STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. E-100, SUB 179

In the Matter of	
Duke Energy Progress, LLC, and Duke	)
Energy Carolinas, LLC, 2022 Biennial	)
Integrated Resource Plans and Carbon	)
Plan	)

TECH CUSTOMERS' POST-HEARING BRIEF

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Apple Inc., Google LLC, and Meta Platforms, Inc. (the "Tech Customers"), through counsel, hereby respectfully submit this Post-Hearing Brief regarding the Carbon Plan filed by Duke Energy Carolinas, LLC ("DEC") and Duke Energy Progress, LLC ("DEP") (together, "the Companies" or "Duke").

I. INTRODUCTION.

This proceeding concerns a dramatic, fundamental change to the way electricity will be generated for the benefit of North Carolina consumers and ratepayers. In HB 951,[1] the General Assembly directed the Commission to "take all reasonable steps" to achieve a 70% reduction in carbon dioxide emissions from energy facilities owned or operated by Duke in the state by 2030, and to achieve carbon neutrality by 2050—all while finding the least cost path to doing so.

This transition is a critical component of the state's efforts to decrease reliance on carbon emitting fuel sources to address emerging climate change and related environmental concerns. The Tech Customers support these efforts, and they each have ambitious climate goals for their own operations which are consistent with the transition away from emissions-based generation.

With this backdrop, the reality is that the transformation of Duke's generation portfolio from carbon-based to distributed, renewable-based fuel sources will have ripple effects across the entirety of the state's power grid. This will require a re-examination of all aspects of the existing ecosystem, including transmission planning, energy efficiency,

[1] N.C. Sess. Law. 2021-165, Section 1 (2021).

customer empowerment, and consideration of greater integration with and participation in external markets. Perpetuation of the status quo is not the path to success.

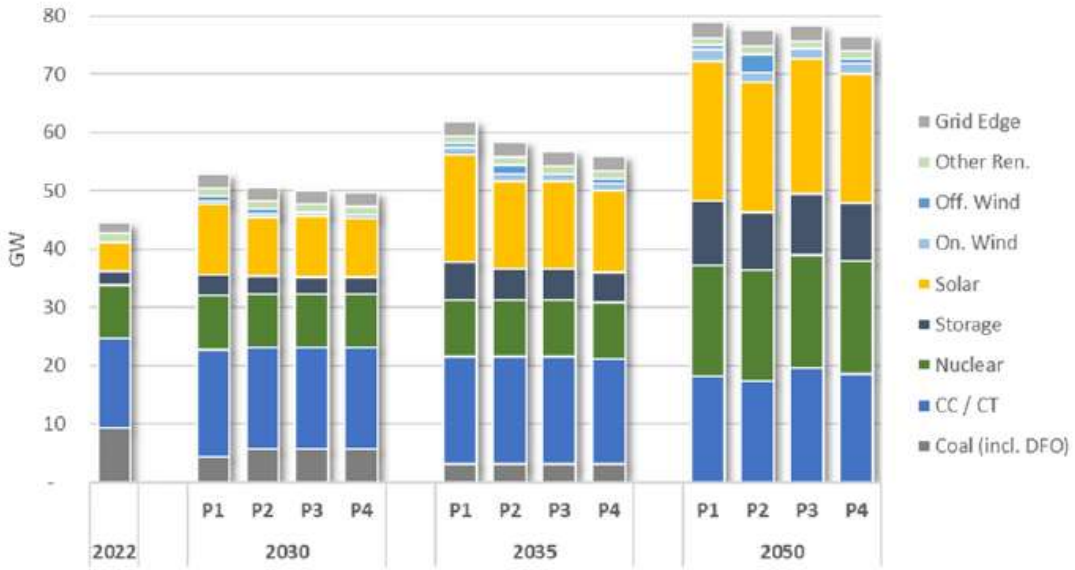
The enormity of the challenge and the high stakes for the people of the State are reflected in the price tag: the cost of achieving the State's carbon reduction goals is estimated at approximately $100 billion (present value) over the next three decades. This first Carbon Plan proceeding will set the stage for the future, and the effects of any missteps here could be magnified down the line.

The Tech Customers have reviewed the Carbon Plan submissions made by the Companies, and have provided comments on Duke's proposed Carbon Plan portfolios and the legal issues in this case. The Tech Customers also sponsored the preparation of a report from Gabel Associates, Inc., (the "Gabel Report"), and the expert witness testimony of Michael Borgatti and Adrian Kimbrough of Gabel Associates and Dr. Maria Roumpani, Ph.D, of Strategen Consulting.

Duke's Carbon Plan presentation is, by all accounts, a robust and serious start to the conversation. Duke deserves credit for the depth and quality of its submission. However, the four principal portfolios[2] resulting from this initial analysis can be fairly criticized as variations on a single theme as illustrated graphically by Figure 3-4 of Duke's plan:

[2] Duke initially modeled four portfolios (P1 – P4), in addition to four alternatives to the basic four ($P1_A$ – $P4_A$) changing only the assumption that firm transportation for Appalachian gas could not be secured. Subsequently, at the request of the Public Staff, Duke modeled two additional portfolios (SP5 and SP6) based on selected input changes from the Public Staff designed to "stress test" the near-term action plan, again with Alternative Fuel options for each portfolio ($SP5_A$ and $SP6_A$).

Figure 3-4: Capacity Mix by Portfolio, Combined Carolinas System (GW basis)



As illustrated by this Figure, Duke's portfolios lack true consideration of divergent pathways to achieving the mandated carbon reductions. The Gabel Report provides the Commission with one of a handful of independent intervenor modeling efforts—and one that offers a true alternative pathway to meeting the State's carbon reduction goals while focusing primarily on actions within Duke's control and avoiding stranded investments.

The parties' submissions and the hearing in this case have, in light of the gravity of the matters in issue, unsurprisingly inundated the Commission with information and varying perspectives. This brief attempts to answer to a handful of crucial questions before the Commission. To that end, this brief covers the following topics:

- The Commission's task as set forth in HB 951, including the legal requirements and standards that bound its actions in this (and subsequent) Carbon Plan proceedings;
- The Tech Customers' specific requests for alterations to Duke's proposed plan; and
- Responses to Duke's requests for near-term action, with the Tech Customers' alternative proposals where appropriate.

II. THE COMMISSION'S TASK UNDER HB 951.

A. The Commission has considerable latitude and discretion in developing and approving a Carbon Plan.

In HB 951, the General Assembly instructed the Commission to:

> [T]ake 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. Gen. Stat. § 62-110.9. To that end, the Commission is required, with input from the utilities and other stakeholders, to "[d]evelop a plan"—the "Carbon Plan"—"to achieve the least cost path . . . to achieve . . . the carbon reduction goals." *Id.* § 62-110.9(1).

HB 951 leaves much of the task of achieving its carbon reduction goals to the discretion of the Commission. In formulating the Carbon Plan, the Commission is authorized to include, "at a minimum," "power generation, transmission and distribution, grid modernization, storage, energy efficiency measures, demand-side management, and the latest technological breakthroughs." *Id.* § 62-110.9(1). Indeed, section 62-110.9(4) explicitly provides that the Commission "[r]etain[s] 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 includes limited discretion to adjust the timing to achieve the 2030 and 2050 carbon reduction goals. *Id.*

However, some aspects of Carbon Plan development are not discretionary. In achieving the carbon reduction goals and determining the generation and resource mix for the future, the Commission must "[c]omply with current law and practice with respect to the least cost planning for generation." *Id.* § 62-110.9(2). The Carbon Plan must be reviewed by the Commission every two years. *Id.* § 62-110.9(1). If the Commission selects "new generation facilities or other resources" to be part of the Carbon Plan, those resources

must be "owned and recovered on a cost of service basis by" the utility, except for energy efficiency and demand-side management (which are subject to existing law) and solar (of which 45% must be third-party owned and 55% utility owned). *Id.* § 62-110.9(2). And, of course, the Carbon Plan must "maintain or improve upon the adequacy and reliability of the existing grid." *Id.* § 62-110.9(3).

B. The Commission's Carbon Plan must be the least cost pathway.

The Commission's objective in this proceeding is to develop a plan that (i) is compliant with current law and practice for least cost planning for generation, and (ii) requires the Companies to pursue the least cost path to achieve the 2030 and 2050 carbon reduction goals. *Id.* § 62-110.9(1) and (2).

The numbers tell the story about why it is critical that the Carbon Plan require the Companies to pursue the least cost path to a carbon neutral electrical grid: by most estimates, the effort is going to cost in excess of $100 billion, which is more than the entire current market cap of Duke Energy Corporation. The cost of the endeavor will be borne by ratepayers.

The need to achieve the least cost path is particularly important because of the uncertainty over who, exactly, is going to pay for the Carbon Plan. While DEC and DEP have historically split the costs of their respective systems among ratepayers living in both North Carolina and South Carolina, there is uncertainty about whether the South Carolina Public Services Commission will allow such cost sharing with respect to Carbon Plan

investments.[3] The uncertainty on this critical issue provides additional inducement to ensure that the Carbon Plan adopted by the Commission is the least cost path.

The Tech Customers have addressed the existing law and practice for least cost planning for generation in their prior comments in this proceeding, and those comments are incorporated herein by reference.[4] The Commission has already acknowledged its responsibility in this proceeding "to ensure that . . . [proposed] facilities meet the least cost mandate,"[5] which mandate encompasses the following principles of existing law and practice:

- North Carolina's statutory policy "require[s] energy planning and fixing of rates in a manner to result in the least cost mix of generation and demand-reduction measures which is achievable." N.C. Gen. Stat. § 62-2(a)(3a).

- The need to consider, prior to approval of any new generation asset, "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." *Id.* § 62-110.1(d).

- The requirement for least cost integrated resource planning to include a forecast of "supply-side (including owned/leased generation capacity and firm purchased power arrangements) and demand-side resources," Rule R8-60(c)(1), where such resources include demand-side management, energy efficiency, purchased power, alternative supply-side resources such as renewable resources, Rule R8-60(d)-(f), and a "comprehensive analysis of all resource options (supply- and demand-side)," Rule R8-60(c)(2).

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[3] *E.g.*, Tr. Vol. 7, pp. 94-95 (Duke witness Bowman); Tr. Vol. 8, pp. 57-60 (Duke witness Snider).

[4] Tech Customers' Comments on Proposed Carbon Plan, Docket No. E-100, Sub 179, at 5-9, 18-23 (July 15, 2022); Tech Customers Comments on Non-Hearing Issues Relating to Duke's Proposed Carbon Plan, Docket No. E-100, Sub 179, at 2-15 (Sept. 9, 2022).

[5] *Order Approving Template Notice and Providing Initial Guidance on Issues Related to CPCN Process and Cost Recovery Under PBR*, Docket No. E-100, Sub 178, at 8 (Sept. 8, 2022).

Thus, the Commission's Carbon Plan must consider all potential supply-side and demand-side resources that can be employed in identifying the least cost pathway to meeting the carbon reduction goals while maintaining grid adequacy and reliability.

However, "reliability" is not a simple metric and there is no "hard and fast" number that must be blindly adhered to. Rather, as the Commission has recognized:

> [I]t is important when applying the principle of long-term least cost planning for generation assets that the Companies avoid near term investments in long-lived generating assets that may, due to market forces and technological change, become economically stranded over the course of the longer planning period. Prudent investments in additional generating capacity in the short term must take this longer-term risk into account, and an absolute insistence on a single fixed and unvarying [reliability metric] does not . . . permit sufficient flexibility to do so.[6]

In other words, in considering the long-term planning exercise required in this proceeding, the Companies should be wary of short-term investments in resources supposedly needed for the sake of reliability (*e.g.*, *immediate* new gas generation) based on an inflexible reliability analysis that could result in stranded assets.

C. Scope of options open to the Commission, including adoption of a "no regrets" strategy.

Although HB 951's directive to achieve the "least cost" pathway is clear, it is equally clear that the General Assembly provided the Commission with significant discretion to determine what the least cost pathway looks like, including the "optimal timing and generation and resource-mix to achieve the least cost path." N.C. Gen. Stat. § 62-110.9(4).

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[6] *Order Accepting Filing of 2019 Update Reports and Accepting 2019 REPS Compliance Plans*, In the Matter of 2019 Integrated Resource Plan Update Reports and 2019 REPS Compliance Plans, Docket No. E-100, Sub 157, at 11 (April 6, 2020).

The Carbon Plan to be developed by the Commission is not simply a list of supply-side and demand-side resources, with power capacities, costs, and on-line dates. Nor is it a computational exercise with determinate, immovable results. Rather, it is a strategy for the state to achieve its carbon reduction goals over the next three decades, taking into account myriad factors and risks, and that includes identification of new resources that are needed as well as existing resources that must continue in use or be phased out. By its nature and the time horizons involved, the Carbon Plan must be composed of appropriate parts of: specific actions to be taken (because those actions will clearly form part of any plan that achieves the carbon reduction goals—such as increased solar generation and the retirement of all coal-fired generation) and an appropriate amount of wait-and-see decisions that leave the door open to low-cost carbon reduction without near-term over-commitment to what may become stranded assets.

In view of these moving parts, Duke has proposed in part,[7] and the Tech Customers support, focusing only on short-term actions to be taken through a "no regrets" basis. Multiple parties to this proceeding are in accord with this approach,[8] including the need to adopt a short-term strategy that (1) enables timely procurement of resources that will be needed to achieve the 2030 carbon reduction goals to ensure those resources to come online by 2030, (2) avoids early commitment of capital to resources that may not ever be needed,

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[7] Duke Energy, *Carolinas Carbon Plan*, Docket No. E-100, Sub 179, Ch. 1 at 8 (May 16, 2022) (hereinafter, "Duke Carbon Plan").

[8] *See, e.g.,* Public Staff Witness Metz Testimony at 39 and 45 (Tr. Vol. 21, pp. 142, 148); AGO Comments filed July 15, 2022 ("least regrets"), at 26 and 27; AGO Witness Burgess Testimony, at 10-12, 67, 69, and 70 (Tr. Vol. 25, pp. 236-38, 293, 295-96); NCSEA *et al*. Joint Comments filed July 15, 2022, at 3, 6, and 20-21; NCSEA, *et al.*, Witness Caspary Testimony, at 8, 10-11, and 23 (Tr. Vol. 22, pp. 232, 234-35, 247); and CPSA Witness Norris Testimony, at 46 (Tr. Vol. 26, p. 64)..

and (3) avoids commitments that will preclude resource options that may later become available as lower-cost options. In this respect, the focus on "no regrets" emphasizes a strategy that preserves going-forward optionality for a diversity of resources that might help achieve the carbon reduction goals while disfavoring actions that have the most risk of not providing long-term benefits to ratepayers. The Tech Customers recommendations herein are consistent with this approach.

D. Intervenor modeling demonstrates the viability of alternative paths.

Various intervenors have offered independent modeling demonstrating the viability of alternative paths to achieve compliance with the carbon reduction goals of HB 951. For example, the Tech Customers' Gabel Report offers an alternative path—the "Preferred Portfolio"—that achieves compliance with the 2030 interim carbon reduction mandate at less cost than Duke's lone compliant portfolio, P1. The principal differences between the Preferred Portfolio and Duke's P1 are:

- The Preferred Portfolio emphasizes new solar-plus storage, additional solar (including a significant ramp-up in behind-the-meter solar), more aggressive energy efficiency savings, onshore wind, and the availability of third party purchase arrangements.
- By contrast, the Preferred does not require new investments in gas, it is not dependent on assumptions of increased gas transportation capacity, it is not reliant on speculative technologies such as hydrogen and SMR or advanced nuclear, and it is not dependent on offshore wind generation capacity.

Tech Customers do not contend that their Preferred Portfolio is the *only* viable path; indeed, given the modeling challenges detailed by their experts, they are confident with

additional time they would have uncovered additional paths to achievement of the carbon goals. The importance of these modeling efforts is to demonstrate that compliance can be achieved, at less cost, following a "no regrets" strategy, by emphasizing strategies and resources within the control of the utility. It is fair to observe that the Preferred Portfolio would require a disruption of the "status quo," particularly as regards Grid Edge activities and investments in storage. But the level of achievement required is consistent with that achieved elsewhere and is consistent with the nature of the task established by HB 951—which requires a transformative approach to Duke's supply-side portfolio.

E. Burden of proof.

In prior comments, the Tech Customers have discussed the burden of proof applicable in this proceeding, and those comments are incorporated herein by reference.[9] In short, no plan or portfolio submitted by any party—including Duke—has a presumption of reasonableness. Rather, all parties, including Duke, have an obligation of persuasion with respect to any evidence or arguments presented to the Commission.

III. THE COMMISSION SHOULD CLARIFY THE PROPER INTERPRETATION OF THE OWNERSHIP PROVISIONS OF HB 951.

A significant legal issue which has arisen in this proceeding is the proper interpretation of N.C. Gen. Stat. § 62-110.9, which provides in pertinent part that:

> [T]he Utilities Commission shall:
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> * * *
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> (2) Comply with current law and practice with respect to the least cost planning for generation, pursuant to G.S. 62-2(a)(3a), in achieving the authorized carbon reduction goals and determining generation and resource mix for the future. Any new generation facilities or

[9] Tech Customers' Comments on Non-Hearing Issues Relating to Duke's Proposed Carbon Plan, Docket No. E-100, Sub 179, at 16-18 (Sept. 9, 2022).

> other resources selected by the Commission in order to achieve the authorized reduction goals for electric public utilities shall be owned and recovered on a cost of service basis by the applicable electric public utility . . . .

The Companies argue that this provision means that any source of electric power[10] used to meet the Carbon Plan requirements must be new generation facilities owned by the Companies. This interpretation has significant implications for application of HB 951 as, for example, Duke's interpretation would require it, as the utility, to own and ratebase any offshore and onshore wind generation facilities selected by the Commission in the Carbon Plan. The Tech Customers have previously demonstrated[11] how Duke's favored interpretation (a) is inconsistent with the "least cost" provisions of HB 951, (b) is inconsistent with the Commission's longstanding interpretation and application of resource planning, (c) conflicts with the Commission's historic consideration of resource need in CPCN proceedings, (d) is inconsistent with Duke's own use of and reliance on purchased power arrangements in its proposed Carbon Plan, and (e) would implicate constitutional concerns.[12] Without replowing this ground, the Tech Customers respond to additional arguments advanced by Duke and the Public Staff on this issue.

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[10] Other than as provided in the exception in N.C. Gen. Stat. § 62-110.9(2)(b) relating to new solar generation, including solar paired with energy storage and procured in connection with any voluntary customer program.

[11] *See* Tech Customers' Comments on Non-Hearing Issues Relating to Duke's Proposed Carbon Plan, Docket No. E-100, Sub 179, at 2-15 (Sept. 9, 2022).

[12] Tech Customers previously pointed out that Duke's interpretation of the ownership restrictions of HB 951 has dormant Commerce Clause risks. A case recently taken up by the U.S. Supreme Court highlights these risks. *See National Pork Producers Council v. Ross*, 6 F.4th 1021 (9th Cir. 2021), *cert. granted*, 142 S. Ct. 1413 (2022). The case concerns pork producers' claims that a California law imposing conditions on pork sold in the state unduly interferes with interstate commerce. The parallels with a state law controlling the provenance of electricity sold in the state are clear. Regardless of how that case turns out, it highlights the fact that using state

By statute, the Carbon Plan is required to include, "at a minimum," "power generation, transmission and distribution, grid modernization, storage, energy efficiency measures, demand-side management, and the latest technological breakthroughs." *Id.* § 62-110.9(1). In keeping with the Commission's practices for least cost planning, the Carbon Plan must include consideration of all resource options, including purchased power. Rule R8-60(d). The Public Staff acknowledges that "PPAs could facilitate lower-cost and lower-risk resource procurement than the construction of utility-owned assets[.]"[13] Duke's failure to fully consider third party purchase arrangements as part of its planning efforts precludes endorsement of its planning effort.

The plain language of HB 951 not only permits *but requires* the Commission to consider the inclusion of purchased power as a resource in the Carbon Plan.[14] Indeed, every single portfolio that has been submitted or suggested to the Commission includes purchased power (other than solar) as one of the resources in its generation mix, whether that means continuation of existing PPAs or the option of new PPAs.

As noted, consideration of "interchange of power, pooling of plant, purchase of power and other methods for providing reliable, efficient, and economical electric service" is required in CPCN proceedings. *Id.* § 62-110.1(d). If the General Assembly truly intended new generation facilities identified in the Carbon Plan to be exempted from comparison to

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law to impose conditions on—or prohibit—interstate electricity sales has the potential to raise dormant Commerce Clause issues that even the U.S. Supreme Court believes are unsettled.

[13] Tr. Vol. 21, p. 78 (Public Staff witness Thomas).

[14] *See* Tech Customers' Comments on Proposed Carbon Plan, Docket No. E-100, Sub 179, 18-23 (July 15, 2022); Tech Customers' Comments on Non-Hearing Issues Relating to Duke's Proposed Carbon Plan, Docket No. E-100, Sub 179, at 2-15 (Sept. 9, 2022).

purchased power options, then section 62-110.1(d) would have been amended. Since purchased power alternatives will still be considered as part of CPCN proceedings, it makes no sense to exclude such consideration from the Carbon Plan. The only substantive objections to the inclusion of purchased power in the Carbon Plan came from the Public Staff[15] and Duke.[16]

The Public Staff agreed that inclusion of PPAs appears to fall within the plain language of HB 951, but indicated concern with the concept of recovering the cost of PPAs on a cost-of-service basis.[17] The Public Staff's objection is based on the premise that the phrase "recovered on a cost of service basis" is synonymous with the phrase "inclusion of the asset in rate base along with a rate of return."[18] This premise is mistaken, as the Commission has conclusively determined in prior decisions. A utility's "cost of service" refers to its "revenue requirement," which is "defined as the sum total of (a) proper operating expenses; (b) depreciation expense; (c) taxes; and (d) a reasonable return on the net valuation of its property."[19] Purchased power costs may be, and historically have been, recovered as operating expenses on a cost of service basis.[20] That is why the Companies'

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[15] Comments of the Public Staff, Docket No. E-100, Sub 179, at 7-11 (Sept. 9, 2022).

[16] Duke Energy Carolinas, LLC and Duke Energy Progress, LLC's Pre-Hearing Comments on Non-Expert Track Legal and Policy Issues, Docket No. E-100, Sub 179 (Sept. 9, 2022).

[17] Comments of the Public Staff, Docket No. E-100, Sub 179, at 11 (Sept. 9, 2022).

[18] *Id.*

[19] *Order Allowing Petition, Establishing Investigation, and Setting Hearing*, Docket No. E-22, Sub 412, at 17 n. 10 (Apr. 23, 2004).

[20] E.g., Order Approving Partial Rate Increase, Docket No. E-22, Sub 314, at 19-22 (Feb. 14, 1991) ("[T]he Commission concludes that there is insufficient justification to treat non-utility generation expense any different from other expense Items in the ratemaking process. . . . Review of the Company's total cost of service in the context of a general rate case is the most effective way to balance these elements."); *see* N.C. Gen. Stat. § 62-133(b)(3), (4) (requiring reasonable

Cost of Service Manuals and cost of service calculations include purchased power costs among the expenses (on which the Companies do not earn a return) that contribute to their respective costs of service.[21] Put simply, power purchases can be, and are, recovered as operating expenses on a cost-of-service basis. This is entirely consistent with the ownership restrictions under HB 951.

Duke claims that HB 951 provides that it "shall own all other Facilities selected by the Commission"[22] (other than the 45% of new solar owned by third parties). But that is not what the law says. Section 62-110.9(2) provides only that Duke shall own "new generation facilities or other resources" selected by the Commission. To be clear, Duke shall own only either (a) "*new* generation *facilities*" or (b) "other *resources*."

If the Commission chooses an *existing* generation *facility* (*e.g.*, a solar plant) as part of the Carbon Plan, there is no ownership requirement. This makes eminent sense; a significant portion of the carbon-free generation already on Duke's system is third-party owned solar generation. Duke's portfolios rely on this existing solar generation;[23] no party or witness in this proceeding has suggested that the Commission is required to proceed as if none of the existing third-party solar generation can be part of the Carbon Plan unless Duke purchases every solar generation facility.

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operating expenses to be determined and recovered in rates in addition to the rate of return fixed by the Commission).

[21] *E.g.*, Duke Energy Carolinas, LLC's Annual Cost of Service Studies and Cost of Service Manual Docket No. E-7, Sub 1214 (May 24, 2022); Duke Energy Progress, LLC Cost of Service Studies and Cost of Service Manual Docket No. E-2, Sub 1219.

[22] Duke Energy Carolinas, LLC and Duke Energy Progress, LLC's Pre-Hearing Comments on Non-Expert Track Legal and Policy Issues, Docket No. E-100, Sub 179, at 19 (Sept. 9, 2022).

[23] *See, e.g.,* Duke Carbon Plan, App. I p. 5, Fig. I-1.

Similarly, if the Commission chooses a "resource" (such as purchased power, which is not a new generation facility but rather contractual ownership of the power produced by a facility owned by a third party), then Duke is required to own the "resource" (such as the power purchased, which by contractual law Duke will own) *but not the facility that produced the resource*.[24] Again, it bears repeating that Duke's proposed portfolios already include and significantly rely upon power purchases. Under Duke's proposed interpretation, the Carbon Plan could not include any purchased power, and Duke would be required to terminate all of its PPAs, and would be prohibited from all such purchases in the future. The General Assembly certainly could not have intended such a radical departure from existing law, particularly given that the law continues to explicitly require the consideration of purchased power as an alternative power option in CPCN proceedings.

Duke suggests that the specific requirement for third-party ownership of 45% of the new solar facilities that are part of the Carbon Plan shows that power purchases from third parties are not otherwise authorized.[25] On the contrary, subsection 2(b) stands for what it says, nothing more and nothing less: that solar generation is excepted from the requirement for utility ownership for *new generation facilities*.

Tellingly, Duke's comments do not dispute that power purchases are a "resource" or that Duke *would* own any purchased power. There is no conflict in section 62-110.9(2), despite Duke's attempts to create one. Duke must own any new generation—if such

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[24] It is also worth noting that it is not unusual to refer to a party as "owning" a contract. *E.g.*, *Boyce Hydro Power, LLC*, 167 FERC ¶ 61,248, 62,318 (2019) ("Boyce Hydro would continue to own the power purchase agreement . . . for the Edenville Project.").

[25] Duke Energy Carolinas, LLC and Duke Energy Progress, LLC's Pre-Hearing Comments on Non-Expert Track Legal and Policy Issues, Docket No. E-100, Sub 179, at 24 (Sept. 9, 2022).

generation is selected by the Commission—and it must own other resources (like PPAs) if those resources are selected by the Commission.

IV. THE TECH CUSTOMERS' RECOMMENDATIONS FOR THE INITIAL CARBON PLAN.

In light of the foregoing discussion, and in consideration of the record as a whole, the Tech Customers make the following recommendations for approval of the inaugural Carbon Plan.

A. Approve only near-term actions on a "no regrets" basis.

The Tech Customers agree with the Companies that the discretion delegated to the Commission in HB 951 supports a conclusion that the initial Carbon Plan adopted in this proceeding does not need to be a specific portfolio of generation assets and on-line dates.

Section 62-110.9(4) explicitly provides that the Commission "[r]etain[s] discretion to determine optimal timing and generation and resource-mix to achieve the least cost path to compliance with the authorized carbon reduction goals." Section 62-110.9(1) directs the Commission to review the Carbon Plan every two years, and allows the Commission to "adjust [the plan] as necessary." Taken together, these provisions indicate that General Assembly's intention and expectation that the Carbon Plan will be a "living" plan for achieving the carbon reduction goals. Accordingly, the Commission should not feel constrained to select a particular portfolio of assets in this proceeding.

Rather, the Commission should take this inaugural Carbon Plan as an opportunity to identify actions that are necessary in the near-term—i.e., actions to be taken between now and the next biennial update—that will position the Companies to achieve the least cost path to the carbon reduction goals. In practice, what this means is that the Commission

should be looking for near-term, "no regrets" actions that keep open the potential to pursue multiple cost-competitive paths to a carbon-free grid, with due consideration given to the risks inherent in different generation technologies.

The need to maintain flexibility at this early stage is critical given some key uncertainties in various inputs driving supply side decisions. Among these uncertainties are: when offshore wind generation will become available; whether small modular nuclear reactors will become available; whether a hydrogen market will develop and be feasible for commercial-scale deployment; whether additional natural gas supply will become available to power new gas generation; whether Duke will be able to meet or exceed the pace of solar interconnections projected by the various portfolios; and to what extent the Inflation Reduction Act of 2022 ("IRA") will reduce the costs of various renewable generation technologies compared to traditional generation technologies. During this initial Carbon Plan proceeding, the Commission should refrain from making commitments to resources that could be negatively impacted by these uncertainties.

B. The Commission should require the Companies to model the availability of purchased power in future planning exercises.

As discussed above in Section III, the Carbon Plan is required to include, "at a minimum," "power generation, transmission and distribution, grid modernization, storage, energy efficiency measures, demand-side management, and the latest technological breakthroughs." *Id.* § 62-110.9(1). In keeping with the Commission's practices for least cost planning, the Carbon Plan must include consideration of all resource options, including purchased power. N.C.U.C. Rule R8-60(d). The Public Staff, despite its concern with the interpretation of the statutory language, acknowledges that "PPAs could facilitate lower-cost and lower-risk resource procurement than the construction of utility-owned

assets[.]"[26] And, on cross-examination Duke's witness Snider acknowledged that PPA costs are recovered on a "pass through" basis whereas Duke-owned assets are recovered in rate base and subject to approved return for shareholders.[27] Duke's failure to fully consider third-party purchase arrangements as part of its planning efforts precludes endorsement of its planning effort.

As recognized by intervenors, including the Attorney General and NCSEA *et al.*, the plain language of HB 951 not only permits *but requires* the Commission to consider the inclusion of purchased power as a resource in the Carbon Plan.[28] Indeed, every portfolio that has been submitted or suggested to the Commission includes purchased power (other than solar) as one of the resources in its generation mix, whether that means continuation of existing PPAs or the option of new PPAs. Yet Duke excluded the availability of purchased power as a resource option in its plan due to its interpretation of the ownership language in HB 951.

The Commission should require Duke to model the availability of purchased power in future resource planning exercises, including the next IRP and Carbon Plan updates.

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[26] Tr. Vol. 21, p. 78 (Public Staff witness Thomas). However, the Public Staff incorrectly believes HB 951 forecloses the consideration of PPAs. *See id.*

[27] Tr. Vol. 12, pp. 49-50 (Duke witness Snider).

[28] *See, e.g.,* AGO Responsive Comments, Docket No. E-100, Sub 179, at 11-13 (Sept. 9, 2022); NCSEA, *et al.*, Joint Responsive Comments, Docket No. E-100, Sub 79, at 8-10 (Sept. 9, 2022); Tech Customers' Comments on Proposed Carbon Plan, Docket No. E-100, Sub 179, 18-23 (July 15, 2022); Tech Customers Comments on Non-Hearing Issues Relating to Duke's Proposed Carbon Plan, Docket No. E-100, Sub 179, at 2-15 (Sept. 9, 2022).

C. Require full evaluation of the IRA.

Enacted on August 16, 2022, the IRA provides incentives for low-carbon and carbon-free generation. However, due to the timing of its passage, the still-developing nature of its implementing regulations, and the time constraints of this proceeding, its impacts were not fully modeled by any of the parties. Nevertheless, Duke's preliminary analysis shows that the IRA has the potential to impact near-term investment in solar and natural gas generation—increasing the pace of solar development while avoiding construction of some new gas-fired generation in the near-term.[29]

The IRA has been called "the most significant climate legislation in United States history."[30] Duke acknowledges that the IRA will make renewable generation assets more cost competitive.[31] In fact, Duke's preliminary IRA analysis resulted in the elimination of 1,200 MW of combined cycles and 1,100 MW of combustion turbines that were otherwise selected by Duke before 2030—with these gas resources being economically replaced by renewable resources.[32] Given that Duke's proposed Carbon Plan does not consider the impacts of this new law, the Commission should be reluctant to make any near-term

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[29] Duke's Late Filed Exhibit No. 1.

[30] Implementing the Inflation Reduction Act: A Roadmap for State Electricity Policy, Energy Innovation Policy & Technology, LLC, October 2022 (available at https://energyinnovation.org/wp-content/uploads/2022/10/Implementing-the-Inflation-Reduction-Act-A-Roadmap-For-State-Policy.pdf).

[31] Tr. Vol. 27, p. 72 (Duke witness Snider).

[32] *Compare* Duke's Late Filed Exhibit No. 1, Table IRA-3 and IRA-4 (showing 1,216 MW of CCs selected by 2029 and 703 MW of CTs selected by 2028), *with* Duke Carbon Plan, Ch. 3, Table 3-3 (showing 2,430 MWs of CCs and 1,128 MW of CTs selected by 2030); *see also* Tr. Vol. 27, pp. 193-94 (Duke witness Snider testifying that 703 MW was forced in as part of the CT-Battery Optimization step).

selections of resources that could be negatively impacted by the implementation of the IRA—namely, natural gas generation assets.[33]

At a minimum, should the Commission wish to proceed in the absence of consideration of IRA impacts here, Duke should be required to model the impacts of IRA in future resource planning exercises, including the next IRP and Carbon Plan updates.

D. Require evaluation of market participation.

Consistent with the emphasis of the General Assembly on adoption of a "least cost" plan, there are benefits of an independent system operator ("ISO") or a regional transmission operator ("RTO") that could be relevant to the Carbon Plan, such as the removal of charges for the importation of out-of-state renewable energy and access to cheaper and more reliable sources of renewable energy.[34] Multiple intervenors in this proceeding acknowledge the potential benefits of organized market participation and the symmetry between the goals of this proceeding and benefits of markets and inter-regional cooperation and/or centralized planning.[35] In view of the magnitude of the task before the

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[33] *See* NCSEA, *et al.*, Witness Varadarajan Testimony, at 10-20 (extended analysis of IRA and noting, in particular, comparatively negative impact on portfolios that rely on new gas generation or continuation of coal generation past economically optimal retirement dates); AGO Witness Burgess Testimony, at 15-18 ("To put it bluntly, the previous analysis was performed using assumptions that are now obsolete and do not reflect the current reality.").

[34] Tr. Vol. 25, p. 66 (Tech Customers witness Borgatti).

[35] *See* Walmart Comments, Docket No. E-100, Sub 179, at 12-14 (July 15, 2022); CCEBA Comments, Docket No. E-100, Sub 179, at 8-9 (July 15, 2022) (discussing benefits of inter-regional planning and stating that the "Commission should encourage Duke to join a RTO or ISO in the event Duke demonstrates that it cannot be reliably expected to plan transmission with the goal in mind of meeting regional needs cost-effectively."); CPSA Brattle Report (Exhibit E to CPSA Comments filed July 15, 2022), *passim* (discussing benefits of inter-regional planning); Appalachian Voices Comments, Docket No. E-100, Sub 179, at 24 (July 15, 2022) ("[R]ecent independent analyses of decarbonizing through a Southeast RTO, indicate that such an approach could save ratepayers hundreds of billions of dollars region-wide by 2040 compared to a business-as-usual case.").

Companies and the move away from large, centralized power generation units in Duke's plan, the Commission should direct Duke to review the potential of joining or forming a regional entity for achieving the Carbon Reduction goals at a lower cost.

This is a transformative proceeding; all options must be on the table for consideration, particularly solutions which have been demonstrated to work, which will lead to ratepayer savings, and which will facilitate the transition to a carbon neutral generation portfolio. The South Carolina Public Service Commission is currently examining market options[36] and, of course, Duke is proposing greater integration of its bi-state operations and is proposing in this proceeding a regional "Carolinas" Carbon Plan.

Energy markets create numerous potential benefits of relevance here. First, RTOs often compel participants to purchase cheaper wholesale energy during peak demand rather than producing it themselves, which allows for further savings and reductions in reserve margins.[37] Second, because of the ways RTOs are operated, RTOs allow for joint transmission planning and the reduction of transmission congestion.[38] Third, RTOs have even greater ability to deploy renewables because RTOs automatically dispatch the lowest-cost resources (which are often wind and solar generation) and integrate the variability of

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[36] *See* Act No. 187 of 2020 Session of South Carolina Legislature (H.B. 4940).

[37] *See* Duke Nicholas Institute, *Evaluating Options for Enhancing Wholesale Competition and Implications for the Southeastern United States* (Mar. 2020), at 3, available at https://nicholasinstitute.duke.edu/sites/default/files/publications/Evaluating%20Options%20for%20Enhancing-Wholesale-Competition-and-Implications-for-the-Southeastern-United-States-Final.pdf [hereinafter "*Evaluating Options for Enhancing Wholesale Competition*"]; Energy Transition Institute, *An Energy Imbalance Market in the Southeastern United States* (Sept. 2020), at 7 [hereinafter "*An Energy Imbalance Market*"].

[38] *An Energy Imbalance Market,* at 8; *Evaluating Options for Enhancing Wholesale Competition*, at 14.

renewables over a more diverse load.[39] In addition, an RTO's ability to balance supply and demand over a larger footprint—and the resulting diversity of capacity and load—reduces the need for participants to curtail the intermittent generation of renewables.[40] This diversity, when coupled with advancements in demand-side-management and energy-efficiency programs, should provide more supply-demand flexibility to help boost the integration of renewables and mitigate against the risk of shortfalls in supply.

It has been well documented that RTOs can produce efficiencies that result in massive cost savings for participants. Studies have forecasted that a Southeastern RTO could provide cumulative cost savings of up to $384 billion by 2040, with *annual* savings for DEC's and DEP's North Carolina customers ranging from $411 million to $593 million.[41] Indeed, the Commission has concluded that Dominion North Carolina Power's participation in PJM has benefited ratepayers.[42]

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[39] *An Energy Imbalance Market,* at 7; *Evaluating Options for Enhancing Wholesale Competition*, at 10.

[40] *Evaluating Options for Enhancing Wholesale Competition*, at 3, 17.

[41] Vibrant Clean Energy, *Summary Report: Economic and Clean Energy Benefits of Establishing a Southeast U.S. Competitive Wholesale Electricity Market* (Aug. 2020), at 1 (discussing Southeastern RTO), available at https://energyinnovation.org/wp-content/uploads/2020/08/Economic-And-Clean-Energy-Benefits-Of-Establishing-A-Southeast-U.S.-Competitive-Wholesale-Electricity-Market_FINAL.pdf; The Brattle Group, *Potential Benefits of a Regional Wholesale Power Market to North Carolina's Electricity Customers* (Feb. 2019), at 8 (Table 3 shows NC cost savings), available at https://brattlefiles.blob.core.windows.net/files/16092_nc_wholesale_power_market_whitepaper_april_2019_final.pdf; *see also An Energy Imbalance Market,* at 16; *Evaluating Options for Enhancing Wholesale Competition*, at 9.

[42] *Order Approving Rate Increase and Cost Deferrals and Revising PJM Regulatory Conditions*, Docket No. E-22, Sub 532 (Dec. 12, 2016), at 144.

Notwithstanding these benefits, and the ongoing study in South Carolina, Duke apparently has not modeled the benefits associated with market participation.[43] The Commission should conduct an inquiry into the potential impacts of market participation as an essential component of this carbon reduction initiative.

E. Implement transmission planning reform.

All parties acknowledge that the limitations of the existing transmission system are a significant bottleneck—and potentially a roadblock—to the timely integration of renewable energy resources, particularly distributed resources, onto the grid. Indeed considerable attention has been given to certain "red zone" upgrades proposed by Duke which would target specific projects for infrastructure upgrades.

However, less attention has been focused on necessary reforms to the transmission planning process that might have avoided the red zone issue or lessened its impact. At present, the system is characterized by a significant asymmetry in information about the capabilities and capacities of the existing grid, which has led to inefficient deployment of distributed energy resources. Given the statutory imperatives of HB 951, this planning process should be reformed.

Various intervenors have proposed reforms which are worth investigation and consideration.[44] In its report on behalf of the Tech Customers, Gabel Associates identifies

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[43] *See* Tech Customers Comments, Docket No. E-100, Sub 179, at Exhibit A (Duke Response to Tech Customers DR 2-4 (July 15, 2022) (responding to question as to whether Duke has modeled potential customer savings by joining PJM or participating in and RTO by referring to Duke Carbon Plan App. B, p. 13); *accord* Walmart Comments, Docket No. E-100, Sub 179, 2022, at Exhibits (July 15, 2022).

[44] *See, e.g.,* NCSEA, *et al.*, Witness Caspary Testimony, at *passim* (Tr. Vol. 22, pp. 223-53); AGO Witness Burgess Testimony, at 81-82 (Tr. Vol. 25, pp. 307-08); CCEBA and MAREC

this issue and makes several specific reforms. First, Duke should use Generator Replacement Requests to "recycle existing interconnection facilities" by placing new generation on the site of decommissioned generation.[45] Second, Duke should use Surplus Interconnection Service as an additional method to mitigate against transmission challenges.[46] Gabel explained that the Surplus Interconnection Service occurs "outside the conventional [intermission] queue process" and takes "about 255 days to complete," connecting additional renewable resources without requiring the time and investment of traditional interconnection processes.[47] Consistent with this recommendation, the Public Staff "encourage[d] Duke to carefully evaluate generator replacements."[48] The Public Staff also acknowledged that using Surplus Interconnection Service to match solar with a CT would allow the solar facility to take advantage of existing transmission capacity when the CT is not operating,[49] and recommended that "Duke should address whether there are cost savings that could be achieved via the Surplus Interconnection process."[50]

Finally, Gabel recommended that Duke "develop a coordinated, portfolio-based transmission plan with the NCTPC."[51] This last request should be especially uncontroversial as Duke itself asked that the Companies be directed "to continue to study

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Action Witness Gonatas Testimony, at *passim* (Tr. Vol. 22, pp. 118-51); and CUCA Witness O'Donnell Testimony, at 12-14 (Tr. Vol. 25, pp. 209-14).

[45] Gabel Report at 5; Tr. Vol. 25, p. 66 (Tech Customers witness Borgatti).

[46] Gabel Report at 34; Tr. Vol. 25, p. 68 (Tech Customers witness Borgatti).

[47] Gabel Report at 34; Tr. Vol. 25, p. 126-28 (Tech Customers witness Borgatti).

[48] Tr. Vol. 21, p. 152 (Public Staff witness Metz).

[49] Tr. Vol. 21, p. 153 (Public Staff witness Metz).

[50] Tr. Vol. 21, p. 153 (Public Staff witness Metz).

[51] Gabel Report at 17; Tr. Vol. 25, p. 67 (Tech Customers witness Borgatti).

future transmission needs to reliably implement the Carbon Plan through the NCTPC and other appropriate forums."[52]

The Commission should initiate a process to ensure the implementation of meaningful reforms that would facilitate the timely and least cost integration for distributed energy resources onto the grid.

F. Deny immediate action on new gas.

The Commission should defer any decision on Duke's request for selection of new CT and CC generation until the 2024 Carbon Plan proceeding. The various modeling results indicate that, at the earliest, new gas generation might be needed in the late 2020s, but this modeling does not take into account the impact of IRA on relative resource costs, it assumes that new gas will be available, and not all modeling demonstrates this need.[53]

Notably, Duke had the earliest selection of new gas units, seeking the addition of 800 MW of CTs by the end of 2027 and 1,200 MW of CCs by the end of 2028.[54] However, the assumptions and modeling constraints utilized by Duke concerning gas were heavily criticized by intervenor expert testimony,[55] which criticisms were not rebutted by Duke at the hearing.

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[52] Petition, Request for Relief No. 5.

[53] *E.g.*, Gabel Report pp. 10-11; Brattle Report pp. 29-34 (new gas selected in 2029); Synapse Report p. 3 (no new gas selected); Modeling and Near-Term Actions Panel Exhibit 1 pp. 15-22 (new gas selected by 2028); Duke Carbon Plan Table 4-5.

[54] Duke Carbon Plan, Ch. 4 at 14.

[55] *See, e.g.,* Tech Customers Witness Roumpani Testimony, at 15 (Tr. Vol. 25, p. 98) (Duke's user-imposed constraints employed in EnCompass "are so restrictive that they overly narrow the portfolio selection to a single choice: the addition of new gas generation."); Tech Customers Witness Kimbrough Testimony, at 3-14 (Tr. Vol. 25, pp. 72-83) (criticizing Duke's capital cost assumptions); NCSEA, *et al.*, Witness Fitch Testimony, at 17-23 (Tr. Vol. 24, pp. 144-50); AGO Witness Burgess Testimony, at 38-44 (Tr. Vol. 25, pp. 264-270).

Even accepting, for purposes of discussion, Duke's questionable modeling and assumptions, Duke's insistence that the Commission endorse its "aggressive development timeline" for new gas resources is not supported by the evidence.[56] As explored during the hearing, Duke's proposed construction timeline for these assets is not "aggressive." Indeed, Duke assumes it will take up to four years to build the CT units and 5 years to build the CC units,[57] whereas industry benchmarks for such construction timelines range from 20–24 months and 32–36 months, respectively.[58] Duke did not provide any substantive justification for why its construction timelines are almost *twice as long* as the industry benchmarks. Notably, Duke admitted that the new gas plants will be built on brownfield sites, which can expedite the construction of a new CT or CC facility.[59]

As demonstrated below in Tech Customers Modeling Panel Cross Exhibit 3, if the Companies could construct these new gas units within the range of time expected by industry benchmarks, the Companies would not need CPCNs until 2025 and would still be able to have the units operational by the years identified in their modeling.

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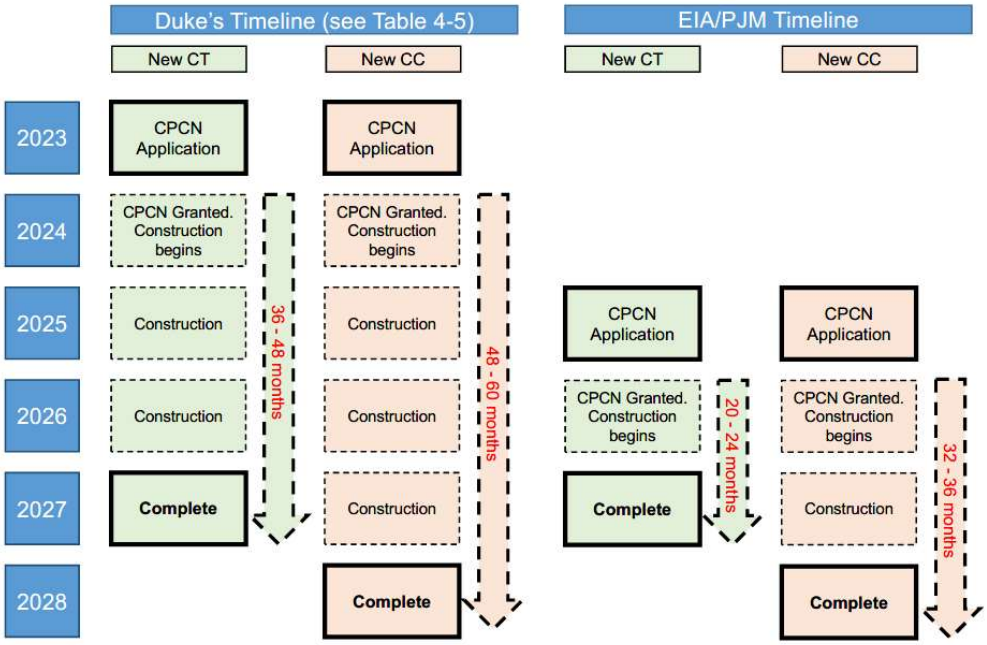
[56] *Id.*

[57] Duke Carbon Plan, Ch. 4, pp. 14-15.

[58] Tech Customers Modeling Panel Cross Exhibits 1 & 2; Tr. Vol. 10, pp. 116-18 (Duke witness Snider).

[59] *E.g.*, Tr. Vol. 10, pp. 125-26.



The benefits of delaying a decision on new gas plants until 2024 were well established in the hearing. Duke (and the Public Staff) could not tell the Commission from where the Companies would secure fuel to supply these new gas plants. Duke admitted that it is already short on gas transportation capacity, and it does not yet have a concrete plan to solve this huge problem.

To be clear, Duke already lacks sufficient firm capacity to fuel its existing gas fleet.[60] The depth of Duke's supply shortfall is concerning: "*less than half* of its current combined-cycle design capacity" has firm gas supply, and "*less than a quarter* of the current gas fleet's historical peak gas burn" can be satisfied by firm gas supply.[61] Simply

[60] Duke Carbon Plan, App. N at 7 ("[T]he Companies' combined cycle fleet is currently deficient of interstate pipeline firm transportation capacity due to the cancellation of Atlantic Coast Pipeline ("ACP").").

[61] Duke Carbon Plan, App. N at 9 (emphasis added).

put, although Duke can buy gas for its current fleet, it has no guaranteed pathway for transporting that gas to the plants that need it.[62] Duke attempted to reassure the Commission that it would be able to supply its gas fleet by purchasing transportation rights at "exorbitant" spot delivery prices[63]—which is *not a guarantee* of gas supply and not comforting in light of the punishing bill increase ratepayers have already experienced because of gas volatility.[64]

Duke's hope for securing more fuel transportation for its gas fleet rests on the efforts of third parties. First and foremost, Duke assumes that the Mountain Valley Pipeline ("MVP") will be completed in the second half of 2023.[65] Duke's assumption does not account for the fact that MVP is subject to five different federal lawsuits challenging its permitting.[66] Indeed, this summer, MVP asked for and received a four-year extension to its construction timeline.[67] As a backup to MVP, Duke is hoping that Transco would be willing and able to construct upgrades to increase the existing pipeline's capacity.[68] Duke provided vague descriptions about these potential upgrades and admitted that it had not yet taken any steps in furtherance of this project which, based on post-hearing events, may be in jeopardy.[69]

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[62] *E.g.*, Tr. Vol. 21, p. 74 (Public Staff witness Thomas).

[63] Tr. Vol. 27, p. 181 (Duke witness Snider).

[64] Order Approving Fuel Charge Adjustment, Docket No. E-7, Sub 1263, at 8-11 (Aug. 16, 2022).

[65] Tr. Vol. 7, pp. 370-71 (Duke witness Snider).

[66] Tr. Vol. 27, pp. 186-87 (Duke witness Snider).

[67] Tr. Vol. 27, p. 188 (Duke witness Snider).

[68] Tr. Vol. 27, p. 220 (Duke witness Snider).

[69] Tr. Vol. 27, pp. 220-21, 225-26 (Duke witnesses Snider and Quinto). *See* Mountain Valley Pipeline, LLC, Notice of Voluntary Dismissal, Civil Action No. 1:21-cv-47-TDS-JLW (M.D.N.C. filed Oct. 20, 2022) (available at

In addition, as has been repeatedly noted in this proceeding, new gas assets risk being stranded assets given future restraints on carbon emissions and the uncertain availability of hydrogen fuel in the future.[70] The risk of gas plants becoming stranded assets only increases with the introduction of the IRA and the legislation's financial incentives for renewable resources—which will make the economics of natural gas even less attractive in the future.[71]

The selection of 800 MWs of CTs and 1,200 MWs of CCs as part of this Carbon Plan comes with significant risks. Importantly, these risks can be mitigated—or even avoided—by delaying the consideration of new gas assets until the 2024 Carbon Plan proceeding. As demonstrated by the modeling of both Tech Customers and NCSEA, *et al*., gas plants are not necessarily required to meet reliability needs. And even if the Commission were to accept Duke's modeling of gas plants, Duke has not justified the need to commit to those resources during this Carbon Plan proceeding. Given the uncertainty over gas generation in the short- and long-term, and the fact that deferring a decision on new gas appears to be the "no regrets" choice, the Commission should reconsider new gas during the next Carbon Plan proceeding.

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https://www.scribd.com/document/601991382/Dismissal-Wo-Prejudice-102022) (dismissing eminent domain proceedings involving 69 parcels of real estate in Alamance and Rockingham Counties in connection with Southgate project).

[70] *See* Gabel Report at 10, 55; Tr. Vol. 21, pp. 69-70 (Public Staff witness Thomas); Tr. Vol. 24, pp. 158-59 (NCSEA, *et al.*, witness Fitch); Tr. Vol. 24, pp. 271-72 (AGO witness Burgess).

[71] *See* NCSEA, *et al.*, Witness Varadarajan Testimony, at 10-20 (Tr. Vol. 23, pp. 240-50) (noting, in particular, comparatively negative impact of IRA on portfolios that rely on new gas generation or continuation of coal generation past economically optimal retirement dates); AGO Witness Burgess Testimony, at 17 (Tr. Vol. 25, p. 243) (consideration of IRA "would likely decrease the economic selection of 6 natural gas due to reduced competitiveness.").

G. Deny immediate action on offshore wind.

Although the Tech Customers generally support offshore wind technology, the Tech Customers believe Duke's request for Commission approval of unspecified, unconstrained, and unbudgeted development activities in offshore wind is premature and unnecessary.

Offshore wind was not selected by Duke's Supplemental Portfolios until the 2040s.[72] Despite the delayed selection of offshore wind, Duke persisted that the Supplemental Portfolios "support [Duke's] request for approval of near-term development activities for . . . offshore wind."[73] That is clearly not the case since it takes a decade to build an offshore wind facility,[74] which means that if Duke were to start development activities in 2030—eight years from now—Duke would have sufficient time to construct offshore wind before it would need to be operational in the 2040s.

Moreover, ratepayers should not foot the bill for the development by Duke's unregulated affiliated of the Carolina Long Bay lease—particularly given that Duke has not made any showing of the total costs associated with utility development and ownership of the facility and whether it is least cost. The Commission, to date, has not been presented with any evidence which would be sufficient to inform a decision about the prudence of such expenditures. Further, Duke testified that its affiliate, which owns the lease, has already begun working on the Site Assessment Plan in the absence of Commission

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[72] Tr. Vol. 7, p. 261 (Duke witness Snider).
[73] Tr. Vol. 7, p. 268 (Duke witness Snider).
[74] Duke Carbon Plan App. J at 7 ("Development of offshore wind resources have a long lead time, approximately a decade from leasing a WEA to commercial operation.")

approval.[75] Thus, Duke's affiliate has already made decisions on its own accord, and the evidence does not support a finding that the Companies must own the lease in order to incentivize the continued development of the offshore site or the economic consequences of ownership. Further, Duke's affiliate could also conduct a Survey Plan and develop a Construction and Operation Plan—and do so without having to burden ratepayers now with $300 million in development costs.[76]

The Public Staff recommended that "the Commission deny Duke's request to begin near-term resource development activities for offshore wind."[77] Tech Customers agree and fully support the Public Staff's recommendation for the current proceeding and also join the Public Staff's recommendation that Duke reevaluate the need for offshore wind resources in the 2024 Carbon Plan.[78]

Tech Customers request that the Commission order an independent, third-party study be undertaken to evaluate the three available offshore wind lease areas located off the coast of North Carolina. Such a study should be open to stakeholder input and be available prior to the 2024 Carbon Plan so as to better inform the Commission of the full range of possibilities for offshore wind.

H. Adopt more robust customer programs, including programs targeted to commercial and industrial customers.

The Commission should direct Duke to develop and propose new program offerings, in consultation with stakeholders, that would unlock commercial and industrial

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[75] Tr. Vol. 17, p. 110 (Duke witness Pompee) ("Duke Energy Renewables Wind, LLC is currently working on the SAP, which is targeted for completion by mid-2023[.]").

[76] Tr. Vol. 17, pp. 117, 133 (Duke witness Pompee).

[77] Tr. Vol. 21, p. 127 (Public Staff witness Metz).

[78] Tr. Vol. 21, p. 127 (Public Staff witness Metz).

customer activity to contract with new renewable energy projects in North Carolina or any other state where the participating customer can arrange transmission into the applicable Duke service territory. These offerings would have the customer contract for and pay the power supply cost of a new renewable project. This contract purchase would be coupled with a requirement that the customer pays for delivery service through the Duke system at rates set by the Commission and embedded in Duke's tariff.

Various stakeholders have emphasized the importance of more aggressive implementation of customer programs, especially given the potential synergy between the goals of the Carbon Plan and the outcomes supported by customer programs.[79] Effective programs can be designed to allow the customer to pay the cost, take the risk, and receive the corresponding benefit of the renewable resource. Creating programs that are open to subscription by certain categories of customers that need to meet their own ESG and renewable goals is a cost effective way to meet the mandates of HB 951. Similarly, customer programs can be used to "shrink the challenge" and reduce the demand on the system. These programs not only reduce demand, but they can also provide system resiliency and reliability benefits.

The Commission should explore how the Companies can meet their obligations under HB 951 while also allowing customers to meet their ESG goals in a cost effective

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[79] Walmart Comments, Docket No. E-100, Sub 179, at 14-19 (July 15, 2022); CUCA's Comments Regarding Carbon Plan, Docket No. E-100, Sub 179, at 15-16 (July 15, 2022); and CIGFUR Witness Gorman Testimony, at 7 (Tr. Vol. 22, p. 23) (discussing need for new energy efficiency and demand-side management programs for Duke's customers, including design of curtailment and interruptible rates with customers benefits). *See also* Public Staff Witness Thomas Testimony, at 58-59 (Tr. Vol. 21, pp. 86-87) (noting that issue of customer renewable programs has been raised by "multiple intervenors and was particularly emphasized by commercial and industrial groups"; encourages Duke to work with stakeholders).

manner. The Companies should work collaboratively to develop demand response and distributed energy programs of interest to large users to help reduce system demand while increasing resiliency and reliability. These steps are a critical component of a "no regrets" strategy towards carbon reduction.

I. No "pre-approval" of relief from statutory deadlines.

The Commission has significant discretion about the timing of resource changes within the Carbon Plan.[80] However, the Commission's discretion to extend the deadlines for achieving the carbon reduction goals is constrained by the requirements in section 62-110.9(4). Specifically, no extensions are permitted except "to allow for implementation of solutions that would have a more significant and material impact on carbon reduction." N.C. Gen. Stat. § 62-110.9(4).

As demonstrated persuasively by the Attorney General's Office and NCSEA, *et al.*, in their respective briefing in this proceeding,[81] the Companies have presented insufficient evidence, at this time, to justify an extension of either of the statutory deadlines; therefore, it would be premature to conclude that relief from the 2030 interim deadline should be granted. Duke's portfolios that fail to meet the interim carbon reduction goal by 2030 (Portfolios 2, 3, 4, 5, and 6) do not delay meeting the 70% carbon reduction mark in order to implement "solutions that would have a more significant and material impact on carbon reduction." Rather, these alternative portfolios delay achievement of the interim goal while

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[80] *See, e.g.,* Tech Customers' Comments on Non-Hearing Issues Relating to Duke's Proposed Carbon Plan, Docket No. E-100, Sub 179, at 21 (Sept. 9, 2022).

[81] Responsive Comments of AGO filed Sept. 9, 2022, at 7-11; Joint Responsive Comments of NCSEA, *et al.*, filed Sept. 9, 2022, at 6-8.

deploying a similar mix of technologies; by 2035, the mix of technologies among portfolios 1-4 is essentially the same.[82] The delay is a result of failing to implement higher levels of solar and battery storage prior to 2030, not a result of delaying to allow implementation of an alternative technology.

J. Future improvements to modeling.

A secondary objective of the Commission should be to make use of the lessons learned in this initial Carbon Plan proceeding to improve the process for the next biennial proceeding. The evidence shows that the intervenors seeking to replicate Duke's use of EnCompass modeling encountered numerous, preventable challenges that significantly impeded their work.[83] The Tech Customers would respectfully request that the Commission proactively address these challenges going forward to ensure that intervenors have full opportunity to meaningfully evaluate future modeling.

First, before distributing their modeling inputs and outputs to intervenors, the Companies should internally validate their modeling data to ensure that there are no errors in their uploaded data files (such as was found with the partial unit export data and the declining cost adder)[84] and to confirm that the Companies themselves can replicate their own modeling before expecting other parties to do so.[85] Second, the Companies should rely on the modeling platform to conduct as many modeling steps as possible and should limit

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[82] Duke Carbon Plan Ch. 3, p 3 (Figs. 3-1 and 3-2).

[83] *See, e.g.,* Informational Filing of NCSEA *et al.*, Docket No. E-100, Sub 179 (July 8, 2022) (detailing various technical issues with EnCompass database as delivered by Duke); Direct Testimony of Tyler Fitch on behalf of NCSEA *et al.*, at 42; Tech Customers Witness Roumpani Testimony, at at 21-22 (Tr. Vol. 25, pp. 104-05).

[84] Tr. Vol. 25, pp. 104-05 (Tech Customers Witness Roumpani).

[85] Tr. Vol. 25, p. 104 (Tech Customers Witness Roumpani).

their use of out-of-model steps (such as the manual adjustments like the CT-Battery Optimization, coal retirement dates, and the calculation of economic carrying charges).[86] Third, the Companies should provide their workpapers supporting their modeling at the time they produce their modeling data—rather than wait for intervenors to request this critical information.[87] Finally, any out-of-model processing (such as use of SERVM to assess reliability) should be fully available to intervenors along with, and at the same time as, the other components of the modeling conducted by Duke.

These improvements will help streamline the discovery process, will help ensure a "level playing field" for intervenors seeking to utilize and "stress test" the modeling done by Duke, and will facilitate more robust and productive participation in the planning process by intervenors—all of which will advance the public interest.[88]

V. RESPONSES TO THE COMPANIES' NEAR-TERM ACTION REQUESTS.

With the foregoing framework in mind, for the sake of completeness, the following discussion addresses each issue identified in the enumerated requests for relief in Duke's Petition.[89]

A. The Commission should decline Duke's request, as framed, for a declaration of the reasonableness of its "modeling" and "plan."[90]

1. Duke is only seeking approval of short-term actions.

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[86] Tr. Vol. 25, p. 101-03 (Tech Customers Witness Roumpani).

[87] Tr. Vol. 25, p. 105 (Tech Customers Witness Roumpani).

[88] *See also* NCSEA, *et al.*, Witness Fitch Testimony, at 42-44 (Tr. Vol. 24, pp. 169-71); (recommendations for improvements to modeling processes).

[89] Verified Petition for Approval of Carbon Plan, In the Matter of Duke Energy Progress, LLC, and Duke Energy Carolinas, LLC, 2022 Biennial Integrated Resource Plans And Carbon Plan, Docket No. E-100, Sub 179 (May 16, 2022) (hereinafter, "Petition").

[90] *Id.* at 15, item 1.

The Tech Customers appreciate the magnitude of the challenge and the scope of the effort undertaken by the Companies to develop their initial Portfolios, the supplemental portfolios, and additional analyses. At a high level, the variety of portfolios submitted by the Companies and Intervenors indicates an analysis that is appropriate to the task, including Duke's use of the EnCompass software tool to inform portfolio analysis. The Tech Customers agree, and the record shows, that use of the EnCompass model—as a technological platform—is reasonable, and the Commission may wish to find that using EnCompass for Carbon Plan modeling is reasonable.

However, Duke's broad request for approval of the totality of its modeling and affirmation of the entirety of its "plan" should be denied, as framed. To be clear, Duke has not proposed that the Commission "select" a particular portfolio.[91] It has only asked that the Commission endorse a series of specific short-term actions lasting until the next biennial Carbon Plan review. The Tech Customers acknowledge the complexity of the task before the Commission and the number of significant, decision-impacting matters which remain unresolved. These uncertainties include South Carolina's willingness to share in costs mandated by the Carbon Plan, the impacts of the recently enacted federal Inflation Reduction Act of 2022 ("IRA"), which has yet to be fully evaluated and modeled for purposes of this planning exercise, legal issues surrounding the availability of third-party resources under HB 951, and the costs and timing associated with offshore wind resources.

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[91] Of course, Duke Portfolios 2, 3, 4, 5, and 6 do not achieve the 2030 carbon reduction goals, are therefore not "reasonable" as a matter of law, and would not constitute allowable plans for the Commission to adopt under HB 951. *See, e.g.*, Modeling and Near-Term Actions Panel Exhibit 1 p. 25 & Exhibit 2 p. 2.

However, it is not appropriate nor necessary for the Commission to endorse the entirety of Duke's modeling efforts.

There is nothing in HB 951 that obligates the Commission to approve Duke's modeling or to determine that it is reasonable. As discussed, the Commission's objective in this proceeding should be to determine a short-term plan of "no regrets" actions (e.g., solar procurement) that are necessary to achieve the 2030 and 2050 carbon reduction goals without precluding achievement of the least cost pathway. In practice, this means identifying which steps should be taken now and which steps can—and therefore should—be deferred until later, consistent with achieving the carbon reduction goals.

2. A declaration that the entirety of Duke's modeling is "reasonable for planning purposes" is not supported by the evidence.

While use of the EnCompass software was appropriate, and while Duke's modeling—along with the modeling conducted by other parties—provides a sufficient basis for Commission decision on certain near-term actions, Duke's request that the Commission approve the entirety of its portfolios as "reasonable for planning purposes" is inappropriate based on the record.

For starters, all non-Duke parties attempting to utilize the model were unable to fully replicate Duke's results. The Gabel Report, and the testimony of witnesses Borgatti, Roumpani, and Kimbrough, describe issues and concerns with Duke's modeling. First among these is the fact that no party, apparently including Duke, was able to replicate the

results presented in Duke's portfolios.[92] The Public Staff noted that it was able to reproduce Duke's results only approximately, and only through 2040.[93] Without this verification, it is difficult to say much about the reasonableness of the particular modeling runs that produced Duke's portfolios.

Additionally, all non-Duke parties attempting to run the model detailed concrete technical shortcomings in Duke's modeling inputs and assumptions. Among these are:

- Overly restrictive constraints on the amount of new solar.[94]
- Manual adjustments to coal plant retirement dates.[95]
- Overly restrictive optimization period of 8 years as opposed to a longer period.[96]
- Non-economic replacement of batteries with combustion turbines (CTs).[97]

Since Duke filed its initial Carbon Plan portfolios, it has made a number of significant corrections to its modeling. For instance, in its supplemental portfolios, Duke corrected limitations to the solar plus storage dispatch profile in response to intervenor comments, resulting in substantial changes to the modeling outputs.[98] The corrections

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[92] Tr. Vol. 10, pp. 61-68; Tr. Vol. 21, p. 369-71 (Public Staff witness Thomas); Tr. Vol. 25, p. 105 (Tech Customers witness Roumpani).

[93] Tr. Vol. 21, p. 369-71 (Public Staff witness Thomas).

[94] Tr. Vol. 25, pp. 98-99 (Tech Customers witness Roumpani); Tr. Vol. 25, pp. 411-16 (CPSA witness Hagerty); AGO Witness Burgess, at 22.

[95] Tr. Vol. 25 p. 101 (Tech Customers witness Roumpani); Tr. Vol. 25, pp. 284-93 (AGO witness Burgess); Tr. Vol. 24, pp. 171-77 (NCSEA, *et al.*, witness Fitch); Tr. Vol. 21, p. 52 (Public Staff witness Thomas).

[96] Tr. Vol. 25, pp. 99-100 (Tech Customers witness Roumpani); Tr. Vol. 21, pp. 52-54 (Public Staff witness Thomas).

[97] Tr. Vol. 25. p. 102 (Tech Customers witness Roumpani); Tr. Vol. 21, pp. 49-52 (Public Staff witness Thomas).

[98] Tr. Vol. 25, p. 62 (Tech Customers witness Borgatti).

suggest, consistent with the concerns expressed by intervenors' experts, that the Carbon Plan modeling is still very much a work in progress.

Additionally, Duke made a number of "hard coded" selections in its modeling that do not reflect economic selection of least cost power generation and that are unnecessary to maintain reliability.[99] For instance, Duke's "Battery-CT Optimization" step manually replaced 35 percent of battery storage economically selected by EnCompass with new CT generation. In other words, Duke's request for approval of near-term CT development reflects a deliberate choice by Duke for the addition of CT resources, not economic selection. Similarly, Duke manually overrode the coal plant retirement dates selected by EnCompass. As a result, Duke's modeling presented in this case lacked the flexibility needed to determine the least cost path.

The Commission need not and should not approve Duke's specific modeling choices which have been placed in issue by intervenors.

3. Duke's plan fails to comply with the requirements of HB 951 because it fails to consider the use of purchased power as a resource option.

As previously discussed, HB 951 requires the Commission to follow its existing practices with respect to least cost planning and authorizes the Commission to consider purchased power as part of the Carbon Plan.[100] The Commission directed Duke to submit

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[99] *See, e.g.,* Direct Testimony of Maria Rompani, Ph.D., on behalf of Tech Customers, at 15-21; Direct Testimony of Tyler Fitch on behalf of NCSEA, *et al.*, at 11-14; Direct Testimony of Edward Burgess on behalf of AGO, at 21-37; Gabel Report, at 10, 47-48; Strategen Report, at 8-10.

[100] Section IV.B., *supra*; Tech Customers' Comments on Proposed Carbon Plan, Docket No. E-100, Sub 179, at 5-9, 18-23 (July 15, 2022); Tech Customers' Comments on Non-Hearing

"a Carbon Plan that is consistent with the requirements of Section 1 of S.L. 2021-165,"[101] which requires compliance with the Commission's least cost planning practices, as described in Rule R8-60. Rule R8-60, in turn, requires an analysis of "the potential benefits of soliciting proposals from wholesale power suppliers and power marketers to supply it with needed capacity."[102]

As discussed in Section IV.B *supra*, a least cost plan would consider all potential supply-side and demand-side resources that could be employed in meeting the carbon reduction goals while maintaining grid adequacy and reliability. However, Duke's analysis in the Carbon Plan was mostly limited to modeling existing PPAs until their expiration, and did not consider a broader use of purchased power for other purposes, for instance, to avoid near-term investments in additional natural gas capacity. Because Duke's Carbon Plan portfolios do not consider purchased power as a new resource option, Duke's submissions do not comply with HB 951. The failure to consider purchased power as a new

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Issues Relating to Duke's Proposed Carbon Plan, Docket No. E-100, Sub 179, at 2-15 (Sept. 9, 2022).

[101] *Order Requiring Filing of Carbon Plan and Establishing Procedural Deadlines*, In re Duke Energy Progress, LLC, and Duke Energy Carolinas, LLC, 2022 Biennial Integrated Resource Plans and Carbon Plan, Docket No. E-100, Sub 179, at 3 (Nov. 19, 2021).

[102] N.C.U.C. Rule R8-60(d).

resource option effectively guarantees that Duke's portfolios are not the least cost path to achieving HB 951's carbon reduction goals.

4. Duke's plan fails to fully evaluate the impacts from the enactment of the federal IRA.

The IRA significantly alters the costs of new energy resources, but, due to the timing of the passage of the law, Duke was not able to fully evaluate the impacts of the IRA in its Carbon Plan submissions for purposes of this proceeding.

The IRA reduces the cost of renewables relative to new natural gas generation.[103] However, Duke was not able, within the constraints of this proceeding, to thoroughly model the IRA's impacts on the Carbon Plan. For instance, Duke was not able to analyze the impacts of the IRA on customer energy efficiency programs[104] or on offshore wind costs.[105]

In other words, Duke's plans do not incorporate a new law that specifically impacts a central question in this proceeding: What is the least cost path to achieving the State's carbon reduction goals? The Commission should avoid making findings that suggest that the current state of Duke's modeling efforts reasonably reflect the relative costs of renewable energy generation given the uncertainty with the existing analysis.

5. Other parties, including Tech Customers, have proposed appropriate models that present alternatives which are "reasonable for planning purposes."

Other parties have presented viable models, including the Tech Customers' Preferred Portfolio developed by Gabel Associates, and the modeling efforts performed by

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[103] *E.g.*, Tr. Vol. 10, p. 46 (Duke witness Snider).
[104] Tr. Vol. 13, pp. 174-75 (Duke witness Duff).
[105] Tr. Vol. 18, p. 83 (Duke witness Repko).

the Brattle Group and Synapse. Without necessarily concurring with all of the assumptions and other discrete modeling choices made by Brattle and Synapse or their modeling results, Tech Customers believe that all of the Intervenors' modeling efforts and portfolios provide useful information and context for the Commission to develop a short-term action plan in this proceeding. Accordingly, should the Commission find that Duke's portfolios are "reasonable for planning purposes," it should likewise find that the portfolios submitted by the intervenors in this proceeding are also reasonable for planning purposes.

In developing the Preferred Portfolio, Gabel and Strategen started with the EnCompass model created by Duke, but ended up with a substantially different portfolio of generating assets. The divergent results were supported by additional sensitivity testing, showing that the Preferred Portfolio is reasonable for the purpose of assisting the Commission in developing the Carbon Plan, and particularly addressing actions needed in the short term.

The changes Gabel and Strategen modeled include the following: (1) accelerating all coal retirements to 2030 or earlier; (2) installing renewable generation at retired coal sites; (3) considering additional interregional energy imports; (4) correcting cost estimates that biased Duke's results in favor of natural gas generation and against renewable generation; (5) correcting Duke's decision to override the economic selection of solar plus storage resources; (6) increasing the model's ability to adopt behind-the-meter solar resources; and (7) evaluating the portfolio on a single time horizon through 2050.[106]

As a result of these adjustments to Duke's modeling assumptions, Tech Customers' Preferred Portfolio, for instance, presents a superior generation mix that best balances the

[106] Gabel Report at 5-9, 48; Tr. Vol. 25, pp. 45-46.

competing objectives of compliance with the statutory carbon goals, ensuring the grid's reliability, and protecting ratepayers from needless or unwarranted costs.[107] Importantly, the Preferred Portfolio also shows that immediate new natural gas is not only unnecessary, but a portfolio without combined cycle resources can lower both the NPVRR and emissions compared to Duke's Portfolio 1, which is the only Duke portfolio that achieves the state's energy policy objective.[108]

Duke's criticisms of the Preferred Portfolio, moreover, do not withstand scrutiny. Although the Companies presented numerous arguments to try to undermine the validity of the Preferred Portfolio, these arguments were dissected and discarded over the course of the proceeding:

- **Not biased against gas resources.** Duke mistakenly mischaracterized the Preferred Portfolio as being biased against gas.[109] However, Duke admitted under cross-examination that the Preferred Portfolio selects natural gas resources in the near term in order to maintain reliability, not purely based on economics.[110] And although the Preferred Portfolio purposefully modeled a "no new CC" solution, the Public Staff agreed on cross-examination that this modeling assumption was not unreasonable as a means of accounting for the risks posed by natural gas supply.[111]

- **Available PPAs**. Duke claims that Gabel Associates "presents no justification" for the Preferred Portfolio selecting PPAs from third-party natural gas plants that operate in North Carolina.[112] On cross-examination, however, Duke conceded that Gabel Associates had identified three merchant plants in North Carolina *with which Duke already contracted for power*, looked at when additional capacity would be available at those plants, and added a 5% premium to account for Duke having to compete to secure the extra capacity.[113]

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[107] Tr. Vol. 25, p. 44 (Duke witness Duff).
[108] Tr. Vol. 25, p. 46 (Tech Customers witness Borgatti).
[109] Tr. Vol. 7, p. 377 (Duke witness Snider).
[110] Tr. Vol. 10, p. 76-79 (Duke witness Quinto).
[111] Tr. Vol. 22, pp. 312-13 (Public Staff witness Thomas).
[112] Tr. Vol. 7, pp. 386-87 (Duke witness Snider).
[113] Tr. Vol. 10, pp. 129-31 (Duke witness Snider).

- **Coal retirement**. Although Duke's pre-filed testimony criticized the Preferred Portfolio for aggressively retiring coal resources without "meaningfully engag[ing]" with the associated transmission challenges,[114] under cross-examination Duke admitted that Gabel Associates' proposed retirement schedule accounted for all of the transmission challenges for which Duke itself had cautioned.[115]

- **Energy Efficiency forecast.** Duke criticized Gabel Associates for developing EE levels based on the American Council for an Energy Efficient Economy.[116] Under cross-examination, however, Duke's experts admitted that Gabel Associates had adjusted the state-level data by excluding co-ops and municipalities and that the ACEEE used a baseline similar to Duke's baseline in the *Duke Energy North Carolina EE and DSM Market Potential Study.*[117] (Notably, Commissioner McKissick asked Duke to provide a late filed exhibit of a roadmap for achieving 1.5% EE savings.[118]) Nevertheless, to address Duke's criticism, Dr. Roumpani ran a sensitivity that reduce the EE levels to match Duke's modeling (and also reduce the adoption of BTM) and determined that the Preferred Portfolio still produced a cheaper resource plan with lower carbon emissions than Duke's Portfolio 1.[119]

- **Reliability.** Duke ran an out-of-model analysis of the reliability of the Preferred Portfolio using SERVM and claimed the Preferred Portfolio failed the test.[120] As the Public Staff testified, nobody had access to SERVM and nobody could replicate the analysis or verify the results.[121] Although Gabel Associates questions the validity of Duke's SERVM analysis, Dr. Roumpani nevertheless ran a sensitivity that delayed the retirement of Belews Creek to match Duke's modeled retirement date, which provided more than enough capacity to account for the purported reliability shortfall.[122] With the sensitivity, the Preferred Portfolio still produced a cheaper resource plan with lower carbon emissions than Duke's Portfolio 1.[123]

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[114] Tr. Vol. 16, pp. 99-100 (Duke witness Roberts).
[115] Tr. Vol. 16, pp. 218-22 (Duke witness Roberts).
[116] Tr. Vol. 13, pp. 24-25 (Duke witness Duff).
[117] Tr. Vol. 14, pp. 25-27 (Duke witness Duff).
[118] Tr. Vol. 14, pp. 73-82.
[119] Tr. Vol. 25, pp. 95-96 (Tech Customers witness Roumpani).
[120] Tr. Vol. 7, p. 202 (Duke witness Snider).
[121] Tr. Vol. 21, pp. 373-74 (Public Staff witness Thomas).
[122] Tr. Vol. 25, pp. 90-91 (Tech Customers witness Roumpani).
[123] Tr. Vol. 25, p. 91 (Tech Customers witness Roumpani).

The record demonstrates that the Preferred Portfolio, in conjunction with its subsequent sensitivity analyses, is reasonable for planning purposes and sufficiently robust that it can provide useful guidance to the Commission in crafting short-term Carbon Plan actions, particularly in light of the fact that it actually achieved the interim carbon reduction goal and is lower cost than Duke's alternative.

B. Duke's requests for approval of near-term supply-side development and procurement[124] should be approved in part, denied in part, and revised to conform to the requirements of HB 951 and the record in this proceeding.

1. 3,100 MW of solar, 1,600 MW of battery storage, 600 MW of onshore wind, 800 MW of CTs, 1200 MW of CCs.

As discussed, the Commission's objective in this proceeding should be to identify "no regrets" actions to be undertaken in the short-term to achieve the 2030 and 2050 carbon reduction goals without overcommitting to a path that may not be the least cost pathway to achieving those goals.

a. *The record supports additional short-term solar procurement.*

With the different perspectives presented in this proceeding, there are few areas of widespread consensus. One of those few areas of consensus, confirmed by the various model portfolios, is that more new solar generation will need to be added to the Companies' resource mix in the near-term to reach the 2030 carbon reduction goals. Duke's portfolios project the addition of 3.5 to 5.4 GW by 2030;[125] the Brattle Group's modeling achieved the 2030 compliance target by adding anywhere from 5.2 GW to 9.5 GW of solar by 2030; Synapse's modeling achieved the 2030 goal by adding 7.2 GW of solar by 2030; and the

[124] Petition at 15, item 2.
[125] Carbon Plan Chapter 3, Fig. 3-5.

Gabel Report's Preferred Portfolio achieves 2030 compliance by adding some 1.4 GW of standalone solar and 4.7 GW of solar+storage (and additional behind-the-meter solar generation). The projected need for solar in the near-term requires an aggressive solar procurement strategy.

There is broad consensus among the modeling results and among the parties that increased solar procurement is needed in the short-term in order to enable achievement of the 2030 target.[126] The only Duke portfolio that achieves the 2030 target implements 5.4 GW of solar by 2030, supporting the notion that Duke's request for an initial procurement of 3,100 MW of solar is the "bare minimum" that should be selected.[127]

b. ***The record supports deferring a decision on new gas generation.***

As discussed above, the evidence in this proceeding shows that a commitment to new natural gas plants is accompanied by significant fuel-supply and stranded-asset risks. These risks can be mitigated by delaying the selection of additional natural gas plants until the 2024 Carbon Plan proceeding. By 2024, the Commission will have the benefits of further clarity on the transportation relief that MVP is expected to provide and of additional insight into economics of gas generation compared to IRA-incentivized renewable generation. For these reasons, the Commission should defer any decision on Duke's request for selection of new CT and CC generation until the 2024 Carbon Plan proceeding.

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[126] *See, e.g.*, Gabel Report pp. 51-52; Brattle Report pp. 29-34; Synapse Report pp. 4-5; Strategen Report p. 46; Tr. Vol. 21, pp. 91-98 (Public Staff witness Thomas); Tr. Vol. 25, pp. 294, 335-36 (AGO witness Burgess); Tr. Vol. 26, pp. 47-52, 143-45 (CPSA witness Norris).

[127] Tr. Vol. 25, pp. 335-36 (AGO witness Burgess).

C. Duke's request for approval of initial development of offshore wind and SMRs should be denied.

Commission approval of offshore wind and SMR development activities is unnecessary and not supported by the evidence at this time.

The Tech Customers generally support the use of offshore wind and expect it will provide significant carbon-free generation to North Carolina in the future. However, given the length of time before offshore wind is expected to be needed, and given that it appears that Duke's unregulated affiliate[128] and independent power producers[129] will continue to develop wind projects off the coast of North Carolina (even in the absence of its selection in this first Carbon Plan), there seems to be little or no risk to waiting to decide this issue. Because the "no regrets" choice is the best choice in this proceeding, the Commission should defer a decision on offshore wind development to the next Carbon Plan proceeding.

As to small modular reactors, this immature technology presents substantial risk that development expenses in the short-term risks ratepayers paying for facilities that will never be built. Deferring approval of SMR development considerations until the next Carbon Plan proceeding is a clear no-regrets choice. In addition, it should be noted that nuclear project development is subject to N.C. Gen. Stat. § 62-110.7(b), and Duke can raise the need for nuclear development costs at any time should further analysis demonstrate the criticality of SMR development expenses in the short-term.

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[128] Tr. Vol. 17, p. 134 (Duke witness Repko).

[129] *E.g.*, Limited Comments of Avangrid Renewables, LLC, Docket No. E-100, Sub 179 (July 15, 2022).

D. Duke's requests for specific findings regarding development costs for offshore wind, SMRs, and pumped hydro should be denied.

The Commission should deny Duke's request for specific findings regarding offshore wind, SMR, and pumped hydro development costs.

The Commission should avoid making determinations regarding whether development expenses are reasonable and prudent outside of a general rate case, and should not "preapprove" development costs by making a finding of reasonableness and prudence. In this regard, even in the case of nuclear development, where the Commission has authority to review the reasonableness and prudence of deciding to incur costs, it lacks authority to actually approve such costs.[130] The Companies appear to agree that determination of the reasonableness and prudence of any specific costs in this proceeding would be inappropriate.[131] To the extent Duke seeks "assurances" that the development costs will be recoverable, such a request is premature and should be denied.

Duke has not shown that initial development activities for long lead time resources are currently necessary, and the Commission should deny Duke's request for approval of such activities as reasonable and prudent at this time. Moreover, in any event, the Commission should deny any request that would prejudice future proceedings on the reasonableness and prudence of any particular costs incurred by Duke with respect to these initial development activities.

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[130] N.C. Gen. Stat. § 62-110.7(b).

[131] Duke Energy Carolinas, LLC and Duke Energy Progress, LLC's Pre-Hearing Comments on Non-Expert Track Legal and Policy Issues, Docket No. E-100, Sub 179, at 50 (Sept. 9, 2022).

Duke has withdrawn its request for authorization of deferral of long lead-time resources, and that request should be denied.[132]

Finally, the Commission should deny Duke's request for assurances that the costs of long lead time resources will be recoverable through base rates if they are ultimately determined to be unnecessary. It is premature for the Commission to promise recovery of project development costs when there has been no determination that the costs were reasonable and prudent.

E. Duke's request that the Commission approve proposed actions regarding supply-side resources[133] should be denied.

The Tech Customers do not oppose Duke's proposed efforts to continue to upfit certain gas powered plants for more flexible operation or license applications to continue nuclear operations at existing plants. However, the Commission should not "approve" any specific actions or take any steps that suggest a guaranteed recovery for all such actions until they have been shown to be reasonable and prudent in a general rate case. Accordingly, this request should be denied.

F. The Commission should take action to push Duke to accomplish more with respect to Grid Edge and customer programs, including BTM solar.[134]

The Tech Customers support Duke undertaking additional efforts to drive customer participation in energy efficiency and other programs, including behind-the-meter ("BTM") solar.

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[132] *Id.* at 49.
[133] Petition at 16, item 3.
[134] Petition at 17, item 4.

Duke refers to its modeled goal of achieving energy efficiency load reduction of 1% of load as "ambitious," an opinion shared by the Public Staff. But regardless of the adjective that is used, all parties acknowledge that energy efficiency and Grid Edge activities are a critical component of any plan to achieve the carbon reduction goals and inherently least cost. As has been pointed out, Duke has achieved near or exceeded 1% load reduction in the past seven years, and a number of other states and utilities have achieved energy efficiency savings greater than 1% a year.[135] Duke's 1% energy efficiency assumption appears to be an assumption of continued business as usual, rather than a transformative effort to "shrink the challenge" appropriate to the task at hand.

In addition to seeking more savings from energy efficiency, the Commission should also push Duke to create new and innovative programs encouraging and supportive of its customers to adopt behind-the-meter renewable energy strategies. While BTM solar is not critical to the near-term actions recommended by the Gabel Report,[136] the report's analysis shows that rapid growth in BTM solar is being achieved in other states and that significant BTM resources contribute to a lower-cost path to meeting the carbon reduction goals. Gabel Report, at 42-45. The fact that Duke's solar rebate and other customer programs are typically fully subscribed for residential and commercial customers suggests that there is significant unmet demand in this area.

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[135] Gabel Report, at 37-38; Tr. Vol. 25, pp. 308-09 (AGO witness Burgess).

[136] Dr. Roumpani's sensitivity analysis showed that the Preferred Portfolio is not substantially affected in the near term by a reduction in growth of BTM solar from that modeled in the Preferred Porftolio. Tr. Vol. 25, pp. 95-96 (Tech Customers witness Roumpani).

These concerns are particularly significant because the IRA provides funding that could be used to enhance customer participation, but Duke has been unable to fully consider what that may look like.[137] The Carbon Plan and the IRA present a significant opportunity for the Commission and Duke to address carbon emissions from a different angle while providing direct benefits to ratepayers.

The Commission should continue to work with and to push Duke to do more with regard to energy efficiency and customer programs. In the end, that will be key to achieving the least cost path to for the Carbon Plan and will benefit all customers.

With regard to the EE/DSM Cost Recovery Mechanism system benefits determination, Tech Customers believe that any such determination should be made in a separate, comprehensive proceeding dedicated to that mechanism.

G. The transmission planning process should be reformed to achieve the least cost pathway to carbon reduction.[138]

There is no doubt that Duke's transmission system is the backbone of the grid on which the success of the Carbon Plan will depend. Any reasonable plan, including in the near-term, needs to consider the need for improved transmission to interconnect the large amounts of solar generation that will be needed to reach the 2030 carbon reduction goal.

The parties in this proceeding have made a number of helpful suggestions regarding how the transmission planning process can be improved. Among those recommendations

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[137] Tr. Vol. 13, pp. 174-75 (Duke witness Duff).
[138] Petition at 17, item 5.

the Gabel Report recommends the development of a coordinated, portfolio-based transmission plan through the NCTPC.[139, 140]

CONCLUSION

The Commission has a difficult task in front of it, but this proceeding has provided sufficient guidance to take on the task of developing a Carbon Plan to begin moving the state toward achieving HB 951's carbon reduction goals. The Commission should focus in the short term on new solar procurement and improving the transmission planning process, including the coordination of transmission planning with new resource planning. The Commission should defer decisions on resources such as offshore wind, SMRs, and new natural gas generation until the next Carbon Plan proceeding.

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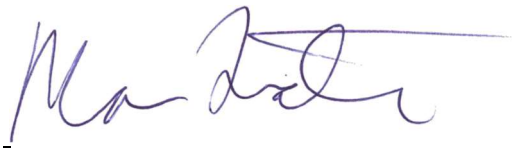
[139] Gabel Report pp. 15-17; *see also* Tr. Vol. 25, pp. 448-52 (CPSA witness Hagerty recommending combined transmission and resource planning).

[140] For the sake of completeness, Tech Customers note the following as to the remaining portions of the Companies' request for relief: First, the Tech Customers take no position, at this time, on Duke's request that Commission approve Companies' carbon accounting methods. Second, Tech Customers take no position, at this time, on Duke's request that Commission affirm next Carbon Plan update in 2024 and IRP delayed to 2024. Third, Tech Customers take no position on Duke's request for process to make revisions to R8-60. *See* Petition 17, items 6–8.

Respectfully submitted, this 24th day of October, 2022.



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Certificate of Service

I hereby certify that a copy of the foregoing TECH CUSTOMERS' POST-HEARING BRIEF has been served this day upon all parties of record in this proceeding, or their legal counsel, by electronic mail.

This the 24th day of October, 2022.

BROOKS, PIERCE, MCLENDON,
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/s/ Craig D. Schauer
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