performed on behalf of the Public Staff in its SP5 portfolio and improves that

⁵⁹ Duke Proposed Plan Table 1 Executive Summary p 16; Carbon-Free by 2050 Report, Table 5 at 19, T25, p 33.

portfolio in a number of ways. (T25, p 234) Duke and other parties have reviewed the SP-AGO portfolio, and no party critiqued its findings either in rebuttal testimony or via cross examination.

The SP-AGO portfolio has the following advantages over Duke's proposed portfolios:

- It achieves the 70% carbon reduction by 2030. By comparison, only Duke's P1 portfolio achieves that target by 2030.
- SP-AGO maximizes federal funds available under the Inflation Reduction Act by relying more on renewable resources and storage while deferring additions of natural gas generation.
- It achieves the 70% carbon reduction target with a lower present value revenue requirement than Duke's P1 portfolio. (Corrected AGO Burgess Exhibit 2, T25, p 345) Duke's remaining portfolios achieve lower present value revenue requirements in large part by postponing coal unit retirements and failing to achieve 70% carbon reductions by 2030.
- It avoids reliability risks that stem from an overreliance on natural gas generation without securing sufficient firm transportation.
- It protects ratepayers from the risks posed by fuel price volatility.
- It converts Belews Creek to run exclusively on natural gas as a lower cost way to bridge the gap between coal unit retirements and when longer-term, carbon free resources are constructed.

- It uses endogenously determined retirement dates for coal units, thus accelerating carbon emissions reductions.
- SP-AGO does not rely on unproven or risky technologies to achieve the 70% carbon reduction target. Duke's P3 and P4 portfolios do not meet the target until 2034, and only meet the target then by counting on the installation of SMRs prior to 2034. (Duke Carbon Plan, Chapter 3 at 10-11, T7, p 33) Further, all four of Duke's proposed portfolios rely on the eventual conversion of natural gas generation to operate exclusively on hydrogen when evaluating how long those units will operate and allowing their selection as part of the longer term plan to achieve carbon neutrality. (Duke Carbon Plan, Chapter 3 at 8-11, T7, p 33)

Details follow about AGO recommendations for near-term actions.

- A.** Duke should initiate competitive procurements of solar in order to add 1,125 MW in 2022, 1,275 MW in 2023, and 1,800 MW in 2024 to be in service by 2027, 2028, and 2029 respectively and commit to speeding up the pace of interconnections.

The AGO recommends selecting 4,200 MW of incremental solar as part of the Carbon Plan's near-term actions: 1,125 MW in 2022 to be in service before 2027, 1,275 MW in 2023 to be in service before 2028, and 1,800 MW in 2024 to be in service before 2029.⁶⁰ (T25, p 250-51)

⁶⁰ Duke has implied that AGO witness Burgess supports Duke's near term proposal to add less solar capacity, but his testimony was that the smaller amount of Duke's P1 procurement volumes were "no regrets" procurement volumes, or in other words, they should be a floor, not that they are appropriate. (T25, p 294)

Throughout this proceeding, there has been much discussion about the appropriate amount of annual solar to add under the near-term action plan. The reason this issue has garnered so much attention is simple: utility-scale solar, particularly when paired with battery storage, is a low-cost, carbon-free resource. Duke's modeling showed that annual interconnection limits imposed binding constraints, meaning that the model would have selected more solar as the least cost resource but, but was forced to make less economic selections in light of that constraint. (T21, p 314; T8, pp 74-75) Duke needs to set goals for maximizing annual solar interconnections that are no less ambitious than the goals Duke has set for advancement of offshore wind and emerging technologies like SMRs and hydrogen fuel development, not to mention Duke's ambitious goals regarding the future deliverability of low-cost natural gas. By comparison, setting ambitious goals for increasing the capacity to interconnect solar resources promises a more achievable and lower cost alternative. (T26, p 80-81) Because the Commission must pursue the least cost pathway to achieving the carbon reduction targets in N.C.G.S. § 62-110.9, it is critical that the Commission maximize the achievable amount of solar interconnections.

- i. Duke's near-term procurements for solar resources are insufficient and not founded on sound assumptions.

Duke's Verified Petition proposes the near-term procurement of 3,100 MW of incremental solar through 2029. This proposal is inadequate to support the 5,400 MW of incremental solar selected under its P1 portfolio by 2030.⁶¹ (Duke

⁶¹ Duke's near-term proposal to procure 3,100 MW of solar does not include the remaining 441 MW of CPRE procurements. The Commission has sought comments in Docket Nos. E-2, Sub 1159, E-2, Sub 1297, E-7, Sub 1156, and E-7, Sub 1268 regarding their treatment. For clarity of

Carbon Plan, Chapter 3, Table 3-3, T7, p 33) The proposed near-term amount means that an additional 2,300 MW of solar would need to be procured in 2029 in order to meet Duke's P1 portfolio. No party has argued that it is reasonable to assume that Duke can interconnect 2,300 MW of solar resources in 2029.

Duke's near-term action plan fails to maximize the amount of solar that Duke assumed could be interconnected for modeling purposes. In its P1 portfolio, Duke used annual solar interconnection caps of 750 MW in 2027, 1,050 MW in 2028, and 1,800 MW in 2029. (Table 11, Direct Testimony of Duke Modeling Panel, T7, p 188) Those assumed maximum interconnection amounts tally to 3,600 MW and leave a more reasonable 1,800 MW balance to interconnect by the beginning of 2030.

Duke acknowledged that the amount of solar sought in the near-term action plan is currently inadequate to support the P1 portfolio. (T27, p 58) However, Duke suggests that this proposal is reasonable because the amounts may become sufficient if the Commission approves a volumetric adjustment mechanism for future solar procurements as it did in the 2022 Solar Procurement, and the volume adjustment increases purchases as much as allowed in each and every procurement. (T27, pp 59-60) The 2022 Solar Procurement Final RFP filed in Dockets Nos. E-2, Sub 1297 and E-7, Sub 1268 on June 17, 2022 includes a volume adjustment mechanism that allows the target volume to be increased by as much as twenty percent if bid prices come in lower than anticipated. However,

the record, the 441 MW of CPRE shortfall were considered in the system solar baseline in Duke's modeling and are similarly not included in the AGO's recommended near-term actions for procurements in 2022, 2023 and 2024. (T27, pp 58-59)

volumes may also be decreased by as much as twenty percent down to a 700 MW minimum target if bid prices come in higher than anticipated. Since bid prices must come in lower than (not comparable to) anticipated prices in order to trigger the adjustment mechanism, increased purchases may not occur even if sufficient solar projects bid in at about the price anticipated by Duke. (T27, pp 174-76)

The AGO supports the concept of a volume adjustment mechanism to protect ratepayers, but the current mechanism may need to be refined in future solar procurements to ensure that cost-effective solar procurements are maximized. Further, the Commission should ensure that the solar procurements minimum target volumes are not set to a level that makes it impossible for the Commission to meet the carbon reduction targets. The adjustment mechanism should not distract attention from the critical importance of evaluating the reasonableness of Duke's assumption about how much solar capacity can be interconnected annually.

Duke's assumptions about the limits to its capacity to interconnect solar resources are not well supported and the evidence indicates that significantly more solar can be interconnected than the amounts used in Duke's modeling. No comprehensive study was performed to support the annual solar interconnection constraints used by Duke nor did Duke have "specific underlying calculations for the annual selection constraints." (T25, p 250) Instead, these numbers appear to be based on historic trends for interconnections⁶² and "engineering judgment and transmission planning experience." (T25, p 250) Duke witness Kalemba testified

⁶² Duke Carbon Plan, Appendix I at 7, T7, p 33.

that the 750 MW limit in 2027 was simply a “reasonable assumption” based on the number of projects that did not require transmission system upgrades. (T8, p 42). However, he also testified that of the approximately 5,000 MW of solar resource studied as part of the 2022 Definitive Interconnection System Impact Study (DISIS) process, 1,500 MW are available without requiring transmission projects to be completed in the proposed Red Zone Expansion Plan (RZEP). (T8, p 41; T16, 172)

Further, Duke plans for 11 of the 18 projects in the RZEP to be completed by June of 2026. (CPSA Modeling Panel Direct Cross Exhibit 1, T8, p 148) Therefore, some portion of the remaining 3,500 MW of 2022 DSIS projects will be enabled by those projects. Completing all of the RZEP projects will support interconnection of at least 5,400 MW of solar—more than the amount called for in the near-term under SP-AGO portfolio. (T16, p 160) In fact, Duke witness Roberts testified that the RZEP projects would support even more than 5,400 MW, but that the exact amount is not known at this time. (T16, pp 162-63) These remaining RZEP projects would be completed by June of 2027. (CPSA Modeling Panel Direct Cross Exhibit 1, T8, p 148; T16, p 163)

Regarding the 1,800 MW annual interconnection limit in 2029 and beyond, Duke witness Kalemba acknowledged that achieving that number “is possible,” but that “there are things we need to do to get there[.]” (T8, p 44) Duke never determined that the “things we need to do to get there” were cost prohibitive. In fact, Duke witness Kalemba acknowledged that waiting to interconnect additional solar increases costs. (T8, p 45) Duke’s IRA analysis reinforced this fact, showing

that inflationary pressures may increase the cost of solar procurements in the future. (Duke Late-filed Exhibit 1)

Thus, Duke's near-term action plan proposes procuring fewer low-cost solar resources than it could interconnect. The risk of procuring fewer solar resources than Duke is able to interconnect is that the portfolio would be more expensive than it otherwise would have been—it would no longer represent “least cost path to compliance.” The converse risk, procuring more solar resources than Duke will be able to interconnect, is minor in comparison. Duke's witnesses testified regarding a few of the potential downfalls: less ability to take advantage of declining cost curves, potential technological advances, and the need to select more expensive bids. (T8, pp 91-94) However, Duke did not attempt to quantify the impact of those pitfalls and how those impacts compare to the ratepayer savings achieved by removing constraints and allowing additional solar resources. (T8, p 98) Public Staff witness Thomas advocated in favor of “stress[ing] the interconnection process to see what we can really achieve” and accelerating carbon reductions. (T22, 295) The choice this presents for the Commission is whether to aim high and potentially need to adjust downwards in future Carbon Plan proceedings, or to aim low, leaving low-hanging “least cost” fruit and potentially failing to meet the statutory deadline.

Because the Commission must pursue the least cost pathway to achieving the carbon reduction targets in N.C.G.S. § 62-110.9, the Commission should maximize the achievable amount of solar interconnections. The AGO recommends that the Commission select procurement amounts that are necessary to support

achieving the 2030 carbon reduction targets without relying on volume adjustment outcomes. Therefore, the Carbon Plan should include near-term actions to support adding minimum target volumes of 1,125 MW in 2022, 1,275 MW in 2023, and 1,800 MW in 2024 with target in-service dates of 2027, 2028, and 2029 respectively as recommended by AGO witness Burgess. (T25, p 251)

- ii. Solar procurements should maximize the amount of long duration solar plus storage.

Solar plus storage, especially configurations with long-duration batteries and higher battery ratios, provides many benefits to the system by: meeting peak loads, maximizing interconnection limits, and providing higher capacity values than standalone storage. (Analysis of Duke Energy 2022 Carbon Plan at 15-19, T25, p 345) Duke acknowledged that configurations with long-duration batteries and higher battery ratios “would have provided additional capacity value;” however, “the Company believed that the incremental capital cost for the larger battery would not have yielded a high enough energy output to justify the added expense.” (Analysis of Duke Energy 2022 Carbon Plan at 16, T25, p 345)

As discussed in Section V and VII, Duke’s modeling included a number of questionable constraints that limited the amount of solar plus storage that was selected by the EnCompass model. As demonstrated by the SP-AGO modeling, without these constraints far more solar plus storage would have been selected. (Corrected AGO Burgess Exhibit 2, T25, p 345) SP-AGO did not address all of the questionable constraints in Duke’s modeling due to the compressed timeframe of this proceeding, and the amounts of solar plus storage in SP-AGO are a reasonable floor in the near-term until these modeling problems can be corrected

prior to the 2024 Carbon Plan. This finding will likely be bolstered by the Inflation Reduction Act.

While the SP-AGO portfolio resolves many of the modeling flaws in Duke's initial Carbon Plan modeling, one additional concern is that solar plus storage was not modeled with bidirectional charging.⁶³ (T8, p 49) The EnCompass software does not currently have the ability to model that feature of solar plus storage. (T8 pp 49-50) Despite making other out-of-model adjustments to its resource portfolio, described below in Sections V and VII, witness Kalemba testified that no similar adjustment was made in order to capture the value of this capability. (T8, pp 50-51; T27, pp 17-18) Until the EnCompass software is able to fully reflect the value of bidirectional charging, any modeling results are likely to understate the value of solar plus storage resources. Therefore, the AGO recommends maximizing the estimated amount of long duration solar plus storage in the near-term with the expectation that the 2024 Carbon Plan will be developed with the ability to model bidirectional charging.

B. Additional CC units are not necessary and the Commission should defer planning for the construction of a single CT until the 2024 Carbon Plan update.

Under the SP-AGO portfolio, no new CC units were added. (T25, 282) A single new CT unit was selected at the end of 2028 in the DEP territory. (T25, 282) Duke's initial and supplemental portfolios add two CC units in approximately 2029. (T25, 297) Duke's IRA sensitivity removed one of those two CC units. (Duke Late-filed Exhibit 1, Table IRA-6) Duke testified that the typical construction time for a

⁶³ Bidirectional charging refers to two-way charging that allows the battery to charge from and discharge to the grid.

new CC is four to five years and just three to four years for CTs. (T10, p 114) Other companies have constructed new natural gas units even faster. (T10, pp 116-118) Therefore, the Commission does not need to approve construction of any new natural gas plants in this proceeding and can wait until the 2024 Carbon Plan to determine whether new natural gas units are necessary. For the reasons explained below, it would be prudent for the Commission to delay approving new natural gas units at this time.

- i. Duke's analysis shows converting Belews Creek to operate entirely on natural gas may offer a more economic option than building new natural gas generating facilities.

Duke stated that convert Belews Creek to operate entirely on natural gas would cost between [BEGIN CONFIDENTIAL] ■ ■■■■■ [END CONFIDENTIAL] and would take about [BEGIN CONFIDENTIAL] ■■■■■ [END CONFIDENTIAL] (Duke Confidential Late-filed Exhibit 2) By comparison, Duke estimates that building a new CC with half the capacity would cost [BEGIN CONFIDENTIAL] ■■■■■ ■■■■■.⁶⁴ [END CONFIDENTIAL] Therefore, conversion of Belews Creek costs between [BEGIN CONFIDENTIAL] ■■■■■ [END CONFIDENTIAL] less than building a new natural gas unit. Duke witness Snider also testified that construction of a new CC would also take longer than conversion of Belews Creek. (T10, pp 113-14) Nevertheless, Duke did not include an option for the conversion of Belews Creek in its modeling. (T 25, p 290-91) Duke stated that it did not do so because it believed it was uneconomic. (T27, p 85) It is important to note that the study Duke

⁶⁴ Strategen, Analysis of Duke Energy 2022 Carbon Plan at 39 (Admitted into evidence, T25, p 345).

used to support that decision was conducted prior to the passage of House Bill 951 and was not a portfolio-wide analysis. (T27, p 85)

Converting Belews Creek also presents many logistical advantages over building a new natural gas unit. Because it currently uses dual-fuel operation, Belews Creek already has natural gas infrastructure in place. (T25, p 339) Duke's analysis showed that upgrading the existing supply would be relatively affordable. (T25, p 339) Any concerns about obtaining sufficient interstate capacity would also exist for new CCs. (T25, p 340) Conversion of Belews Creek will take approximately the same amount of time as the construction of a new CC—allowing it to be online to support the 2030 carbon reduction target.

It is true that the converted Belews Creek units would be less efficient than a newly constructed natural gas unit. (T25, pp 340-41) But, it is important to consider how these decreased operational efficiencies compare to the overall cost savings. (T25, p 340) The fact that the plant would be less efficient should be weighed alongside the role that the units would play on Duke's system compared to a new CC. (T25, p 341) The converted Belews Creek units will largely serve as a capacity resource and address energy needs for a short period of time in the 2020s. (T25, pp 342-43) Additionally, the converted Belews Creek units, like many of Duke's natural gas units, is meant to serve as a bridge until additional carbon free resources can be added to the system throughout the 2020s and 2030s. (T21, p 329)

- ii. Delaying approval of development of new CCs will allow more time to determine whether current natural gas price trends are temporary.

Duke's initial modeling was conducted prior to the recent and significant increase in natural gas prices. (T25, p 264) Duke and the Public Staff assume that these impacts are transitory. (T8, p 33; T21, pp 71-73) However, there is no guarantee that this is the case. Duke concedes that the long-term market price for natural gas has increased by nearly 20% compared to its original assumptions. (T7, p 368) Other potential resource options do not have the same fuel cost risks. (T27, pp 142-43) The risk of continued high natural gas prices falls unevenly on ratepayers. (T21, pp 326-27) The Commission need not expose ratepayers to this unnecessary risk. Under the SP-AGO portfolio no new CCs are selected and no new CTs are selected until late 2028.

- iii. Delaying approval of development of new CCs will allow more time to determine whether additional firm natural gas supply can be secured.

Duke's base fuel supply assumption was that Duke will be able to obtain firm transportation to supply its existing CC fleet as well as a limited number of new CC units. (T25, p 266) This assumption is dubious and potentially causes reliability risks for consumers. Duke's initial portfolios assumed that it would be able to secure firm transportation via the Mountain Valley Pipeline. (T25, p 266) The Public Staff shared concerns about the feasibility of this plan. (T21, p 74; T22, p 257) The SP5 and SP6 portfolios assumed that they would be able to secure firm transportation to Transco Zone 4. (T25, p 266) The Public Staff did not know whether there is even enough firm transportation to Transco Zone 4 for its existing

fleet—much less additional units. (T22, p 259) Either of these scenarios would require additional pipeline capacity. (T25, pp 266-67)

- iv. Delaying approval of development of new CCs will allow more time to determine whether clean hydrogen is progressing towards commercial availability at the prices Duke anticipates.

Duke's modeling used a 35-year lifetime for new natural gas units. (T25, p 271) This means that any new CCs or CTs will operate beyond the 2050 carbon neutrality deadline under N.C.G.S. § 62-110.9. Duke claims that any new gas plants added in the near-term will eventually be converted to operate on 100% hydrogen. (T25, p 271) Clean hydrogen is not currently commercially available at the scale or cost necessary to support this conversion. (Analysis of Duke Energy 2022 Carbon Plan at 28-30, T25 p 345) If clean hydrogen fuel fails to materialize as anticipated, Duke will be required to either retire natural gas units early or operate the units sparingly up to the amount allowed under N.C.G.S. § 62-110.9's offset language. (T8, pp 64-65)

Duke did not present sufficient evidence to support a finding that it will be able to supply its natural gas units with sufficient, cost-effective green hydrogen. Duke's analysis of whether green hydrogen will be available in sufficient quantities was superficial. Duke calculated that curtailed carbon-free energy would be sufficient to produce nearly half of the required hydrogen in 2050, but did not address the remaining hydrogen needs in 2050 and beyond. (T25, 272) AGO witness Burgess testified to various ways that Duke's analysis was insufficient. (T25, 272)

Similarly, Duke did not present sufficient evidence to support a finding that it will be able to operate its natural gas units under the offset allowance.

Duke failed to present sufficient evidence to support that either green hydrogen or offsets are likely to become available. Therefore, there is an appreciable risk that any new natural gas units will be forced to retire before 2050—saddling ratepayers with any unrecovered balance. By delaying approval of new CCs, the Commission can avoid this risk.

C. Duke should be ordered to retire its remaining coal units according to the economically selected retirement dates.

Duke's proposed Carbon Plan made significant changes to the economically selected retirement dates of its coal generation facilities. (T25, p 284) For the Mayo 1 unit as well as Marshall 1 and 2 units, retirement was delayed three years from 2026 until 2029. (T25, pp 285-86) For Belews Creek 1 and 2, retirement was delayed six years from 2030 to 2036. (T25, pp 285-86) Under the SP-AGO portfolio, this flaw was remedied, leading to savings for ratepayers and drastic carbon reductions. (T25, pp 282, 289-90)

Duke acknowledged that it is feasible to retire its remaining coal units by the economically selected retirement dates. (T25, p 292) The delays in retirement were in order to avoid certain transmission concerns. (T16, p 207; T25, p 286) However, Duke acknowledged that many of those concerns can be avoided by siting replacement generation at the location of retiring units. (T25, pp 285-86) Battery storage resources could be sited at the retiring coal facilities to help avoid transmission upgrades and leverage IRA funds for standalone battery storage. (T25, p 292; T27, pp 205-206)

Further, if replacement generation is not possible, there are transmission upgrades that can resolve the concerns. (T16, p 217) Any additional transmission

upgrades that are necessary can be completed prior to 2030. (T25, p 287) Public Staff witness Thomas acknowledged that if procurements of other resources fail to materialize as expected, Duke will be able to “check and adjust” the retirement dates of coal generating units to avoid any reliability concerns. (T21, p 301) Witness Thomas testified that he did not believe taking that approach would have any negative consequences compared to initially targeting a later retirement date. (T21, p 301)

Delaying retirement of Duke’s remaining coal generating facilities negatively impacts ratepayers. By operating coal generating units beyond their economically selected retirements, more affordable resources are “forced out.” (Burgess Testimony) Delaying coal retirements also minimizes the benefits of securitization for ratepayers. (T23, p 235) The impact of these forgone benefits can be tens to hundreds of millions of dollars. (T23, p 235) The IRA has provisions that, similar to securitization, allow for the ratepayers to benefit from accelerated coal retirements. (T23, p 236)

D. Duke should initiate competitive procurements of Carolinas onshore wind with target volumes of 300 MW in 2023, 300 MW in 2024, and 300 MW in 2025 with target in-service dates of 2027, 2028, and 2029 respectively.

Duke should immediately initiate competitive procurements for Carolinas onshore wind in order to test the ability and willingness of the market. Wind energy has a “synergistic effect” with other resources, which gives it a unique value to the system. (T11, p 100) Duke’s modeling included an unjustified cumulative limit on onshore wind additions. The SP-AGO modeling removed this cumulative limit. (T25, p 280) This resulted in the SP-AGO portfolio selecting an additional 300

MW—a total of 900 MW by 2030—of onshore wind. (Corrected Burgess Exhibit 2, T25, p 345) This represented the maximum available due to the annual constraint with 300 MW selected in each of the first three years the resource was available.

Onshore wind is a mature generation resource that has been developed in the United States. (T25, p 254) In the PJM territory, over 2,400 MW of onshore wind projects are currently being developed with development times of 2-3 years. (T25, p 255) This means that substantially more onshore wind can be developed and in a shorter timeframe than Duke has assumed.

It is clear that there are limitations on the availability of onshore wind in the Carolinas (T11, pp 97-101) Therefore, the SP-AGO modeling maintained the 300 MW annual limit on onshore wind additions. However, just because large amounts of onshore wind have yet to be built in the Carolinas does not mean that they cannot be. Duke witness Snider acknowledged that the 300 MW target was conservative. (T11, p 101) No competitive solicitation has occurred in the Carolinas for onshore wind. (T18, p 124-25) Duke has not held any stakeholder workshops with developers. (T18, p 125) As a result, the 600 MW cumulative limit in Duke's modeling does not represent what is commercially available. Therefore, it is premature to implement a cumulative cap before testing the market to see what volumes are obtainable.

Further, the SP-AGO modeling reflected the transmission challenges that may come with added onshore wind. A proxy cost was added in the modeling to reflect any transmission upgrades needed to enable onshore wind. (T11, p 97) This transmission cost used for onshore wind was \$0.24/W, which was as high as

or higher than any other land-based resource. (Duke Carbon Plan, Appendix E, Table E-44, T7, p 33) Still, the SP-AGO modeling continued to economically select onshore wind.

The Commission should direct Duke to initiate a competitive procurement for the amounts of in-state onshore wind selected in the SP-AGO portfolio with similar volume adjustment mechanisms to the solar procurements discussed above. Doing so would ensure that ratepayers can benefit from the lowest cost resources available. If Duke's fears regarding the availability of onshore wind prove correct, the 2024 Carbon Plan presents an opportunity to incorporate the results of those competitive procurements.

E. Duke should begin necessary activities to support adding 450 MW of imported onshore wind in both 2027 and 2028.

The SP-AGO portfolio called for importing 450 MW of onshore wind in 2027 and an additional 450 MW in 2028. As explained in Section II, N.C.G.S. § 62-110.9 allows for the inclusion of imported third-party resources in the Commission's Carbon Plan. Duke has long imported wind energy from neighboring areas to ensure reliability and meet peak demand. (T9, pp 18-19) Imports also help to reduce resource requirements and decrease reserve margins. (T25, p 60) All of Duke's proposed portfolios include some imported wind; however, Duke implemented cumulative caps on the amount of wind that could be imported. (T25, p 254-55) For DEC, the amount of imported wind was capped at 150 MW. (T25, p 254) No wind was allowed to be imported by DEP. (T25, pp 254-55)

Duke did not include additional imports of Midwestern wind as a selectable resource for its modeling because it was not considered "economically feasible at

this time.” (T16, p 104) The purpose of using a program such as EnCompass is to allow for an objective determination as to whether an economic investment is justified.

In order to model imported onshore wind, Duke included a firm point-to-point transmission cost adder based on PJM’s Firm Point-to-Point Transmission Service. (T17, pp 27-28) That assumption added \$67,625/MW-yr for imports from PJM or approximately \$26/MWh for a wind resource with a 30% capacity factor. AGO witness Burgess showed that Duke’s reliance on Firm Point-to-Point transmission service for wind may be overly limiting. (T25, pp 254-55) In SP-AGO, the model was allowed to import wind using non-firm transmission, but assumed that the imports provided no capacity value.⁶⁵ (T25, pp 281-82) Using a non-firm transmission adder had a significant impact on the cost of imported wind. PJM’s Non-Firm Point-to-Pont Transmission Service is discounted to just \$0.67/MWh, significantly less than \$26/MWh used by Duke. (Analysis of Duke Energy 2022 Carbon Plan at 22, T25, p 345)

Similarly, Synapse’s Regional Resources portfolio selected imported wind. That portfolio used an input for imported wind that imitated Midwest wind resources identified in the North Carolina Transmission Planning Consortium’s 2021 Public Policy Study, and included the PJM border charge for firm point-to-point transmission service.⁶⁶ (T25, pp 27-28; Carbon-Free by 2050 Report, T25, p 33) CLEAN Intervenor witness Fitch testified that this cost included “include any

⁶⁵ This assumption about capacity value was consistent with Astrapé’s recommendations in Duke’s 2020 resource adequacy study. (T25, p 59)

⁶⁶ Carbon-Free by 2050 Report at 14, T25, p 33.

upgrades needed to the transmission system plus the wheeling charges[.]” (T25, p 28) The modeling continued to select high volumes of imported onshore wind. (T24, p 264) A comparison of CLEAN Intervenor’s Regional Resources portfolio and Optimized portfolio, which are identical besides the inclusion of imported onshore wind, showed that inclusion of these resources resulted in a decrease in 2050 PVRR of nearly \$5 billion. (T24, pp 132, 151)

These results show that, despite Duke’s assertion to the contrary, economics are not and should not be the reason for limiting imported onshore wind. Even with annual limits and proxy costs, the SP-AGO, the Regional Resources portfolio, and Duke’s modeling selected onshore wind when available. (Corrected AGO Buress Exhibit 2, T25, p 345; Carbon-Free by 2050, T25, p 33; Duke Carbon Plan, Chapter 3, Table 3-3, T7, p 33)

Instead, the only reasonable rationale for limiting imports of onshore wind is technical feasibility. Duke stated that the required transmission upgrades necessary to enable importing Midwest wind would take “up to 84 months.” (T16, 105) However, the study Duke used to justify that estimate was not comprehensive. It looked only at imports via PJM. (T16, pp 224-25) Additional power could be procured via the Tennessee Valley Authority, Southern Company, or any other neighboring balancing area. (T16, pp 225-26) Therefore, Duke has not provided a sufficient justification for limiting imports of onshore wind. The SP-AGO portfolio recognizes the value that this resource can give to ratepayers, but maintains reasonable, objective limits on the amounts that are added.

F. The Commission should carefully evaluate potential offshore wind options and order Duke to begin development activities necessary to procure 800 MW of the least cost offshore wind by the end of 2029.

Like Duke's P1 and P2 portfolios, the SP-AGO portfolio includes 800 MW of offshore wind by the end of 2029. (Corrected AGO Burgess Exhibit 2, T25 p 345) This aligns with the recommendations of other intervenors as well. (T24, p 178) This also aligns with Governor Cooper's Executive Order 218, which acknowledges that North Carolina has "the highest technical potential for offshore wind power on the east coast of the United States" and called for the State to develop 2.8 GW of offshore wind by 2030. Duke acknowledges that offshore wind is "an established technology." (T27, p 255) Over 55 gigawatts (GW) of offshore wind are in operation globally. (T23, p 165) Inclusion of offshore wind has many benefits, including "generation shape diversity" and supply chain diversity. (T23, p 166) Duke witness Snider testified that without beginning development activities prior to the 2024 Carbon Plan to ensure 800 MW is in operation by the end of 2029, "meeting the interim emissions reduction targets by 2030 would be exceedingly challenging[.]" (T27, 98)

However, the AGO is concerned that Duke's plan to acquire the lease of its affiliate without a robust, independent comparison of the three available offshore wind lease areas may not lead to the least cost mix of generation resources. The AGO agrees with Public Staff witness Boswell that it is "premature at this time to make any determination with respect to an affiliate transfer." (T23, p 122) Duke stated that procuring offshore wind from other wind lease areas "carries timing, cost, and certainty risk in contrast" with purchasing the wind lease area of Duke's affiliate. (T29, p 95) "Affiliate transactions raise issues of considerable concern to

the Commission.” Order on Annual Review of Gas Costs, Docket No. G-21, Sub 393 (Mar. 19, 2001); N.C.G.S. § 62-153. The Commission should give particular scrutiny to this transaction and should ensure that Duke is selecting the least cost offshore wind available.

The AGO does not believe that studying the various wind lease areas will delay procurement of the necessary offshore wind. Duke witness Pompee testified that the typical offshore wind project takes eight to ten years to develop once a lease is secured. (T18, 80) Duke claims that if the Commission does not give authorization to acquire that lease in this proceeding, “there’s really not an incentive to accelerate development[.]” (T18, p 59) The AGO disagrees. Duke’s affiliate acquired its wind lease for \$155 million. (T18, p 63) Duke acknowledged that there are certain development steps that must be taken by its affiliate in order to maintain its lease that are not dependent on Duke acquiring the lease. (T29, pp 125-131; T23, p 172) Duke witnesses testified that there is no evidence to suggest that the Duke affiliate would cease development of its \$155 million dollar lease area if the Commission does not approve acquisition of the lease. (T18, pp 75-76) Similarly, witnesses for Avangrid Renewables, LLC, the owner of one of the other offshore wind lease areas, testified that they had already begun development and would continue to do so. (T23, p 177-78; T23, 222)

Therefore, the Commission should order a robust, independent comparison of the three available offshore wind lease areas. At the conclusion of that study, the Commission should order Duke to begin any necessary development activities required to procure 800 MW of offshore wind by the end of 2029.

G. Duke should initiate competitive procurements of 1,000 MW battery storage to be in service by 2029.

The Commission should direct Duke to begin competitive procurements of battery storage. The SP-AGO added approximately 300 MW of standalone 4-hour battery storage by 2025 and an additional 700 MW by 2028. (Corrected AGO Burgess Exhibit 2, T25, p 345) In addition, the SP-AGO added 675 MW of 4-hour, 25% battery ratio solar paired with storage in in 2026 and 1,275 MW in 2027. (Corrected AGO Burgess Exhibit 2, T25, p 345) As Duke acknowledged, “energy storage, particularly long-duration energy storage, will become increasingly important to maintaining grid reliability.” (Duke Carbon Plan, Appendix K at 1, T7, p 33) The SP-AGO portfolio therefore supports the near-term procurement activities identified by Duke.

The additions of these battery resources are likely to be solidified by the passage of the IRA. (T25, p 243) The IRA allows standalone storage to claim an Investment Tax Credit (ITC) without needing to be paired with storage and extends the IRC for 10 years. (T25, p 245) This would likely reduce the cost of battery resources by 30% or more from Duke’s assumptions. (T25, p 245) In addition, the IRA introduced a manufacturing production credit that may help reduce costs and alleviate supply chain concerns. (T25, p 245)

These resources also have the ability to be sited at the location of retiring coal facilities, alleviating the need for costly transmission upgrades and enabling earlier coal retirements. (T25, pp at 239, 252, 296) There are already connection procedures in place that can support this effort, “decreas[ing] generator development costs by avoiding transmission upgrades, reducing the

interconnection study time, and reducing construction timelines” (Tech Customers - Gabel Report at 5, T25, p 192)

H. Duke should begin RZEP projects in order to enable increased solar interconnection.

In this proceeding, Duke is seeking authorization for the RZEP projects—15 transmission projects located in the “red zone” a constrained area of eastern North and South Carolina.⁶⁷ (T28, p 135) This area is “fertile ground” for development of utility-scale solar projects due to “land lease rates, the land availability, lack of significant forestation, lack of population density” among other reasons. (T16, p 159) These are areas that Duke would develop solar on its own, even if it were not purchasing from third parties. (T19, p 60-62) Without completion of these projects, Duke acknowledged it would be “extremely challenging” if not impossible to meet the 2030 carbon reduction target. (T16, p 187; T19, p 61)

The total cost for completion of all 15 RZEP projects is approximately \$540 million. (T19, p 36) However, many of these projects are necessary for reasons other than increasing solar interconnections. Duke witness Roberts testified that many of the projects will be replacing aging facilities with newer and more efficient components. (T19 pp 37-38) These costs were included as a transmission adder in Duke’s modeling—showing that even with these increased transmissions costs, solar was selected as the most economic generation resource. (T19, p 45-46, 55)

⁶⁷ Duke’s original request included three additional projects, which Duke maintains are still “needed for interconnecting solar project,” but is not requesting approval for at this time. (T28, 135-36; T16, 74-76)

V. The Commission must develop a plan to achieve the carbon reduction targets and Duke Energy's proposed Carbon Plan should not be adopted.

A. Duke's proposed Carbon Plan is not reasonable for planning purposes due to unreasonable modeling constraints and out-of-model changes.

Duke's Carbon Plan modeling placed arbitrary and unreasonable constraints on several resources. (T25, pp 247-49) These constraints likely played a "significant role in shaping the final portfolio results, especially in the near-term" to the point where the "outcome is almost pre-determined." (T25, p 249; T25, pp 98-99) Because constraints force the model to select more expensive resources, the resulting portfolios do not represent the "least cost" mix of resources. (T25, 249) In addition, Duke conducted a number of "out of model" steps, which are less transparent, less precise, and more subjective than relying on EnCompass' functionality. (T25, pp 256-59; T25, pp 101-104; T24, pp 138-143) These arbitrary constraints and subjective out-of-model steps diminish the value of using an objective modeling like EnCompass and "run the risk of distorting the model results and leading to non-optimal results that increase the portfolio's overall costs." (T25, p 259) The specifics of the constraints and their impact on the resulting portfolios are discussed in detail elsewhere in this brief and in many of the reports submitted in this docket. Due to scope of these problems and the lack of sufficient justifications for their inclusion, Duke's proposed Carbon Plan should not be given significant weight in the Commission's development of the Carbon Plan.

B. Duke's Proposed Portfolios 2, 3, and 4 are not within the Commission's discretion under House Bill 951 to adopt.

As described in Section I, the Commission has a statutory obligation to develop a plan to achieve 70% carbon reductions by 2030 with certain limited exceptions. Duke's P2 portfolio does not plan to achieve that target until 2032. (Duke Carbon Plan, Chapter 3, Figure 3-8, T7, p 33) Duke's P3 and P4 portfolios do not plan to achieve that target until 2034 (Duke Carbon Plan, Chapter 3, Figures 3-8 and 3-9, T7, p 33)

C. Duke's Proposed Portfolio 1 does not comply with the least cost mandate of House Bill 951.

A comparison of Duke's P1 portfolio to portfolios modeled by intervenors shows that Duke's proposal is not least cost. The SP-AGO portfolio achieved the carbon reduction targets of N.C.G.S. § 110.9 for \$1 billion less in PVRR than Duke's P1 portfolio. (Corrected AGO Burgess Exhibit 2, T25, p 345) The Preferred Portfolio proffered by the Tech Customers achieved the carbon reduction targets of N.C.G.S. § 110.9 for approximately \$2 billion less in PVRR than Duke's P1 portfolio. (T25, p 94)

Moreover, the cost comparison likely understates Duke's P1 portfolio relative to portfolios modeled by intervenors. Many of the costs associated with conversion of Duke's natural gas generating fleet to run entirely on green hydrogen are not included in the PVRR of Duke's P1 portfolio. (T25, 271) Further, because intervenor portfolios rely more heavily on solar, wind, and storage resources than Duke's P1 portfolio, and those resources tend to be favored by provisions of the IRA, whereas fossil resources are not, Duke's P1 portfolio will be further disadvantaged from a cost perspective by the passage of the IRA. (T25, p 243)

Therefore, Duke's proposed P1 portfolio is not the least cost means of achieving N.C.G.S. § 110.9's carbon reduction targets and does not comply with the statute's least cost mandate.

D. Duke's proposed near-term action plan is not sufficient to support Portfolio 1.

N.C.G.S. § 110.9 requires that the Commission to "[d]evelop a plan, no later than December 31, 2022, for the utilities to achieve the authorized reduction goals[.]" Part of Duke's proposed Carbon Plan is a suite of near-term actions. However, Duke's proposed near-term action plan is insufficient to "achieve the authorized reduction goals." Duke's near-term action plan proposes to select 3,100 MW of solar generation. (Verified Petition at 16, T7, p 33) However, as described above in Section IV, Duke acknowledged that the amount of solar sought in the near-term action plan is currently inadequate to support the P1 portfolio. (T27, p 58) Instead, the amounts will only become sufficient if the Commission approves an identical volumetric adjustment mechanism for future solar procurements as it did in the 2022 Solar Procurement and the maximum volume adjustment occurs in each and every procurement. (T27, pp 59-60)

E. The Inflation Reduction Act has materially changed many of the key planning assumptions used by Duke to develop its Carbon Plan.

Duke's proposed Carbon Plan was filed in this docket on May 16, 2022. On August 16, 2022, President Biden signed into law the Inflation Reduction Act (IRA), Pub. L. No. 117-169. (T25, p 241) The IRA is "one of the most significant pieces of federal energy legislation in recent decades and will likely have transformational effect on energy investments made over the next decade." (T25, p 241) The IRA

provides approximately \$370 billion in federal funding and tax benefits to advance clean energy goals. (T23, p 241)

Many of the IRA's provisions will lower the costs of new renewable energy projects and provide incentives to accelerate retirements of fossil fuel generation. Key provisions include an expansion of the production tax credit (PTC) for solar and wind projects, an expansion of the investment tax credit (ITC) to include standalone storage projects, ending the offshore wind lease moratorium, and tax credit enhancements for projects placed at retiring coal generating facilities. (T23, p 241-47; T25, pp 245-47) As described above in Section III, other parties' proposed portfolios tend to rely more heavily on solar, wind, and battery resources than Duke's proposed Carbon Plan. Because these resources tend to be favored by provisions of the IRA, Duke's proposed Carbon Plan will do less to leverage those funds and is further disadvantaged by the passage of the IRA. (T25, p 243)

VI. The Commission should not adopt the SP5 or SP6 portfolios.

After initial comments were filed in this proceeding, Duke engaged with the Public Staff in order to conduct two new modeling runs based on the Public Staff's recommended adjustments: Supplemental Portfolio 5 (SP5) and Supplemental Portfolio 6 (SP6).⁶⁸ Duke stated that SP5 and SP6 were simply meant to "test the robustness" of their near-term actions, but that they did not agree with many of the assumptions. (T10, pp 70-71) While the SP5 and SP6 portfolios improve on Duke's proposed portfolios in some respects, they also contain troubling changes that make them unreasonable for planning purposes.

⁶⁸ Duke Energy Letter to the Commission Regarding Development of Supplemental Modeling Portfolios, Docket No. E-100, Sub 179 (July 28, 2022).

A. SP5 and SP6 do not aim to meet the statutory mandate of 70% carbon reductions by 2030.

As discussed above in Section I, the Commission's statutory obligation in this proceeding is to develop a plan for reducing the carbon dioxide emissions attributable to electric generating facilities in the State by 70% by the year 2030. The SP5 portfolio aims to meet that target in 2032, while the SP6 portfolio does not aim to meet that target until 2034. (Modeling Panel Direct Testimony at 57-58, T7, p 188) Public Staff witness Thomas testified that these targets were selected in order to evaluate "the costs and generation resource mixes that would result" and "whether a delay would be in the best interest of ratepayers." (T21, p 39) While this sort of comparative analysis may have been useful if one of the supplemental portfolios used a later compliance date and the other complied with the 2030 target with all other variables being equal, the Public Staff did not do so. The failure to do so is especially confusing in light of the Public Staff's statement that they are "not recommending that the Commission preemptively authorize a delay in meeting the interim compliance goals." (T21, p 40)

B. SP5 and SP6 maintained unnecessary limits on solar and wind additions.

Both Duke's initial modeling and the supplemental modeling included limits on annual wind and solar additions that are overly conservative. As explained above, solar and wind are critical low cost, carbon free resources. By unnecessarily limiting the amount of these resources that the model can select, the model was forced to select more expensive resources.

C. SP5 and SP6 continue to overly rely on uncertain firm transportation for new CC additions.

Like Duke's initial portfolios, the supplemental portfolios made unreasonable assumptions regarding the availability of additional firm transportation for new CCs. SP5 and SP6 assumed incremental access to Transco Zone 4. (T25, pp 266-67) The Public Staff's suggestion that this capacity would be able to support "up to 2,400 [MW of] CC" does not appear to be a reasonable assumption. (T25, pp 269-70) Public Staff witness Metz testified that he did not know whether Duke has firm supply from Transco Zone 4. (T22, pp 258-59) Neither Duke nor the Public Staff has provided detailed information on how this additional firm capacity would be secured. (T22, p 259) Public Staff witness Thomas acknowledged that without this firm capacity, the model would likely not select additional CCs. (T23, pp 42-43)

D. SP5 and SP6 maintained 35-year useful lives for new natural gas generation units.

Like Duke's initial modeling, the supplemental portfolios utilized a 35-year useful life for new natural gas units. As described in Section IV, this assumption is unreasonable in light of the speculative nature of hydrogen fuel. The Public Staff instead allowed these units to run using the 5% offset allowance in N.C.G.S. § 62-110.9. Duke did not feel that modeling offsets was reasonable because no verifiable offset market exists and "trying to model one would be too speculative and not useful." (T11, pp 22-23)

E. SP5 and SP6 used questionable, out of model steps.

Similar to Duke's initial portfolios, SP5 and SP6 both relied on the "Battery-CT Optimization" step. As discussed below in Section VII, this step, which caused

the replacement of a significant amount of standalone battery storage with new natural gas CTs, was unnecessary and not adequately supported.

VII. The Commission should order Duke Energy to address flaws in its Carbon Plan analysis in its next Carbon Plan filing.

The Carbon Plan filing was Duke's first foray into the use of the EnCompass modeling software for planning purposes. (T10, p 59) Witnesses with more experience using EnCompass testified in this proceeding. (T24, pp 217-18; T25, pp 29-30; T25, p 115) Those witnesses identified a number of problems in Duke's modeling efforts, which are discussed in more detail below. (T25, pp 244-45, 247-49) Combined, these problems likely had a substantial impact on the resources selected in Duke's proposed Carbon Plan and may not have resulted in the least cost mix of resources. (T25, pp 244-45) The Commission should order Duke to resolve these problems prior to its next Carbon Plan filing.

A. Duke's modeling should minimize out of model steps.

Duke's modeling included several steps that occurred outside of the core EnCompass optimization algorithm. (T25, p 257) These types of adjustments can introduce subjectivity, reduce transparency, and may not result in the least cost mix of generation resources. (T25, p 257) AGO witness Burgess identified a number of concerning out of model steps. (T25, pp 258-59) However, the three identified below are the most concerning and warrant explicit direction from the Commission that they should not be repeated in future Carbon Plan modeling.

- i. The endogenously selected retirement dates for coal generating facilities should be used unless there is compelling rationale for delay.

As discussed above in Section III and IV, it is both technically possible and advantageous to ratepayers to retire remaining coal generating units by their endogenously selected retirement dates. In future Carbon Plan proceedings, Duke should be ordered to plan to retire coal units according to their endogenously selected retirement dates unless they provide substantial and compelling evidence that a delay is necessary.

- ii. The Battery-CT Optimization step should not be used.

Between the capacity expansion modeling step and the production cost modeling step, Duke replaced between 1,600 and 2,000 MW of standalone battery storage with between 1,500 and 1,900 MW of natural gas CTs. (T25, pp 258-60) Duke said that this was done because the “typical day” load profile in the production cost modeling step included a steeper transition between the daily peak and minimum system load levels. (T25, p 258) Because of the way batteries operate, Duke believes this tended to overvalue standalone batteries. (T11, pp 116-17)

Duke witness Snider argued that the Battery-CT Optimization was not an out-of-model step. (T10, p 144) However, witness Snider clarified that while the “optimization” was made based on the outputs of the production cost model it was not made by the model itself. (T11, p 118) Instead, Duke employees took the outputs of the production cost model and made a determination whether and to what degree to replace batteries with CTs. (T11, p 118-119)

It is the impact of the step rather than the description that is important: the Battery-CT Optimization step took the objective outputs of the EnCompass production cost modeling and made changes that were imprecise. (T11, pp 120-21) Public Staff witness Thomas testified that “overall cost savings [as a result of this step] are relatively minor and are sensitive to assumptions regarding natural gas prices and battery storage capital costs.” (T21, p 19) Importantly, any cost savings Duke claimed to achieve via the Battery-CT Optimization step are dependent on the CT replacement units not becoming stranded assets in the future. Further, Duke did not use the functionality of EnCompass to allow all resources to compete for the replaced battery capacity, but simply selected CTs as their preferred replacement resource. (Carbon-Free by 2050 Report at 32, T25, 33)

Critically, after the Battery-CT Optimization step, Duke did not run the modified portfolio through the production cost model step. (T10, p 145) Duke felt that such a step was unnecessary. (T10, p 147) However, without re-optimizing the portfolio, it is impossible to determine whether the resulting portfolio is the optimal or least-cost solution. (T25, p 260)

A more precise and transparent way to address the alleged overvaluation of battery resources is to fix the “typical day” load profile in the production cost modeling step to more closely align with real world conditions. (T25, p 260) Duke acknowledged that there were improvements that could be made in this area (T28, p 43) Therefore, in its next Carbon Plan filing Duke should be prohibited from including the Battery-CT Optimization step.

- iii. Duke should allow solar plus storage resources to dispatch flexibly.

In its initial modeling, Duke did not allow solar plus storage resources to dispatch flexibly but required solar plus storage resources to be dispatched according to a fixed profile. (T25, p 100) Doing so led to solar plus storage resources to be devalued. (T25, p 260) Duke acknowledged that this was inappropriate, but was done to conserve modeling resources. (T8, pp 46-47) In the supplemental portfolios, this was corrected and led to substantially more solar plus storage resources being selected. (T25, p 277) The Public Staff stated that this change was “very impactful.” (T23, p 55) However, Duke did not adjust its near-term action plan or re-model in light of this issue and its substantial impact. (T8, pp 48-49; T27, p 269) In future Carbon Plan proceedings, Duke should be required to allow solar plus storage resources to dispatch flexibly in its modeling.

B. Duke’s modeling should remove cumulative constraints on resources.

Duke’s modeling included cumulative limits on a number of resources, including certain solar plus storage and battery configurations. (T11, p 66; T25, p 248) Duke stated that the cumulative limits related to batteries were implemented to reflect the fact that as more batteries are added to the system, their capacity value drops. (T11, p 66) Duke acknowledged that a more reasonable approach would be to utilize declining ELCC values for these resources. (T27, p 111) This was done in the supplemental modeling and lead to additional batteries being selected. (T11, pp 66-67)

Duke also set cumulative limits for onshore wind additions. (T25, p 248) Unlike annual solar interconnection constraints, these cumulative limits do not

necessarily represent technical limitations in the amount that can be added to the system. As described above in Section IV, these limits were not sufficiently supported in Duke's Carbon Plan and were removed from the SP-AGO modeling.

The Commission should direct Duke to remove cumulative limits on specific resources. Instead, Duke should maximize EnCompass' ability to comprehensively evaluate reliability, cost, and performance. To the extent that Duke believes cumulative limits are necessary, they should be evaluated thoroughly and supported by technical analysis. (T25, pp 252-53)

C. Duke's modeling should include additional resource options.

Duke witnesses Snider testified that Duke excluded certain resources from evaluation in order to minimize model run times. (T9, p 64) For example, Duke only modeled two configurations of solar plus storage: one featuring 2-hour batteries assuming a 50% battery ratio and another 4-hour batteries assuming a 25% ratio. (Duke Carbon Plan, Appendix K at 6, T7, p 33; T25, p 253) While Duke's supplemental modeling included an additional configuration, 4-hour batteries with a 50% battery ratios, these three configurations represent a limited set of choices. (Modeling Panel Direct Testimony at 249, T7, p 188; T25, p 253) They also likely do not represent the optimal configurations. AGO witness Burgess testified that solar plus storage configurations with higher battery ratios have a number of benefits, including maximizing interconnection space and providing higher capacity values. (T25, p 253)

Duke also limited the configurations of CCs that the model could select. (T25, p 256) By allowing only larger units to be selected, Duke limited the flexibility

of the model potentially causing more natural gas generation to be added than necessary. (T25, p 256)

Finally, Duke did not allow the model to select conversion of Belews Creek from dual fuel operation to operate entirely on natural gas. (T25, p 276) As discussed above in Section VII, that decision was not sufficiently justified.

The Commission should order Duke to include a broader array of resource options in the 2024 Carbon Plan modeling. Any decision to exclude potential resource options from the Carbon Plan modeling should be explained and supported.

D. Duke's modeling should appropriately reflect the value that solar plus storage provides.

One of the key flaws in Duke's initial Carbon Plan modeling was that solar plus storage resources were forced to dispatch via a fixed dispatch curve rather than being allowed to dispatch flexibly. (T25, p 259) Duke witness Kalemba acknowledged that allowing solar plus storage to dispatch flexibly "would be the appropriate way to model it." (T8, p 47) Witness Kalemba explained that the fixed dispatch was used to "help the modeling time." (T8, p 47) Nevertheless, Duke was able to model the SP5 and SP6 portfolios with a flexible dispatch in the few weeks between July 15, 2022 and August 19, 2022. Duke had over six months to perform modeling from the time this Commission initiated this docket on November 11, 2021 and the filing of its Carbon Plan on May 16, 2022. Duke did not attempt to re-model its original portfolios in order to allow for the flexible dispatch of solar plus storage resources, and made no changes to its near-term execution plan to account for that flaw. (T8, pp 47-49)

E. Duke's modeling should not rely on the use of unproven technologies until there is more information regarding their availability.

Duke's initial Carbon Plan includes large amounts of both SMRs and green hydrogen generation. (Duke Carbon Plan, Chapter 2, Figure 2-4, T7, p 33) Neither of these resources have been deployed at scale anywhere in the world. (Analysis of Duke Energy 2022 Carbon Plan at 36, T25, p 345; Tech Customers - Gabel Report at 4, T25, p 192; Carbon-Free by 2050 at 6, T25, p 33) Nonetheless, Duke counts on SMRs to be able to meet the 70% reduction target by 2034 in Portfolios 3 and 4. (Duke Carbon Plan, Chapter 3 at 10-11, T7, p 33)

Duke's reliance on green hydrogen is particularly concerning. A fundamental aspect of Duke's initial Carbon Plan—relied on in all four of Duke's proposed portfolios—is the eventual conversion of their natural gas generating fleet to operate entirely on hydrogen. (T25, p 271) That reliance impacts Duke's evaluation of how long those units will operate and allows their selection as part of the longer term plan to achieve carbon neutrality. (Duke Carbon Plan, Chapter 3 at 8-11, T7, p 33)

As AGO witness Burgess testified, there are significant questions regarding the potential cost and feasibility of this plan. (T25, pp 271-72) If green hydrogen does not materialize as Duke expects, many of Duke's natural gas generating units would need to retire early or be operated sparingly with carbon offsets. (T10, p 32; T9, p 37)

F. Duke should seek to maximize cost-effective energy efficiency.

Duke selected a demand-side management and energy efficiency (DSM/EE) program target of 1% of eligible retail sales annual. (T25, p 307) Higher

levels of achievement are likely possible, especially in light of the passage of the IRA. (T25, p 308) DSM/EE programs are least cost alternatives to additional supply-side resources. (T25, p 96) Therefore, it is important that in future Carbon Plan proceedings, Duke maximizes the amount of cost effective DSM/EE programs achievable rather than simply selecting a fixed target.

Prior to its next Carbon Plan filing, Duke should be directed to study how varying incentive levels influence DSM/EE impacts and include those as selectable resources in EnCompass. (T25, pp 311-12) Duke argues that this is not reasonable because DSM/EE adoption is “almost entirely dependent on customer preferences.” (Modeling Direct at 124) This ignores the fact that the level or incentives that Duke offers to customers have a direct influence on the amount of DSM/EE that is adopted. (T25, pp 312-13)

VIII. Duke’s request for assurances of cost recovery for initial development activities related to possible offshore wind, SMRs, and pumped hydro projects should not be addressed in this proceeding.

Duke seeks assurances from the Commission about its plans to pursue initial development activities to support the future availability of offshore wind, SMR, and pumped hydro storage projects. Although Duke plans to study multiple potential longer-term resources, only some of which may ultimately be constructed, Duke seeks assurances that the costs of pursuing multiple potential longer term resources will ultimately be recoverable from ratepayers even for projects that are later found to be unnecessary to meet the requirements of House Bill 951.⁶⁹

⁶⁹ Duke petitions for a determination that 1) the initial project development activities taken in advance of receiving a certificate of public convenience and necessity for these resources are “a reasonable and prudent step in executing the Carbon Plan to enable potential future selection” of these long-term resources on the timeline required in HB

Duke's request for assurance of cost recovery should not be addressed in this proceeding for the following reasons.

First, the Commission's review of a decision to pursue development of one or more projects requires the consideration of complex information and documentation supporting the decision and must take into account the potential that the costs will be very high to ratepayers. (T23, p 119-20) The Commission cannot undertake an adequate review in this proceeding, particularly where specific project proposals have not been detailed.

Initially, Duke requested that the Commission approve deferral accounting for these costs.⁷⁰ Public Staff accounting witness Boswell explains that requests for deferral accounting should be considered on a case-by-case basis.⁷¹ (T23, p 119) The factual support for such accounting should "include full and detailed costing, including cost breakdowns between operations and maintenance (O&M) and capital costs, and be subject to the two-prong test of extraordinariness and magnitude, or such other criteria that the Commission considers relevant and important at the time." (T23, p 119) An order allowing the use of special accounting raises issues of fairness for the ratepayers who may be required to pay the

951 goals; 2) to the extent the individual costs are later found by the Commission to be reasonable and prudent, they will be recoverable in rates; and 3) that is so even if the resources are not selected by the Commission and development activities are abandoned in the future. Duke Pre-hearing Comments on Non-Expert Hearing Track Legal and Policy Issues filed in this docket September 9, 2022 at 38.

⁷⁰ Verified Petition for Approval of Carbon Plan at 9.

⁷¹ NCUC Rule R8-27.

deferred amounts in later periods, as well for investors who would benefit from the requested relief.⁷²

Duke has backed off its initial request for Commission authority to “defer” development costs.⁷³ Instead, Duke seeks assurance of cost recovery but does not request approval to defer the costs. Duke indicates it has determined that Commission approval of a deferral is not required, and asserts that costs for long lead-time resources will not be placed in a regulatory asset account “unless otherwise authorized by applicable accounting regulations or future Commission Order to do so.”⁷⁴ Thus, it appears that Duke still seeks assurance of cost recovery, but without the scrutiny that would apply before cost deferral is approved by the Commission. Duke’s request should be denied for the same reasons Ms. Boswell explained that deferral accounting should be considered on a case-by-case basis.

One of the long-term resources for which Duke seeks assurances of cost recovery involves development costs for SMR projects, although Duke has not initiated an application and provided the specifics that are required for approval of deferral accounting for such costs.⁷⁵ Again, Duke’s request should not be

⁷² See *Order Denying Request to Implement Rate Rider and Scheduling Hearing to Consider Request for Creation of Regulatory Asset Account* issued June 2, 2008, In the Matter of Application of Duke Energy Carolinas, LLC, for Approval of Rate Rider to Allow Prompt Recovery of Costs Related to Purchases of Capacity Due to Drought Conditions, Docket No. E-7, Sub 849, (2008 Order) at 21-23; also see *State ex rel. Utils. Comm’n v. Stein*, 375 N.C. 870, 851 S.E.2d 237 (2020) (Holding that, when the Commission exercised discretion to allow extraordinary cost recovery, it acted pursuant to N.C. Gen. Stat. § 62-133(d), and was required to consider all of the material facts of record that would enable it to determine reasonable and just rates, including whether costs should be shared equitably by the utility’s shareholders and ratepayers.).

⁷³ Duke Responsive Comments at 49.

⁷⁴ *Id.*

⁷⁵ Duke Responsive Comments at 39-50.

approved in this proceeding as Duke has not provided adequate basis for the request or specific details about a particular proposal.

The harmful ratepayer impact of Duke's nonspecific request is illustrated by the complexity and high costs associated with DEC's previous recovery of development costs for the Lee nuclear project.⁷⁶ In DEC's general rate case in Docket No. E-7, Sub 1146, the Commission allowed the Lee nuclear project to be cancelled. The final order in that case described extensive Commission proceedings that occurred between 2006 and when the project was abandoned at the end of 2017.⁷⁷ During that period, work on the project was deferred more than once as the need for base load energy was pushed back, but was continued for some time to keep the option available. Ultimately the project was not supported as a least cost resource, and the risks and uncertainties of beginning construction were so great that cancellation was found to be in the best interest of customers.⁷⁸ By the time that the project was finally abandoned, over \$500 million in development costs, including Allowance for Funds Used During Construction (AFUDC), had already been incurred that are still being recovered from ratepayers.

⁷⁹

In this proceeding, Duke's proposal seeks broader assurances than were provided for the Lee project. Duke requests assurances for cost recovery for multiple types of resources (whether or not constructed) without specifics or

⁷⁶ See the extensive discussion in the *Order Accepting Stipulation, Deciding Contested Issues, and Requiring Revenue Reduction* in Docket No. E-7, Sub 1146 et al., issued June 22, 2018, at 150-163.

⁷⁷ *Id.* at 150-163.

⁷⁸ *Id.* at 160.

⁷⁹ *Id.* at 152, 156.

documentation about a particular protect. The Commission should not write a blank check for development of these potential resources. As Public Staff accounting witness Boswell testified,

[P]rospective authorization to recover abandoned plant costs would remove critical checks on the Companies' spending that have historically helped ensure capital expenditures are reasonable and prudent throughout the life of a project. Requests for recovery of abandoned plant should be handled on a case-by-case basis and held to similar historical standards of treatment of abandoned plant.

(T 23 p 124)

Moreover, Duke's request for assurance of cost recovery is inappropriate in this proceeding in that Duke seeks discretionary findings from the Commission that are not consistent with the more limited authority provided by statute. To some extent Duke's request draws from the statutory provision that allows Duke to request such a review for a potential nuclear generating facility. N.C.G.S. § 62-110.7 authorizes the Commission to review the prudence and reasonableness of such a request, and Rule R8-61(h) allows that review upon the filing of an application supported by relevant testimony. However, Duke has not filed an application or testimony pursuant to § 62-110.7 and does not seek authority for a specific project. Duke may seek review of a decision to incur project development costs for a proposed SMR project by following the process set out in the statute and rule. If the application is approved and the specific activities and costs are reasonable and prudent, then the costs may be recoverable even if the project is cancelled. However, it is important for the Commission first to evaluate information and documentation to determine whether the utility has demonstrated the reasonableness and prudence of incurring such costs for a proposed project, as

the costs may be substantial, the need for the project may not materialize, and the burden on ratepayers of such assurances shifts considerable risk from the utility to its ratepayers.

Moreover, while N.C.G.S. § 62-110.7 provides a process for obtaining assurances about the decision to pursue project development of nuclear facilities and to obtain some assurances about cost recovery, that statute does not extend to projects for offshore wind or pumped hydro storage. There is not an analogous statute for offshore wind or pumped hydro storage and the Commission's authority to give such assurances of cost recovery is more circumscribed.

Finally, Duke's request for assurances of cost recovery is inappropriate because it is unlikely all of the long-term projects in Duke's plan will be needed on the timeline that Duke proposes. As is discussed throughout this brief, Duke's modeling assumptions and adjustments contain flaws that distort the results of Duke's proposed plan and do not consider important changes adopted in the Inflation Reduction Act.

IX. The Commission should reject Duke's request that the Commission's Carbon Plan is determinative in a CPCN proceeding.

The AGO does not agree with Duke's position that the Commission's selection of a resource in a Carbon Plan should provide strong evidence of public convenience and necessity and, absent a material change in facts or circumstances, should be determinative.⁸⁰ As just explained, Duke has not provided information about resources evaluated for the Carbon Plan at the level of detail that is needed to show that particular facilities meet the public convenience

⁸⁰ See Duke Responsive Comments at 8.

and necessity as required to obtain a CPCN certificate pursuant to N.C.G.S. § 62-110.1 for the construction of new generating facilities Those requirements have not been modified by provisions in N.C.G.S. § 62-110.9.

Further, all of the plans proposed in this proceeding were developed prior to the enactment of the Inflation Reduction Act, and additional analysis of resource alternatives should be performed and evaluated in light of the material change to key planning assumptions from that federal legislation which are likely to affect resource selections and timing. While near-term procurement of solar, wind, and battery storage will be further cemented as “no regrets” options, the reasonableness of constructing new gas generation (especially CCs) should be reevaluated in the CPCN proceeding. (T25 p 237)

X. In future Carbon Plan proceedings, the Commission should require Duke to conduct additional modeling for the Public Staff and AGO upon request.

On August 17, 2022, the Commission issued an *Order Denying the AGO’s Motion to Direct Duke to Perform Additional Modeling* in the preset, in part due “the compressed timeline for this proceeding.” Yet, Duke witnesses testified to the Commission that intervenor modeling is not—and cannot be—sufficient for planning purposes. (T9, pp 84-86) Witness Snider argued that, due to resource limitations, intervenors “used [EnCompass] in an expedited fashion that allowed for quicker optimizations but sacrificed reliability -- or accuracy of the model.” (T9, p 86) While the AGO disagrees with these assertions, if the Commission agrees with Duke that Duke’s EnCompass modeling is entitled to more weight than the modeling performed for intervenors, then the Commission should direct Duke to conduct additional modeling for the Public Staff and AGO upon request in future

Carbon Plan proceedings where there is not such a compressed timeline. Witness Snider recognized that, as government agencies, the Public Staff and the AGO “may have had legitimate resource limitations” that prevented them from obtaining the “many, many, many servers” necessary to appropriately use the EnCompass model. (T9, p 86)

The Public Staff is authorized and required by law to investigate Duke’s operations under N.C.G.S. § 62-15, and similar authority and duties are vested in the Attorney General under N.C.G.S. § 62-20 and N.C.G.S. § 75-9. While Duke accommodated the Public Staff in this Carbon Plan proceeding, the investigative duties of the Public Staff and the AGO should not be dependent on the voluntary agreement of Duke.

CONCLUSION

For the reasons discussed in this post-hearing brief, the AGO respectfully recommends that the Commission do the following:

1. Hold that N.C.G.S. § 62-110.9 requires the Commission to develop a plan to achieve 70% carbon reduction by 2030, subject to the limited exceptions discussed within these comments;
2. Hold that the ownership provisions in N.C.G.S. § 62-110.9 do not require the Commission to exclude purchased power as a selectable resource for the Carbon Plan;
3. Hold that Duke’s P2, P3, and P4 portfolios as well as the Public Staff’s SP5 and SP6 portfolios fall outside of the Commission’s discretion and

should be given only limited weight as they do not develop a Carbon Plan for achieving the 2030 carbon emission reduction target;

4. Hold that the SP-AGO portfolio represents the least cost path to achieving N.C.G.S. § 62-110.9's carbon reduction targets;
5. Direct Duke to undertake the near-term actions necessary to support the SP-AGO portfolio as described in Section IV herein;
6. Hold that Duke's proposed Carbon Plan relies on problematic modeling assumptions and out-of-model adjustments that impact the resource mix and timing of Duke's portfolios;
7. Decline to consider Duke's request for assurances of cost recovery for initial development activities related to possible offshore wind, small modular reactors, and pumped hydro projects;
8. Clarify that the resource mix and timing selected in the Carbon Plan will be given appropriate weight in subsequent CPCN proceedings, where a more detailed review of particular applications will be conducted, and further analysis of resource alternatives will be required given the material impact of the Inflation Reduction Act on future resource planning.
9. Order that in future Carbon Plan filings, Duke must
 - a. Model Energy Efficiency and Demand-Side Management as a selectable resource;
 - b. Evaluate various incentive levels for residential rooftop solar; and
 - c. Remedy the modeling flaws addressed in this post-hearing brief.

Respectfully submitted this the 24th of October, 2022.

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