STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. E-100, SUB 179

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of Duke Energy Progress, LLC, and Duke Energy Carolinas, LLC, 2022 Biennial Integrated Resource Plans and Carbon Plan	))))	PARTIAL PROPOSED ORDER OF THE TECH CUSTOMERS

HEARD: Monday, July 11, 2022, at 7:00 p.m., Durham County Courthouse, 510 S. Dillard St., Durham, North Carolina.

Tuesday, July 12, 2022, at 7:00 p.m., New Hanover County Courthouse, 316 Princess Street, Wilmington, North Carolina.

Wednesday, July 27, 2022, at 7:00 p.m., Buncombe County Courthouse, 60 Court Plaza, Asheville, North Carolina.

Thursday, July 28, 2022, at 7:00 p.m., Mecklenburg County Courthouse, 832 E. 4th Street, Charlotte, North Carolina.

Tuesday, August 23, 2022, at 1:30 p.m., via WebEx Videoconference.

Tuesday, September 13, 2022, at 9:00 a.m., 430 North Salisbury Street, Raleigh, North Carolina.

BEFORE: Chair Charlotte A. Mitchell, Presiding; and Commissioners ToNola D. Brown-Bland, Daniel G. Clodfelter, Kimberly W. Duffley, Jeffrey A. Hughes, Floyd B. McKissick, Jr., and Karen M. Kemerait

APPEARANCES:

For Duke Energy Carolinas, LLC, and Duke Energy Progress, LLC:

Jack E. Jirak, Esq.
Kendrick C. Fentress, Esq.
Jason A. Higginbotham, Esq.
Kathleen Hunter-Richard, Esq.
Duke Energy Corporation

Post Office Box 1551
Raleigh, North Carolina 27602

Andrea Kells, Esq.
E. Brett Breitschwerdt, Esq.
Nicholas A. Dantonio, Esq.
McGuireWoods LLP
501 Fayetteville Street, Suite 500
Raleigh, North Carolina 27601

Vishwa B. Link, Esq.
McGuireWoods LLP
Gateway Plaza
800 East Canal Street
Richmond, Virginia 23219-3916

Lara S. Nichols, Vice President,
State & Federal Regulatory Legal
Duke Energy Corporation
4720 Piedmont Row Drive
Charlotte, North Carolina 28210

For the Using and Consuming Public:

Lucy Edmondson, Esq., Chief Counsel
Robert Josey, Esq.
Nadia L. Luhr, Esq.
Anne Keyworth, Esq.
William E.H. Creech, Esq.
William Freeman, Esq.
Public Staff - North Carolina Utilities Commission
4326 Mail Service Center
Raleigh, North Carolina 27699-4300

For the Using and Consuming Public, The State, and Its Citizens:

Margaret Force, Esq., Special Deputy Attorney General
Tirrill Moore, Esq., Assistant Attorney General
North Carolina Department of Justice
Post Office Box 629
Raleigh, North Carolina 27602

For Tech Customers (Apple Inc., Google LLC, and Meta Platforms, Inc.):

Marcus W. Trathen
Craig D. Schauer

Brooks, Pierce, McLendon, Humphrey & Leonard, LLP
Suite 1700, Wells Fargo Capitol Center
150 Fayetteville Street
Raleigh, NC 27601

Matthew B. Tynan
Brooks, Pierce, McLendon, Humphrey & Leonard, LLP
Suite 2000 Renaissance Plaza
Greensboro, North Carolina 27401

For Carolina Utility Customers Association, Inc. (CUCA):

Craig D. Schauer
Brooks, Pierce, McLendon, Humphrey & Leonard, LLP
Suite 1700, Wells Fargo Capitol Center
150 Fayetteville Street
Raleigh, NC 27601

Matthew B. Tynan
Brooks, Pierce, McLendon, Humphrey & Leonard, LLP
Suite 2000 Renaissance Plaza
Greensboro, North Carolina 27401

For Carolina Industrial Group for Fair Utility Rates III (CIGFUR):

Christina D. Cress
Douglas E. Conant
Bailey & Dixon, LLP
Post Office Box 1351
Raleigh, North Carolina 27602

For North Carolina Sustainable Energy Association (NCSEA):

Taylor Jones, Esq., Regulatory Counsel
4800 Six Forks Road, Suite 300
Raleigh, North Carolina 27609

For Carolinas Clean Energy Business Alliance (CCEBA):

John D. Burns, Esq., General Counsel
811 Ninth Street, Suite 120-158
Durham, North Carolina 27705

For Clean Power Suppliers Association:

Ben Snowden, Esq.,

Erin Catlett, Esq.
Jack Taggart, Esq.
Fox Rothschild LLP
434 Fayetteville Street, Suite 2800
Raleigh, North Carolina 27601

For Southern Alliance for Clean Energy (SACE), Natural Resources Defense Council (NRDC), and the Sierra Club:

Gudrun Thompson, Senior Attorney
David L. Neal, Senior Attorney
Nicholas Jimenez, Esq., Senior Attorney
Southern Environmental Law Center
200 West Rosemary Street, Suite 220
Chapel Hill, North Carolina 27516

For NC WARN and Charlotte-Mecklenburg NAACP:

Matthew D. Quinn
Lewis & Roberts, PLLC
3700 Glenwood Avenue, Suite 410
Raleigh, North Carolina 27612

For the Environmental Working Group:

Andrea C. Bonvecchio, Esq.
The Law Offices of F. Bryan Brice, Jr.
127 West Hargett Street, Suite 600
Raleigh, North Carolina 27601

Carolina Leary, Esq.
1250 I Street Northwest, Suite 1000
Washington, DC 20005

For Walmart Inc.:

Carrie H. Grundmann, Esq.
Spilman Thomas & Battle, PLLC
110 Oakwood Drive, Suite 500
Winston-Salem, North Carolina 27103

For City of Charlotte:

Karen Weatherly, Esq., Senior Assistant City Attorney
600 East Fourth Street
Charlotte, North Carolina 28202

For Appalachian Voices:

Catherine Cralle Jones, Esq.
The Law Offices of F. Bryan Brice, Jr.
127 West Hargett Street, Suite 600
Raleigh, North Carolina 27601

For Redtailed Hawk Collective, Robeson County Cooperative for Sustainable Development, Environmental Justice Community Action Network, and Down East Ash Environmental and Social Justice Coalition:

Ethan Blumenthal, Esq.
ECB Holdings LLC
1624 Nandina Comers Alley
Charlotte, North Carolina 28205

For Broad River Energy, LLC:

Patrick Buffkin, Esq.
Buffkin Law Office
3520 Apache Drive
Raleigh, North Carolina 27609

For Kingfisher Energy Holdings, LLC, and for Person County, North Carolina:

Patrick Buffkin, Esq.
Buffkin Law Office
3520 Apache Drive
Raleigh, North Carolina 27609

Kurt Olson, Esq.
The Law Office of Kurt J. Olson, PLLC
Post Office Box 10031
Raleigh, North Carolina 27605

For North Carolina Electric Membership Corporation:

Tim Dodge, Esq., Regulatory Counsel
3400 Sumner Boulevard
Raleigh, North Carolina 27616

For the City of Asheville and County of Buncombe:

Jannice Ashley, Esq., Senior Assistant City Attorney
City Attorney's Office

70 Court Plaza
Asheville, North Carolina 28801

Curt Euler, Esq., Senior Attorney II
Buncombe County
200 College Street, Suite 100
Asheville, North Carolina 28801

For MAREC Action:

Bruce Burcat, Esq, Executive Director
MAREC Action
Post Office Box 385
Camden, Delaware 19934

Kurt J. Olson, Esq.
Law Office of Kurt J. Olson, PLLC
Post Office Box 10031
Raleigh, North Carolina 27605

For TotalEnergies Renewables USA, LLC, and
For Clean Energy Buyers Association:

Joseph W. Eason, Esq.
Nelson, Mullins, Riley & Scarborough LLP
4140 Parklake Avenue, Suite 200
Raleigh, North Carolina 27612

Weston Adams, Esq.
10 Nelson, Mullins, Riley & Scarborough LLP
11 1320 Main Street, Suite 1700
12 Columbia, South Carolina 29201

For Pork Council:

Kurt J. Olson, Esq.
Law Office of Kurt J. Olson, PLLC
Post Office Box 10031
Raleigh, North Carolina 27605

For Council of Churches:

James P. Longest, Jr., Esq.
Duke University School of Law
Box 90360
Durham, North Carolina 27708

For Avangrid Renewables, LLC:

Benjamin Smith, Esq.
Todd S. Roessler, Esq.
Joseph S. Dowdy, Esq.
Kilpatrick Townsend & Stockton LLP
4208 Six Forks Road, Suite 1400
Raleigh, North Carolina 2760

For Brad Rouse:

Brad Rouse, Pro se
Brad Rouse Consulting
3 Stegall Lane
Asheville, North Carolina 28805

For Sean Lewis:

Sean Lewis, Pro se
640 Firebrick Drive
Cary, North Carolina 27519

BY THE COMMISSION: On October 13, 2021, Governor Cooper signed into law House Bill 951 (S.L. 2021-165), directing the Commission to take all reasonable steps to achieve reductions in the emissions of carbon dioxide in this State from electric generating facilities owned or operated by certain electric public utilities. The Commission is directed to achieve a reduction of 70% from 2005 levels by the year 2030 and carbon neutrality by the year 2050. Session Law 2021-165 limits the applicability of this requirement to Duke Energy Progress, LLC (DEP), and Duke Energy Carolinas, LLC (DEC, together with DEP, Duke or the Companies). The Commission is directed to develop by December 31, 2022, a plan (the Carbon Plan) to achieve these emission reductions and to review the plan every two years thereafter.

On November 19, 2021, the Commission issued an order requiring Duke to file an initial carbon plan and establishing procedural deadlines. On November 29th, the Commission issued an order extending the deadline for Duke to file its initial carbon plan to May 16, 2022.

On May 16, 2022, Duke filed its Verified Petition for Approval of Carbon Plan, consisting of an executive summary, four chapters, twenty appendices, and four attachments (Petition).

Based upon consideration of the pleadings, testimony, and exhibits received into evidence at the hearings, the Stipulations, and the record as a whole, the Commission makes the following:

FINDINGS OF FACT

Authority to Approve Near-Term Actions

1. Duke's Petition seeks approval of the Companies' Carbon Plan modeling as "reasonable for planning purposes" and approval of its plan as "reasonable … for achieving HB 951's authorized CO2 emissions reductions targets in a manner consistent with HB 951's requirements and prudent utility planning."

2. The specific plan for which Duke seeks approval is a series of near-term supply-side development and procurement activities identified in Table 3 of its Petition. This near-term activities are activities to be taken in the short term prior to the 2024 update of the Carbon Plan.

3. No party appears to contest the authority of the Commission to adopt a Carbon Plan comprised of a series of near-term actions. There appears to be broad consensus among the parties that approval of a near-term action plan is appropriate in the inaugural plan.

4. The Commission has discretion under S.L. 2011-165 to approve a series of near-term actions as the Carbon Plan so long as those actions are reasonably consistent with achieving the authorized carbon reduction goals. In practice, this means that the Commission will select near-term "no regrets" actions—actions that move the Companies towards accomplishing the carbon reduction goals while simultaneously keeping open the potential to pursue multiple cost-competitive future paths to a carbon-free grid.

5. The Companies' Carbon Plan portfolios, in combination with additional modeling and evidence submitted by intervenors, provide the Commission with a reasonable basis to approve a series of near-term actions that are reasonably consistent with achieving HB 951's carbon reduction goals.

Duke's Modeling

6. The parties have presented multiple portfolios to the Commission for consideration.

7. Using the EnCompass modeling platform, Duke has presented four specific portfolios comprised of varying supply-side, energy efficiency, and DSM components for consideration by the Commission in its Carbon Plan ("P1" through

"P4"), along with certain sensitivity analyses conducted on each of the four portfolios. Of the various sensitivities, Duke conducted an Alternative Fuel sensitivity ("$P1_A$" through "$P4_A$").

8. In addition, at the request of the Public Staff, Duke has presented two additional supplemental portfolios using inputs and assumption provided by the Public Staff ("SP5" and "SP6").

9. Duke has not requested that the Commission select a specific portfolio in this proceeding, and the Commission declines to do so in this order.

10. Subject to the specific concerns identified in this order, and notwithstanding that only one of Duke's primary portfolios (P1) modeled compliance with the 2030 carbon reduction deadline, the Commission finds that the modeling conducted by Duke (P1 though P4 and SP5 and SP6) in support of its Carbon Plan was reasonable for near-term planning purposes.

Intervenors' Modeling

11. Other intervenors used modeling platforms to provide alternative portfolios.

12. The Attorney General used the EnCompass model to develop an alternative portfolio ("SP-AGO") that uses SP5 as a starting point and then makes adjustments to certain input assumptions.

13. The Tech Customers used the EnCompass model to develop their "Preferred Portfolio" that uses Duke's P1 as a starting point and then makes adjustments to certain input assumptions.

14. NCSEA *et al.* used the EnCompass model to develop their "Optimized Portfolio" that uses Duke $P1_A$ as a starting point and then makes adjustments to certain input assumptions.

15. CPSA has presented an alternative portfolio using GridSIM, a capacity-expansion and system-dispatch model, that incorporated most of Duke's modeling assumptions such as load growth, natural gas prices, coal retirements, and planning reserve margins.

16. The Commission declines to select any portfolio presented by the Public Staff, the Attorney General, or intervenors as the single path to achievement of the carbon reduction goals specified in HB 951.

17. Subject to the specific concerns identified in this order, the Commission concludes that the modeling conducted by intervenors was reasonable for near-term planning purposes.

Future Modeling

18. Duke's modeling fails to adequately consider purchased power as a potential least-cost resource. For its next IRP filings required by Commission Rule R8-60(h)(1) in September 2023,[1] as well as in its 2024 Carbon Plan update, Duke should fully incorporate potential power purchases into its modeling and proposals.

19. The Inflation Reduction Act of 2022 (IRA) has the potential to substantially decrease the relative future costs of solar, wind, nuclear, and storage technologies. Notwithstanding the enactment of IRA, due to the timing of enactment and the evolving administrative implementation of the law, Duke was unable to incorporate the full impacts of the Inflation Reduction Act of 2022 in its modeling for purposes of the inaugural Carbon Plan. For its next IRP filings required by Commission Rule R8-60(h)(1) in September 2023, as well as in its 2024 Carbon Plan update, Duke should fully incorporate the projected impacts of IRA into its modeling and proposals.

20. In light of the extensive evidence of difficulties encountered by intervenors in utilizing the model inputs and results as delivered by Duke, the Commission finds it appropriate to require Duke to make the following adjustments to its delivery of modeling inputs and outputs for purposes of the 2024 update to the Carbon Plan.

a. In consultation with stakeholders, Duke should establish a date certain for providing a functioning and validated model database to intervenors at least ninety days prior to any applicable deadline for intervenor comments and/or testimony.

b. The model data made available should include all components relied on by Duke, including any reliability modeling.

c. Duke should minimize out-of-model steps and calculations to improve transparency and reduce bias and human error, and to clearly document all calculations and assumptions determined outside of the model.

d. All work papers supporting the model should be provided with, and at the same time as, the database.

[1] *See* Order Requiring Filing of Carbon Plan and Establishing Procedural Deadlines, Docket No. E-100, Sub 179 (Nov. 19, 2022), at 1.

e. Duke should establish a more formalized process to ensure timely responses and communications regarding modeling issues.

Near-Term Supply-Side Development and Procurement

21. It is reasonable and appropriate to approve specific near-term actions which are consistent with the achievement of the carbon reduction goals of S.L. 2021-165; which are consistent with a "no regrets" strategy targeting actions which are generally consistent with the various portfolios presented by the parties and which are not likely to result in actions or expenditures which do not result in benefits to ratepayers; and which preserve optionality with regards to a range of supply-side resources going forward.

22. Pursuant to a "no regrets" strategy, the Commission reviewed the Companies' proposed short-term actions and has determined that certain resources and actions are "no regrets" resources or actions that are appropriate for selection as part of the 2022 Carbon Plan. Other resources and actions, as discussed in detail in this order, are not suitable for selection in this proceeding and the Commission will reconsider them against in future proceedings, if so requested by the Companies or other parties.

23. Action is required in the short term to procure a sufficient amount of new solar generation (including solar plus storage) to achieve the interim 2030 carbon reduction goal.

24. An initial procurement of 3,100 MW through 2024 is required to meet the interim 2030 carbon reduction goal.

25. New natural gas fired generation is not approved as part of the near-term action plan.

26. It is unnecessary at this time to approve initial development costs of offshore wind, small modular reactors (SMRs), and pumped hydro storage.

27. More generally, it would be inappropriate for the Commission to reach ratemaking determinations as part of this Carbon Plan proceeding. To that end, the Commission's selection of near-term actions—whether those actions be procurements or development activities—as part of the Carbon Plan does not constitute approval for ratemaking or other purposes. Ratemaking determinations will only be made in the appropriate proceedings already established by statutory authority and Commission rules and practices.

28. In order to encourage greater enhancements in energy efficiency, it is appropriate to require the Companies to model 1.5% EE savings and develop a plan to achieve this assumption.

29. It is appropriate for the Companies' next Carbon Plan to include a plan for increasing BTM solar adoption, including, but not limited to, a program for commercial and industrial customers that allows them to contract directly with new renewable energy projects.

30. Duke shall undertake several actions to improve its transmission planning. First, Duke should develop a coordinated, portfolio-based transmission plan with the NCTPC. Second, Duke should use Generator Replacement Requests to recycle existing interconnection facilities by placing new generation on the site of decommissioned generation. Third, Duke should use Surplus Interconnection Service as an additional method to mitigate against transmission challenges.

EVIDENCE AND CONCLUSIONS FOR FINDINGS OF FACT NOS. 1–5
Selection of Near-Term Actions

The evidence supporting these findings and conclusions related to the EnCompass modeling submitted by the Companies is contained in the Company's Carbon Plan filings, the Gabel Associates' "Review of the Duke Carbon Plan and Presentation of a Preferred Portfolio" (the "Gabel Report") submitted by Tech Customers, and the testimonies and exhibits of the Duke witnesses Snider, McMurry, Quinto, and Kalemba, Public Staff witness Thomas, and Tech Customers witness Borgatti and Roumpani.

Discussion

Although Duke's Carbon Plan filing includes four generation portfolios supported by its modeling, Duke has not proposed that the Commission "select" a particular portfolio; instead, Duke has only asked that the Commission endorse a series of specific near-term actions lasting until the 2024 Carbon Plan review. *See* Verified Petition for Approval of Carbon Plan, at 15–17.

The task of selecting a long-term pathway to eliminate carbon reductions is complex and involves a number of significant, decision-impacting matters which remain unresolved. These uncertainties include, among other issues, 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"), and the development of new technology such as advance nuclear reactors. Given the complexity and uncertainty surrounding North Carolina's journey to 2050, it is reasonable at this time to focus on short-term actions. Therefore, the Commission will not select a particular portfolio offered by the Companies.

The Commission agrees with the suggestion of intervenors, such as Tech Customers, to focus on near-term actions to be taken on a "no regrets" basis. Gabel Report, at 47. No party has expressly opposed focusing in this proceeding on a near-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, and (3) avoids commitments that will preclude resource options that may later become available as lower-cost options.

The focus on "no regrets," near-term actions—as opposed to making long-term commitments—is supported both by the statutory text and pragmatic considerations.

First, 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 necessarily includes discretion in determining when selections of certain resources must be made. Indeed, 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 two provisions indicate that General Assembly's intention that the Carbon Plan be revisited and adjusted as events and technologies evolve over time.

Second, the existence of numerous uncertainties counsels against making any unnecessary long-term commitments. Among these uncertainties are: when offshore wind generation will become available; whether and when small modular nuclear reactors will become available; whether and when 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 IRA will reduce the costs of various renewable generation technologies compared to traditional generation technologies. The existence of such uncertainties counsels against making commitments to resources that could be, over the long term, negatively impacted by these myriad factors.

Thus, in selecting near-term actions to achieve the 2030 carbon reduction goals, it is prudent for the Commission to avoid commitment of capital to resources that (a), due to future developments, may not ever be needed and (b) will preclude resource options that may later become available as lower-cost solutions. In practice, this means identifying which actions must be taken now and which steps can—and therefore should—be deferred until later. By avoiding the selection of unnecessary long-term commitments that would foreclose adjustments in the future, the Commission preserves the ability for the plan to evolve.

Conclusion

For the reasons discussed above, the Commission concludes that it is not prudent to select long-term resource portfolios at this time and, instead, the Commission will focus on the selection of near-term actions in furtherance of North Carolina's carbon-reduction goals. In practice, this means that the Commission will

select near-term "no regrets" actions—actions that move the Companies towards accomplishing the carbon reduction goals while simultaneously keeping open the potential to pursue multiple cost-competitive future paths to a carbon-free grid. It is reasonable and appropriate to approve specific short-term actions which are consistent with the achievement of the carbon reduction goals of S.L. 2021-165; which (i) are consistent with a "no regrets" strategy targeting actions; (ii) are generally consistent with the various portfolios presented by the parties; (iii) are not likely to result in actions or expenditures which do not result in benefits to ratepayers; and (iv) preserve optionality with regards to a range of supply-side resources going forward.

EVIDENCE AND CONCLUSIONS FOR FINDINGS OF FACT NO. 6–10
Duke's Modeling

The evidence supporting these findings and conclusions related to the EnCompass modeling submitted by the Companies is contained in the Company's Carbon Plan filings, the Tech Customers' "Review of the Duke Carbon Plan and Presentation of a Preferred Portfolio," and the testimonies and exhibits of the Duke witnesses Snider, McMurry, Quinto, and Kalemba, Public Staff witness Thomas, and Tech Customers witness Roumpani.

Discussion

Duke is seeking affirmation that "the Companies' Carbon Plan modeling is reasonable for planning purposes and presents a reasonable plan for achieving HB 951's authorized CO2 emissions reductions targets in a manner consistent with HB 951's requirements and prudent utility planning[.]" Verified Petition for Approval of Carbon Plan, at 15.

There is nothing in HB 951 that obligates the Commission to approve Duke's modeling or to determine that it is reasonable. *See* N.C. Gen. Stat. § 62-110.9. The Commission's objective in this proceeding is to determine a short-term plan that is 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. Whether the particular modeling choices made by Duke or whether its modeling efforts as a whole were "reasonable" is not central to the Commission's task in this proceeding, and therefore the Commission will not make such findings on reasonableness.

In addition to being legally unnecessary, Duke's request that the Commission approve the entirety of its portfolios as "reasonable for planning purposes" is inappropriate based on the record. Specific shortcomings in Duke's modeling precludes the Commission from finding that Duke's modeling is reasonable for long-term planning purposes.

For starters, all non-Duke parties attempting to utilize the model were unable to fully replicate Duke's results. The Gabel Report, and testimony of witnesses Borgatti, Roumpani, and Kimbrough, describe some problems with Duke's modeling. First among these is the fact that no party, apparently including Duke, was able to replicate the exact results presented in Duke's portfolios. 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). The Public Staff noted that it was able to reproduce Duke's results only approximately, and only through 2040. Tr. Vol. 21, p. 369-71 (Public Staff witness Thomas). 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. Tr. Vol. 25, pp. 98-99 (Tech Customers witness Roumpani); Tr. Vol. 25, pp. 411-16 (CPSA witness Hagerty).

- Manual adjustments to coal plant retirement dates. Tr. Vol. 25 p. 101 (Tech Customers witness Roumpani); Tr. Vol. 25, pp. 284-93 (AGO witness Burgess); Tr. Vol. 24, pp. 171-77 (SACE et al. witness Fitch); Tr. Vol. 21, p. 52 (Public Staff witness Thomas).

- Overly restrictive optimization period of 8 years as opposed to a longer period. Tr. Vol. 25, pp. 99-100 (Tech Customers witness Roumpani); Tr. Vol. 21, pp. 52-54 (Public Staff witness Thomas).

- Non-economic replacement of batteries with combustion turbines (CTs). Tr. Vol. 25. p. 102 (Tech Customers witness Roumpani); Tr. Vol. 21, pp. 49-52 (Public Staff witness Thomas).

Additionally, Duke made a number of "hard coded" selections in its modeling that do not reflect economic selection of least cost power generation and are not necessary to maintain reliability. 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 approve Duke's specific modeling choices which have been placed in issue in this proceeding.

Conclusion

For the reasons discussed above, the Commission affirms that Duke's Carbon Plan modeling is reasonable for near-term planning purposes. However, given the Commission's focus on near-term actions and the concerns with Duke's modeling, the Commission declines to affirm that Duke's modeling presents a reasonable plan for achieving HB 951's authorized CO2 emissions reductions targets in a manner consistent with HB 951's requirements and prudent utility planning.

EVIDENCE AND CONCLUSIONS FOR FINDINGS OF FACT NO. 13, 16, 17
Tech Customers' EnCompass Modeling

The evidence supporting these findings and conclusions related to the EnCompass modeling submitted by Tech Customers is contained in the Tech Customers' "Review of the Duke Carbon Plan and Presentation of a Preferred Portfolio," and the testimonies and exhibits of the Duke witnesses Snider, McMurry, Quinto, and Kalemba, Public Staff witness Thomas, and Tech Customers witness Roumpani.

Discussion

Other parties have presented informative EnCompass-modeled portfolios, including the Tech Customers' Preferred Portfolio developed by Gabel Associates. Without necessarily concurring with all of the assumptions and other discrete modeling choices made by Tech Customers, the Commission believes that Tech Customers modeling efforts and Preferred Portfolio provide useful information and context for the Commission to develop a short-term action plan in this proceeding.

In developing the Preferred Portfolio, Gabel Associates and Strategen started with the EnCompass model inputs and outputs provided by Duke. Gabel and Strategen then modified the inputs, including the following adjustments: (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. Gabel Report at 5-9, 48; Tr. Vol. 25, pp. 45-46.

As emphasized by Tech Customers, the Preferred Portfolio provides a resource plan in which immediate new natural gas is not necessary. *E.g.*, Gabel

Report, at 6, 8; Tr. Vol. 25, p. 46 (Tech Customers witness Borgatti). Tech Customers point out that the Preferred Portfolio, which manually excludes the selection of combined cycle resources, resulted in a lower NPVRR and lower emissions compared to Duke's Portfolio 1, which is the only Duke portfolio that achieves the state's energy policy objective. Tr. Vol. 25, p. 46 (Tech Customers witness Borgatti).

The Commission notes that Duke offered various criticisms of the Preferred Portfolio. However, the criticisms do not fully withstand close scrutiny. Tech Customers' witnesses and Duke's witnesses addressed several of Duke's concerns in their testimonies:

- **Not biased against gas resources.** Duke mistakenly mischaracterized the Preferred Portfolio as being biased against gas. Tr. Vol. 7, p. 377 (Duke witness Snider). 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. Tr. Vol. 10, p. 78) (Duke witness Snider). And although the Preferred Portfolio forces out CCs, the Public Staff testified that this modeling assumption was not unreasonable as a means of accounting for the risks posed by natural gas supply. Tr. Vol. 22, pp. 312-13 (Public Staff witness Thomas).

- **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. Tr. Vol. 7, pp. 386-87 (Duke witness Snider). 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. Tr. Vol. 10, pp. 129-31 (Duke witness Snider).

- **Coal retirement**. Although Duke's pre-filed testimony criticized the Preferred Portfolio for aggressively retiring of without "meaningfully engag[ing]" with the associated transmission challenges, Tr. Vol. 16, pp. 99-100 (Duke witness Roberts), under cross-examination Duke admitted that Gabel Associates' proposed retirement schedule accounted for all of the transmission challenges for which Duke itself had cautioned. Tr. Vol. 16, pp. 218-22 (Duke witness Roberts).

- **Energy Efficiency forecast.** Duke criticized Gabel Associates for developing EE levels based on the American Council for an Energy Efficient Economy. Tr. Vol. 13, pp. 24-25 (Duke witness Duff). 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*. Tr. Vol. 14, pp. 25-27 (Duke witness Duff). (Notably, Commissioner McKissick asked Duke to provide a late filed exhibit of a roadmap for achieving 1.5% EE savings. Tr. Vol. 14, pp. 73-82.) 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. Tr. Vol. 25, pp. 95-96 (Tech Customers witness Roumpani).

- **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. Tr. Vol. 7, p. 202 (Duke witness Snider). As the Public Staff testified, nobody had access to SERVM and nobody could replicate the analysis or verify the results. Tr. Vol. 21, pp. 373-74 (Public Staff witness Thomas). 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. Tr. Vol. 25, pp. 90-91 (Tech Customers witness Roumpani). With the sensitivity, the Preferred Portfolio still produced a cheaper resource plan with lower carbon emissions that Duke's Portfolio 1. 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.

Conclusion

Without necessarily concurring with all of the assumptions and other discrete modeling choices made by Tech Customers, the Commission finds that Tech Customers' Preferred Portfolio, as supported by its subsequent sensitivity analyses, is reasonable for short-term planning purposes.

EVIDENCE AND CONCLUSIONS FOR FINDINGS OF FACT NO. 18
Purchased Power as a Least-Cost Resource

The evidence supporting these findings and conclusions related to the selection of power purchase agreements is contained in the Company's Carbon Plan filings, the Tech Customers' "Review of the Duke Carbon Plan and

Presentation of a Preferred Portfolio," and the testimonies and exhibits of the Duke witnesses Snider, McMurry, Quinto, and Kalemba, and Public Staff witness Thomas.

Discussion

The Commission's objective in this proceeding is to develop a plan that is compliant with current law and practice for least cost planning for generation to achieve the least cost path to achieve the 2030 and 2050 carbon reduction goals. *See* N.C.G.S. § 62-110.9. As noted by the Public Staff, purchased power has the potential to lower both the costs and the risks of the Carbon Plan. Tr. Vol. 21, p. 78 (Public Staff witness Thomas). Duke's analysis in the Carbon Plan, however, was mostly limited to modeling existing PPAs in specific scenarios, and Duke did not consider a broader use of purchased power as a least-cost resource. A review of the current law and practice of least cost planning, coupled with Duke's own use of power purchases, leads to a conclusion that purchased power should and must be considered as a least-cost resource in the Carbon Plan.

Current law and practice

HB 951 mandated that, in developing a Carbon Plan, the Commission must adhere to the current law and practice of least cost planning, and the current law and practice of least cost planning includes the consideration of purchase power.

Section 62-110.9 provides in pertinent part that:

[T]he Utilities Commission shall:

* * *

> (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 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 . . . .

As the Commission recently clarified, in this proceeding it is "not abdicating its responsibility[y] to ensure that . . . [proposed] facilities meet the least cost mandate." *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).

From a legal perspective, 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). In addition, the General Assembly has mandated that, prior to approval of any new generation asset, the Commission must consider "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." N.C. Gen. Stat. § 62-110.1(d). In furtherance of Section 62-110.1(d), the Commission enacted rules that require 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).

Consistent with the law, the Commission's current practice with respect to least cost planning for generation requires the consideration of purchased power. *See* N.C.U.C. Rule R8-60(d) (requiring an analysis of "the potential benefits of soliciting proposals from wholesale power suppliers and power marketers to supply it with needed capacity"). Rule R8-60(d) is consistent with the Commission's established practice with respect to least cost planning.

For example, in 2012, as part of the Duke-Progress merger, Duke agreed to Regulatory Condition 3.5, which obligates the Companies to "pursue *least cost* integrated resource planning" and "determine the appropriate self-built *or purchased power resources* to be used to provide future generating capacity and energy . . . on the basis of the benefits and costs of such siting and resources[.]"[2] In light of the plain language of Regulatory Condition No. 3.5, Duke is obligated to pursue least-cost resource planning, including consideration of purchased power. Even the Companies' Carbon Plan submission recognizes that purchased power

[2] Order Approving Merger Subject to Regulatory Conditions and Cost of Conduct, Docket Nos. E-2, Sub 998, E-7, Sub 986 (N.C.U.C. June 29, 2012), as amended by Order Approving Merger Subject to Regulatory Conditions and Code of Conduct, Docket Nos. E-2, Sub 1095, E-7, Sub 110, G-9, Sub 682 (N.C.U.C. Sept. 29, 2016). Regulatory Condition 3.5 reads in its entirety: "Least Cost Integrated Resource Planning and Resource Adequacy. DEC and PEC shall each retain the obligation to pursue least cost integrated resource planning for their respective Retail Native Load Customers and remain responsible for their own resource adequacy subject to Commission oversight in accordance with North Carolina law. DEC and PEC shall determine the appropriate self-built or purchased power resources to be used to provide future generating capacity and energy to their respective Retail Native Load Customers, including the siting considered appropriate for such resources, on the basis of the benefits and costs of such siting and resources to those Retail Native Load Customers.

is a necessary resource to consider in selecting the "lowest-cost resources to meet system load requirements." Carbon Plan, Appendix D, at 1.

Besides the requirements of current Commission practice, Section 62-110.9(2) also explicitly allows the Commission to achieve the authorized reduction goals by selecting "other resources" as long as those resources are "owned" by "the applicable electric public utility." The Commission and the Companies have consistently acknowledged that power purchased by either of the Companies is a "resource"[3,4] that is "owned" by the respective company that has purchased it, and thus purchased power fits squarely within any reasonable interpretation of section 62-110.9(2).

Notably, while section 62-110.9(2) distinguishes "new" generation facilities (which must be owned by the applicable utility) from existing facilities (as to which the statute is silent), it does not distinguish between new and existing "other resources."

In sum, the General Assembly's directive that the Commission continue its current least cost planning practices, viewed in light of its recognition that the Commission may select "other resources" besides "new generating facilities,"

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[3] *E.g.*, R8-60(c) (referring to "supply-side (including . . . firm purchased power arrangements) . . . resources"); Order Accepting Integrated Resource Plans and REPS Compliance Plans, Scheduling Oral Argument, and Requiring Additional Analyses, In re 2018 Biennial Integrated Resource Plans and Related 2018 REPS Compliance Plans, Docket No. E-100, Sub 157, at 91 (Aug. 27, 2019) ("Commission Rule R8-60 (d), (e), (f) and (g) requires the electric utilities to assess the benefits of purchased power solicitations, other alternative supply side resources, potential DSM/EE programs, and a comprehensive set of potential resource options and combinations of resource options."); Order Approving Merger Subject to Regulatory Conditions and Code of Conduct, In the Matter of Duke Energy Corporation and Progress Energy, Inc., to Engage in a Business Combination Transaction and to Address Regulatory Conditions and Codes of Conduct, Docket Nos. E-2, Sub 998, E-7 Sub 986, at pp. 27-28 (June 29, 2012) (referring to "DEC's and PEC's power supply resources, which include the parties' generation as well as their wholesale power purchases").

[4] *E.g.*, Duke Carbon Plan, Appendix D, at 1 (explaining that the Companies' "generation portfolio includes a balanced mix of resources with different operating and fuel characteristics. This mix is designed to reliably provide energy at the lowest reasonable cost to meet the Companies' obligation to serve their customers. DEC- and DEP-owned generation, as well as purchased power, is evaluated on a real-time basis to select and dispatch the lowest-cost resources to meet system load requirements."); DEP 2018 IRP 2020 Annual Report at 88 ("The projected capability of existing resources, including generating units, EE and DSM, renewable resources and purchased power contracts is measured against the total resource need."); DEC 2016 IRP Annual Report at 33 (same).

allows the Commission to make a plan for achieving the State's carbon reduction goals that includes purchased power as one component of the plan.

The Companies' Modeling of Purchased Power

The Commission also takes note of the Companies treatment of purchase power in its own modeling. The Companies' selectively used purchase power arrangements in its plan while rejecting the full potential of such purchases.

First, the Companies have included their Joint Dispatch Agreement ("JDA") as a fundamental component of the system modeled in EnCompass. Carbon Plan, Appendix E, p. 81 In their Carbon Plan submission, the Companies explain that the JDA "provides for combined operational control of DEC's and DEP's respective generating facilities to facilitate the sharing of non-firm economic energy between the two utilities." Carbon Plan, Executive Summary at 2 n.3.

The descriptor "sharing" is not precisely accurate. DEC and DEP do not "share" energy. Rather, the Companies jointly dispatch their generating facilities to meet the load of both utilities; determine after the fact which utility was a net recipient of power for each relevant time period; and then the entity that received more power compensates the other by paying for—i.e., purchasing—the power at cost.

Indeed, when the Companies sought approval of the JDA, the Commission explained the arrangement under the JDA as follows:

> [T]he JDA will allow DEC's and PEC's generation resources to be dispatched as a single system to meet the two utilities' retail and firm wholesale customers' requirements at the lowest reasonable cost. Under the JDA, DEC will act as the joint dispatcher for DEC's and PEC's power supply resources. . . .
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> * * *
>
> [T]he joint dispatcher will direct the dispatch of both DEC's and PEC's power supply resources, which include the parties' generation as well as their wholesale power purchases. In addition, the joint dispatcher will be responsible for making short-term (less than one year) wholesale power purchases and sales on behalf of DEC and PEC. . . .
>
> * * *
>
> [E]ach utility will be responsible for the costs it incurs under its own power purchase contracts. After the fact, it will be determined which utility (over-generating utility) provided energy to the other, how much it supplied to the other utility (undergenerating utility) in a given

> hour, and the amount of the savings. The under-generating utility will compensate the over-generating utility at cost for all its expenses for providing the energy.

Order Approving Merger Subject to Regulatory Conditions and Code of Conduct, In the Matter of Duke Energy Corporation and Progress Energy, Inc., to Engage in a Business Combination Transaction and to Address Regulatory Conditions and Codes of Conduct, Docket Nos. E-2, Sub 998, E-7 Sub 986, at pp. 27-28 (June 29, 2012).

The JDA exists to allow each applicable utility to make use of power that is generated by, and purchased from, generation facilities not "owned" by that entity. If HB 951 prohibited all power arrangements except utility ownership, even this JDA would be legally suspect as it involves an agreement with a third party (albeit an affiliate) for the dispatch of power—including any new generation.

In addition to the JDA, the Companies' portfolios also rely on the continuation of other existing power purchase agreements. Carbon Plan, Appendix E, p. 23 ("The Carbon Plan modeling assumes PPA expiry at the end of the current contract term for these resources . . . ."). If HB 951 prohibited the selection of purchased power, then these existing arrangements would not be permitted and would be subject to termination by the utility—an outcome presumably not envisioned by the General Assembly.

Finally, the Companies' appear to have modeled the purchase of on-shore and offshore wind on a purchased basis. The offshore wind selected in Duke's proposed P1 is modeled based on a generic offshore wind block and not on a site-specific selection because Duke assumes it will have to "partner[]" with "on an offshore project that has already evolved beyond the leasing stage." *See* Carbon Plan, Appendix J, at 6. Similarly, due to the various logistical and siting challenges identified by Duke in its plan, Duke's proposed plan for DEC is reliant on up to 600 MW of on-shore wind "assumed to be sourced from PJM but could also be sourced from Midcontinental Independent System Operator, Electric Reliability Council of Texas, or other jurisdictions with strong wind profiles." *See* Carbon Plan, Appendix J, at 13 (Duke also noting that its model includes a "wheeling charge, which would be required to provide firm supply to the Carolinas"). Given that Duke's own plan is reliant on "wheeling" out-of-market power into the Duke service areas, Duke can hardly now assert that HB 951 precludes such arrangements.

Conclusion

Section 62-110.9(2) instructs the Commission to "[c]omply with current law and practice with respect to the least cost planning for generation." The current law and practice of least cost planning includes the consideration of power purchase agreements as a potential least cost resource. For its next IRP filings required by Commission Rule R8-60(h)(1) in September 2023, as well as in its

2024 Carbon Plan update, Duke should fully incorporate potential power purchases into its modeling and proposals.

EVIDENCE AND CONCLUSIONS FOR FINDINGS OF FACT NOS. 19
Inflation Reduction Act of 2022

The evidence supporting these findings and conclusions related to the Inflation Reduction Act is contained and the testimonies and exhibits of the Duke witnesses Snider, McMurry, Quinto, and Kalemba, Duke's Late Filed Exhibit No. 1, Public Staff witness Thomas, and Tech Customers' witnesses Roumpani and Borgatti.

Discussion

Enacted on August 16, 2022, the Inflation Reduction Act provides incentives for low-carbon and carbon-free generation. The IRA is arguably the most significant climate legislation in United States history. Duke acknowledges that the IRA will make renewable generation assets more cost competitive.[5] *E.g.*, Tr. Vol. 10, p. 46 (Duke witness Snider); Tr. Vol. 27, p. 72 (Duke witness Snider).

However, because of the timing of the passage of the IRA, Duke was not able to thoroughly model the IRA's impacts on the Carbon Plan. For instance, the Companies have not been able to analyze the impacts of the IRA on customer energy efficiency programs, Tr. Vol. 13, pp. 174-75 (Duke witness Duff), or on offshore wind costs, Tr. Vol. 18, p. 83 (Duke witness Repko).

Duke, though, did attempt a preliminary analysis of the impacts of the IRA. The preliminary analysis revealed 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. Duke Late Filed Exhibit No. 1. More specifically, 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. *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).

Given that Duke's proposed Carbon Plan does not consider the impacts of this new law, the Commission is reluctant to make any near-term selections of resources that could be negatively impacted by the implementation of the IRA.

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

Conclusion

The Commission finds that the Inflation Reduction Act of 2022 (IRA) has the potential to substantially decrease the relative future costs of solar, wind, nuclear, and storage technologies. Although Duke submitted a late-filed exhibit of an initial attempt to model the impact of the IRA, Duke was unable to incorporate the full impacts of the IRA in its modeling. As a result of the currently unknown impact of the IRA, the Commission will cautiously approach the selection of any asset that is not favorably impacted by the IRA's incentives. The Commission also directs Duke to include a complete analysis of the IRA incentives in its 2024 Carbon Plan modeling and submissions.

EVIDENCE AND CONCLUSIONS FOR FINDINGS OF FACT NO. 20
Modeling Process for 2024 Carbon Plan

The evidence supporting these findings and conclusions related to the modeling process is contained in the testimonies and exhibits of the Duke witnesses Snider, McMurry, Quinto, and Kalemba, and Public Staff witness Thomas, Tech Customers' witness Roumpani, and NCSEA, *et al.*'s witness Fitch.

Discussion

This was Duke's first attempt at using the EnCompass modeling platform. Duke undertook an admirable effort in trying to make its modeling efforts transparent. However, as with any new endeavor, there were lessons to be learned from Duke's modeling practices and there are improvements to be made for future Carbon Plan proceedings.

As established in the record, intervenors that attempted to access and use Duke's modeling data encountered several challenges.

First, one of the files (the partial units export file) provided to intervenors by Duke from the model user interface was not exported correctly. Tr. Vol. 25, pp. 104-05 (Tech Customers Witness Roumpani). This error resulted in failed runs when attempting to use this file to replicate Duke's results. On June 8, 2022, the Companies posted a corrected data file on its Datasite. *Id.*

Second, after resolving the partial units export error, the capacity expansion plan for investment in resources did not match the results provided in the Companies' portfolios. Tr. Vol. 25, pp. 104-05 (Tech Customers Witness Roumpani). On June 8, 2022, the Companies posted a corrected data file on its Datasite. *Id.*

Third, despite the corrections to data files, differences in the expansion plan remained. No party was able to replicate Duke's outputs based on the input files

that Duke provided. Tr. Vol. 25, p. 101-03 (Tech Customers Witness Roumpani). The Companies conceded that due to time constraints, they did not make any test runs of scenarios on the development server before posting the input files on Datasite.

Fourth, the Companies conducted several steps of the analysis outside of the EnCompass model. Tr. Vol. 25, p. 101-03 (Tech Customers Witness Roumpani). However, when the Carbon Plan was filed, only EnCompass files were provided. The pre- and post-processing steps that the Companies undertook were not documented through workpapers. This resulted in intervenors spending significant time working on assembling and determining how the Companies chose the values stated in their Carbon Plan. Tr. Vol. 25, p. 105 (Tech Customers Witness Roumpani).

Conclusions

In light of the lessons learned, the Commission concludes that improvements to the modeling process for the 2024 Carbon Plan proceeding should be required. First, in consultation with stakeholders, Duke should establish a date certain for providing a functioning and validated model database to intervenors at least ninety days prior to any applicable deadline for intervenor comments and/or testimony. Second, Duke's modeling data should include all components relied on by Duke, including any reliability modeling such as the SERVM module used by Duke in this proceeding to evaluate reliability. Third, Duke should minimize out-of-model steps and calculations to improve transparency and reduce bias and human error, and to clearly document all calculations and assumptions determined outside of the model. Fourth, all work papers supporting the model should be provided with, and at the same time as, the database. Fifth, Duke should establish a more formalized process to ensure timely responses and communications regarding modeling issues.

EVIDENCE AND CONCLUSIONS FOR FINDINGS OF FACT NOS. 23-24
Near-Term Solar Procurement

The evidence supporting these findings and conclusions related to the near-term solar procurement is contained in the Companies' Carbon Plan filing and testimonies and exhibits of the Duke witnesses Snider, McMurry, Quinto, and Kalemba, and Public Staff witness Thomas, and Tech Customers' witness Roumpani.

Discussion

One of the 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. Carbon Plan Chapter 3, Fig. 3-5. 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. Tr. Vol. 25, p. 438–39 (CPS witness Hagerty). Synapse's modeling achieved the 2030 goal by adding 7.2 GW of solar by 2030. Tr. Vol. 24, p. 178 (NCSEA *et al.* witness Fitch). The Gabel Report's Preferred Portfolio achieves 2030 compliance by adding similar amounts of solar generation (though with more emphasis on solar paired with storage and behind-the-meter solar generation). Tr. Vol. 25, p. 5 (Tech Customers witness Roumpani). 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. *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). Duke's only portfolio that actually 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 done. Tr. Vol. 25, pp. 335-36 (AGO witness Burgess).

Conclusion

As part of the 2022 Carbon Plan, the Commission selects a procurement schedule through 2030 that would achieve interconnection of at least 5.4 GW of new solar by 2030. This includes an initial procurement of 3,100 MW through 2024. The Commission will revisit solar procurement in the 2024 Carbon Plan proceeding.

EVIDENCE AND CONCLUSIONS FOR FINDINGS OF FACT NOS. 25
Near-Term Natural Gas Generation Procurement

The evidence supporting these findings and conclusions related to the near-term natural gas procurement is contained in the Companies' Carbon Plan filing and testimonies and exhibits of the Duke witnesses Snider, McMurry, Quinto, and Kalemba, and Public Staff witness Thomas.

Discussion

Duke is seeking the selection of 800 MW of CTs and 1,200 MW of CCs. Duke Carbon Plan, Ch. 4 at 14. Several parties ask that the Commission defer the selection of new gas generation until the 2024 Carbon Plan proceeding. *See, e.g.*, Tr. Vol. 24, pp. 158–59 (NCSEA *et al.* witness Fitch); Tr. Vol. 25, pp. 296–98 (AGO witness Burgess); Tr. Vol. 25, p. 50 (Tech Customers witness Borgatti).

The various modeling results indicate that, while new gas generation might be needed to achieve the 2030 carbon reduction goal, such generation will not come online until the late 2020s, if at all. *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. Duke itself 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. Duke Carbon Plan, Ch. 4 at 14.

As explored during the hearing, there are questions as to Duke's proposed construction timeline for these new gas assets. In summary, while Duke assumes it will take up to four years to build the CT units and 5 years to build the CC units, Duke Carbon Plan, Ch. 4, pp. 14-15, industry benchmarks for such construction timelines range from 20–24 months and 32–36 months, respectively. Tech Customers Modeling Panel Cross Exhibits 1 & 2; Tr. Vol. 10, pp. 116-18 (Duke witness Snider). Duke did not provide any substantive justification for why its construction timelines are almost twice as long as the industry benchmarks, particularly when Duke admitted that the new gas plants would be built on brownfield sites, which can expedite the construction of a new CT or CC facility. *E.g.*, Tr. Vol. 10, pp. 125-26.

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, then 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.

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.

Duke already lacks sufficient firm capacity to fuel its existing gas fleet. Duke's 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").."). 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. Duke's Carbon Plan, App. N at 9 (emphasis added).

Although Duke can buy gas for its current fleet, it has no guaranteed pathway for transporting that gas to the plants that need it. *E.g.*, Tr. Vol. 21, p. 74 (Public Staff witness Thomas). Duke attempted to reassure the Commission that

it would be able to supply its gas fleet by purchasing transportation rights at "exorbitant" spot prices—but this falls short of being a guarantee of gas supply. The Commission is also concerned by additional exposure to natural gas volatility in light of the recent bill increase ratepayers experienced because of such fuel-price volatility. Order Approving Fuel Charge Adjustment, Docket No. E-7, Sub 1263, at 8-11 (Aug. 16, 2022).

Duke's solution for securing more fuel transportation for its gas fleet is dependent on the efforts of third parties. First, Duke assumes that the Mountain Valley Pipeline will be completed in the second half of 2023. Tr. Vol. 7, pp. 370-71 (Duke witness Snider). Duke's assumption does not account for the fact that MVP is subject to five different federal lawsuits challenging its permitting. Tr. Vol. 27, pp. 186-87 (Duke witness Snider). Indeed, this summer, MVP asked for and received a four-year extension to its construction timeline. Tr. Vol. 27, p. 188 (Duke witness Snider). 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. Tr. Vol. 27, p. 220 (Duke witness Snider). Duke, however, was not able to provide concrete information about these potential upgrades and admitted that it had not yet taken any steps in furtherance of such projects. Tr. Vol. 27, pp. 220-21, 225-26.

In addition, as parties have 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. *See* Gabel Report at 10, 55; Tr. Vol. 21, pp. 69-70 (Public Staff witness Thomas); Tr. Vol. 24, pp. 158-59 (SACE et al. witness Fitch); Tr. Vol. 24, pp. 271-72 (AGO witness Burgess).

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.

Conclusion

Duke has not established that it is necessary for the Commission, as part of the 2022 Carbon Plan proceeding, to select 800 MW CTs to be constructed before 2028 and 1200 MWs of CCs to constructed before 2029. The Commission will revisit Duke's request for the selection of new gas generation if it Duke renews the request as part of the 2024 Carbon Plan proceeding.

EVIDENCE AND CONCLUSIONS FOR FINDINGS OF FACT NOS. 26-27
Initial Development Activities and Ratemaking Determinations

The evidence supporting these findings and conclusions related to the initial development activities is contained in the Companies' Carbon Plan filing and testimonies and exhibits of the Duke witnesses Snider, McMurry, Quinto, and

Kalemba, Duke witnesses Repko, Immel, Nolan, and Pompee, and Public Staff witnesses Thomas and Metz.

Discussion

In its Verified Petition, the Companies asked the Commission to determine that it is reasonable and prudent to engage in initial project development activities for these projects identified in Table 3 of the Carbon Plan. Verified Petition for Approval of Carbon Plan, at 16. The Companies also asked the Commission to authorize deferral treatment of the initial development costs and determine that such costs would be recoverable even if the projects were ultimately determined not to be necessary to achieve the energy transition. *Id.*

To start, Duke has since withdrawn its request for authorization of deferral of long lead-time resources. 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 49 (Sept. 9, 2022). Therefore, there is no longer a need to consider this request.

In addition, Commission approval of offshore wind, SMR, and pumped hydro development costs appears unnecessary and inappropriate at this time.

Regarding offshore wind, given the length of time before offshore wind is expected to be needed, it is premature to have ratepayers pay for the development of this potential energy resource. Moreover, it appears that Duke's unregulated affiliate and as well as independent power producers (such as Avangrid) will continue to develop wind projects off the coast of North Carolina even in the absence of its selection in this first Carbon Plan. Tr. Vol. 17, p. 134 (Duke witness Repko); *e.g.*, Limited Comments of Avangrid Renewables, LLC, Docket No. E-100, Sub 179 (July 15, 2022). Thus, there seems to be little or no risk to waiting to commit ratepayer resources for the development of offshore wind facilities.

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 appears to be a clear no-regrets choice. In addition, it should be noted that nuclear project development is still 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.

More generally, though, the Commission is reluctant to make determinations regarding whether expenses are reasonable and prudent outside of a general rate case. For example, 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. N.C.

Gen. Stat. § 62-110.7(b). The Companies appear to agree that determination of the reasonableness and prudence of any specific costs in this proceeding would be inappropriate. 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).

In addition, the Commission will also 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.

Conclusion

The Commission denies the Companies' request to determine that it is reasonable and prudent to engage in initial project development activities for these projects identified in Table 3 of the Carbon Plan. The Commission also denies the Companies' request to authorize deferral treatment of the initial development costs and determine that such costs would be recoverable even if the projects were ultimately determined not to be necessary to achieve the energy transition. The Commission will reserve its review and determination of the reasonableness and prudence of the costs of any selected action until the appropriate proceedings established by statutory authority and Commission rules and practices.

EVIDENCE AND CONCLUSIONS FOR FINDINGS OF FACT NOS. 27–28
Energy Efficiency and Customer Programs

The evidence supporting these findings and conclusions related to the energy efficiency and customer programs is contained in the Companies' Carbon Plan filing, the Gabel Report, and testimonies and exhibits of the Duke witnesses Huber and Duff and Tech Customers witness Borgatti.

Discussion

As Duke acknowledges, the first pillar of energy transition and the Carbon Plan process is to "shrink the challenge." Tr. Vol. 13, p.30 (Duke Witness Huber). To elements of shrinking the challenge are energy efficiency and behind-the-meter (BTM) solar generation.

Duke forecasted a 1% load reduction as part of its Carbon Plan modeling. Tr. Vol. 13, p. 31 (Duke witness Huber). Duke, however, has exceeded or achieved nearly a 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. Gabel Report at 37-38; Tr. Vol. 25, pp. 308-09 (AGO witness Burgess). In addition, at the request of the Commission, Tr. Vol. 14, pp. 73-82, tendered a late-filed exhibit that provided a roadmap for achieving 1.5% EE savings. *See* Duke's Late-

Filed Ex. 6. In order to incentivize the Companies to achieve new levels of energy efficiency savings, new targets need to be explored and, eventually, established.

Parties have pointed to the rapid growth in BTM solar that is being achieved in other states like New Jersey and that significant BTM resources contribute to a lower-cost path to meeting the carbon reduction goals. *E.g.*, Gabel Report pp. 42-45. The fact that Duke's solar rebate program is typically fully subscribed for residential and commercial customers suggests that there is significant unmet demand in this area. To unlock commercial and industrial customer BTM activity, the Companies should develop new customer-program offerings. Such offerings should include, for example, permitting customers to contract with new renewable energy projects in North Carolina (or another state) where the participating customer can arrange transmission into the applicable Duke 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.

Energy efficiency and BTM generation are particularly significant because the IRA provides substantial funding that could be used to enhance customer participation. Tr. Vol. 13, pp. 174-75 (Duke witness Duff). Given the momentous task of achieving the Carbon Plan's emission reductions, the Companies should make every effort to leverage the incentives offered by the IRA—including incentives for new EE and BTM programs.

Conclusion

In order to encourage greater enhancements in energy efficiency, it is appropriate to require the Companies to model 1.5% EE savings and develop a plan to achieve this assumption. In addition, it is appropriate for the Companies' next Carbon Plan to include a plan for increasing BTM solar adoption, including, but not limited to, a program for commercial and industrial customers that allows them to contract directly with new renewable energy projects.

EVIDENCE AND CONCLUSIONS FOR FINDINGS OF FACT NOS. 28
Transmission Planning Reform

The evidence supporting these findings and conclusions related to the transmission planning reform is contained in the Companies' Carbon Plan filing, the Gabel Report, and testimonies and exhibits of the Duke witnesses Roberts and Farver, Public Staff witness Metz, and Tech Customers witness Borgatti.

Discussion

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, must 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.

In this proceeding, parties have made a number of helpful suggestions regarding how the transmission planning process can be improved. Among those recommendations, the Gabel Report recommends the development of a coordinated, portfolio-based transmission plan through the NCTPC. Gabel Report pp. 15-17; *see also* Tr. Vol. 25, pp. 448-52 (CPSA witness Hagerty recommending combined transmission and resource planning). Duke also asked that the Companies be directed "to continue to study future transmission needs to reliably implement the Carbon Plan through the NCTPC and other appropriate forums." Petition, Request for Relief No. 5. The Commission agrees that Duke should develop a coordinated, portfolio-based transmission plan with the NCTPC. *E.g.*, Gabel Report at 17; Tr. Vol. 25, p. 67 (Tech Customers witness Borgatti).

Duke also identified the use of Generator Replacement Requests to expedite the addition of new resources without the usual challenges of transmission upgrades. Tr. Vol. 16, p.51 (Duke witnesses Roberts and Farver). The adoption of Generator Replacement Requests was supported by other parties to the proceeding, including the Public Staff, Tr. Vol. 21, p. 152–53 (Public Staff witness Metz), and Tech Customers, Gabel Report at 5; Tr. Vol. 25, p. 66 (Tech Customers witness Borgatti). Duke should use Generator Replacement Requests to recycle existing interconnection facilities" by placing new generation on the site of decommissioned generation.

Tech Customers also introduced the concept of Surplus Interconnection Service as an additional method to mitigate against transmission challenges. *See* Gabel Report at 34; Tr. Vol. 25, p. 68 (Tech Customers witness Borgatti). According to the Gabel Report, the Surplus Interconnection Service occurs outside the conventional transmission queue process and takes about 255 days to complete, connecting additional renewable resources without requiring the time and investment of traditional interconnection processes. Gabel Report at 34; *see* Tr. Vol. 25, p. 126-28 (Tech Customers witness Borgatti). Notably, the Public Staff "encourage[d] Duke to carefully evaluate generator replacements." Tr. Vol. 21, p. 152 (Public Staff witness Metz). The Public Staff also acknowledge 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. Tr. Vol. 21, p. 153 (Public Staff witness Metz). The Public Staff recommend that "Duke should address whether there are cost savings that could be achieved via the Surplus Interconnection process." Tr. Vol. 21, p. 153 (Public Staff witness Metz).

Conclusion

Duke shall undertake several actions to improve its transmission planning. First, Duke should develop a coordinated, portfolio-based transmission plan with the NCTPC. Second, Duke should use Generator Replacement Requests to recycle existing interconnection facilities by placing new generation on the site of decommissioned generation. Third, Duke should use Surplus Interconnection Service as an additional method to mitigate against transmission challenges.

IT IS, THEREFORE, ORDERED as follows:

1. The Commission affirms that Duke's Carbon Plan modeling is reasonable for short-term planning purposes. However, given the Commission's focus on short-term actions and the concerns with Duke's modeling, the Commission declines to affirm that Duke's modeling presents a reasonable plan for achieving HB 951's authorized CO2 emissions reductions targets in a manner consistent with HB 951's requirements and prudent utility planning.

2. The Commission finds that Tech Customers' Preferred Portfolio, as supported by its subsequent sensitivity analyses, is reasonable for short-term planning purposes.

3. For its next IRP filings required by Commission Rule R8-60(h)(1) in September 2023, as well as in its 2024 Carbon Plan update, Duke is directed to fully incorporate potential power purchases into its modeling and proposals.

4. Duke will include a complete analysis of the IRA incentives in its 2024 Carbon Plan modeling and submissions.

5. For the 2024 Carbon Plan proceeding, Duke will take the following modeling actions:

    a. In consultation with stakeholders, Duke should establish a date certain for providing a functioning and validated model database to intervenors at least ninety days prior to any applicable deadline for intervenor comments and/or testimony.

    b. Duke's modeling data should include all components relied on by Duke, including any reliability modeling.

    c. Duke should minimize out-of-model steps and calculations to improve transparency and reduce bias and human error, and to clearly document all calculations and assumptions determined outside of the model.

d. All work papers supporting the model should be provided with, and at the same time as, the database.

e. Duke should establish a more formalized process to ensure timely responses and communications regarding modeling issues.

6. The Commission selects a procurement schedule through 2030 that would achieve interconnection of at least 5.4 GW of new solar by 2030. This selection includes an initial procurement of 3,100 MW through 2024.

7. Duke's request for the selection of 800 MW CTs and 1200 MWs of CCs is denied, without prejudice to be renewed in a later proceeding.

8. The Commission denies the Companies' request that the Commission determine that it is reasonable and prudent to engage in initial project development activities for these projects identified in Table 3 of the Carbon Plan.

9. The Commission reserves its review and determination of the reasonableness and prudence of the costs of any selected action until the appropriate proceedings established by statutory authority and Commission rules and practices.

10. The Commission denies the Companies' request that the Commission authorize deferral treatment of the initial development costs.

11. The Commission denies the Companies' request that the Commission determine that such costs would be recoverable even if the projects were ultimately determined not to be necessary to achieve the energy transition.

12. For the 2024 Carbon Plan, the Companies are directed to model 1.5% EE savings and develop a plan to achieve this assumption. In addition the Companies are directed to include a plan for increasing BTM solar adoption, including, but not limited to, a program for commercial and industrial customers that allows them to contract directly with new renewable energy projects.

This ____ day of December, 2022.

NORTH CAROLINA UTILITIES COMMISSION

Certificate of Service

I hereby certify that a copy of the foregoing *Partial Proposed Order of the Tech Customers* has been served this day upon counsel for all parties of record in this proceeding by electronic mail.

This the 24th day of October, 2022.

BROOKS, PIERCE, MCLENDON,
HUMPHREY & LEONARD, LLP

/s/ Craig D. Schauer