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May 28, 2024

**Via Electronic Filing**

Ms. A. Shonta Dunston
Chief Clerk
North Carolina Utilities Commission
4325 Mail Service Center
Raleigh, North Carolina 27699-4300

**RE: Duke Energy Progress, LLC and Duke Energy Carolinas, LLC's Biennial Consolidated Carbon Plan and Integrated Resource Plan, Docket No. E-100, Sub 190**

Dear Ms. Dunston:

Attached for filing on behalf of Tract Capital Management, LP in the above-referenced docket is the Pre-Filed Direct Testimony of Ronald J. Moe.

By copy of this letter, I am forwarding a copy of the attached testimony to all parties of record by electronic delivery.

Very truly yours,

*/s/ Daniel R. Simon*

Daniel R. Simon

DRS:DRS
Attachment

cc: Parties of Record

**BEFORE THE**

**NORTH CAROLINA UTILITIES COMMISSION**

**IN THE MATTER OF**
**BIENNIAL CONSOLIDATED CARBON PLAN AND INTEGRATED RESOURCE PLANS OF**
**DUKE ENERGY CAROLINAS, LLC AND DUKE ENERGY PROGRESS, LLC**

**DOCKET NO. E-100, Sub 190**

**PRE-FILED DIRECT TESTIMONY**

**OF**

**RONALD J. MOE**

**ON BEHALF OF**

**TRACT CAPITAL MANAGEMENT, LP**

**MAY 28, 2024**

**INTRODUCTION**

**Q. PLEASE STATE YOUR NAME, TITLE, AND BUSINESS ADDRESS.**

A. My name is Ronald J. Moe. I am a Vice President of Energy and Infrastructure Consulting at Leidos Engineering, LLC ("Leidos") and Leader of Leidos' Utility Consulting Practice. Leidos is a Delaware limited liability company that was formed on September 18, 2013. My business address is 1699 SE Camano Drive, Camano Island, Washington 98282.

**Q. PLEASE DESCRIBE YOUR EDUCATION AND PROFESSIONAL EXPERIENCE.**

A. I obtained an M.A. degree in Economics from the University of Washington in Seattle, Washington in 1982 and a B.A. in Economics from the same university in 1980. I have been an economic consultant to the U.S. and global electric power and energy industries for 41 years and have held a variety of consulting management positions during most of that period.

Prior to joining Leidos, I led the consulting practice for two years at Ventyx (now part of Hitachi Energy), which provides market consulting and resource planning services to utilities and other participants in the global electric power industry; led the electric power market consulting and utility resource planning practice for five years at R. W. Beck, a predecessor company to Leidos; led similar practices at Jacobs Consultancy for two years and Stone & Webster Management Consultants (now Lummus Consultants) for five years; and led the Utility Demand Side Management Program Evaluation practice at Synergic Resources Corp. (now part of Guidehouse) for four years.

**Q. PLEASE SUMMARIZE YOUR RESPONSIBILITIES AT LEIDOS.**

A. Between 2011 and 2021, I co-led the Power Transactions practice, which provides independent engineering, market consulting, and related services in support of development, financing, purchase, sale, and restructuring of electric power assets and companies around the world. Since the beginning of 2022 I have led the Utility Consulting practice, which provides resource planning and carbon reduction strategy services to U.S. electric utilities and supports the sale and purchase of electric and natural gas utilities.

**Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?**

A. No.

**Q. ON WHOSE BEHALF ARE YOU TESTIFYING?**

A. I am testifying on behalf of Tract Capital Management, LP ("Tract"), a data center land acquisition and development company.

**Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

A. The purpose of my testimony is to comment on the load forecasts that Duke Energy Carolinas, LLC and Duke Energy Progress, LLC (the "Companies") developed for and used in the 2023-2024 Carbon Plan and Integrated Resource Plan ("CPIRP") and make recommendations to the North Carolina Utilities Commission (the "Commission") related to the load forecasts.

**Q. WHAT IS TRACT'S INTEREST IN THIS PROCEEDING?**

A. Tract is a master planner of data center parks with expertise in designing and developing sites to accommodate large, fast-growing electric loads. Tract has communicated to the Companies its desire and intention, assuming the Companies can supply the required electricity, to develop 1) a data center park with a 500 megawatt ("MW") load by 2032 in the Companies' North Carolina service territories; and 2) additional, larger data center parks soon thereafter, also within the Companies' North Carolina service territories. Assuming the Companies can supply the required electricity, Tract expects to develop data center parks in the Companies' North Carolina service territories with loads totaling 2,500 MW by the mid-2030s. These loads have very high load factors (i.e., 100 percent except during very infrequent scheduled maintenance outages) and require very high reliability. Tract is aware that companies similar to it also intend to develop data centers with large loads within the Companies' North Carolina service territories. Tract's interest in this proceeding stems from its concern that the Companies may not have sufficient generating capacity to satisfy the future power demands of Tract and other data center developers.

**Q. IN BRIEF, WHAT ARE YOUR CONCLUSIONS RELATED TO THE LOAD FORECASTS?**

A. My conclusions are:

1. The Companies' 2023 Fall Base Case Load Forecast provided in the Supplemental Planning Analysis ("SPA") filed with the Commission on January 31, 2024 likely was too low at the time it was prepared in the Fall of 2023 as well as when it was filed, given the information the Companies had in their possession at those two points in time about Large Site Developments. As a result, the

Portfolios the Companies developed using this forecast likely did not include enough net capacity additions.

2. The Companies' "Continued Economic Development" 2023 Fall High Load Forecast provided in the SPA likely was too low to serve as a high or upper bound forecast at the time it was prepared as well as when it was filed, again given the information the Companies had in their possession at those two points in time about Large Site Developments. However, at those two points in time it was likely nearer a true base case forecast than the 2023 Fall Base Case Forecast was. The Portfolio the Companies developed using this forecast likely is the only one the Companies filed that can satisfy the actual loads that will occur.

**Q. IN BRIEF, WHAT ARE YOUR RECOMMENDATIONS RELATED TO THE LOAD FORECASTS?**

A. I have three recommendations to the Commission:

1. For this proceeding, only approve a Portfolio that utilizes the Continued Economic Development 2023 Fall High Load Case. I recognize that the only Portfolio the Companies filed using that load forecast does not meet the Interim Target of 70 percent carbon dioxide ("$CO_2$") reductions until 2037, which may not be satisfactory to the Commission. The Commission therefore may need to order the Companies to develop one or more alternative Portfolios that both utilize the Continued Economic Development 2023 Fall High Load Case and meet the Interim Target at an earlier date specified by the Commission. My point is that

Portfolios developed using a different load forecast are likely to not satisfy actual future loads.

2. Order the Companies to improve the methodology they use to forecast loads associated with Large Site Developments using all of the information they have in their possession about such developments so that the resulting forecasts are not obviously too low at the time they are prepared.

3. Order the Companies to prepare and file with the Commission a mid-cycle CPIRP Update on or before March 31, 2025 that both incorporates the load forecast improvement(s) developed in response to (2) above and achieves the Interim Target by a date specified by the Commission.

**Q: WHAT GENERAL METHODOLOGY DID THE COMPANIES EMPLOY TO DEVELOP THE LOAD FORECASTS USED IN THE 2023-2024 CPIRP?**

A. I have reviewed the load forecast sections of all of the Integrated Resource Plans ("IRPs") and IRP Updates the Companies have filed with the Commission starting with the 2014 IRP, the Initial Carbon Plan the Companies filed with the Commission in 2022 ("CP"), and the 2022 IRP Update the Companies filed with the Public Service Commission of South Carolina ("PSCSC"). The load forecasts in all of these plans were developed using the same general methodology. Prior to the filing of the 2020 IRP and continuing to the present, the forecast of retail loads was developed solely using econometric models of the individual customer classes. Starting with the filing of the 2020 IRP and continuing to the present, the Companies developed forecasts outside the econometric models of 1) electric vehicle ("EV") incremental loads and 2) the load reductions attributable to the installation by customers of rooftop solar resources and added/subtracted these separate forecasts to/from the forecasts derived using the econometric models. Starting with the CP and PSCSC IRP Update filings in 2022 and continuing to the present, the Companies forecast the impacts of their Critical Peak Pricing program on peak loads and subtracted these impacts from the forecasts derived using the econometric models. In the 2023-2024 CPIRP filing, the Companies for the first time developed a forecast outside the econometric models of loads for Large Site Developments and added these separate forecasts to the forecasts derived from the econometric models.[1]

**Q. HOW DOES THE COMPANIES' METHODOLOGY COMPARE TO THE METHODOLOGY USED BY PEER COMPANIES?**

A. The methodology the Companies used is typical of the methodologies used by large investor-owned electric utilities throughout the United States. This is true of both the econometric approach the Companies used their adjustment of the load forecasts developed using the econometric models with information derived outside the econometric models about future load increments and decrements associated with EVs, rooftop solar, and large site developments is commonplace among utilities similar to the Companies. Moreover, with the one exception described below, the Companies executed the methodology as well

[1] The description of the evolution of the load forecasting methodology in the preceding sentences is based on a review of the publicly available documents associated with the various filings. The description is erroneous to the extent that the Companies executed variations in the methodology that they did not describe in those documents. In particular, the Companies may have adjusted the forecasts derived using the econometric models to reflect Large Site Developments prior to the 2023-2024 CPIRP filing, but the publicly available documents do not reflect that.

as or better than any of their peers whose load forecasts I have reviewed, and I have no criticism of either their methodology or the resulting forecasts.

**A. WHAT IS THE EXCEPTION?**

Q. Having said that, although it was appropriate for the Companies to adjust the load forecast developed using the econometric models for Large Site Developments in the 2023-2024 CPIRP, their implementation of this adjustment was problematic, because the Companies assumed that only the loads of a small subset of projects that satisfied particular criteria the Companies established needed to be added to the forecast derived using econometric methods, and that the loads of the larger set of projects that did not meet those criteria could be ignored. Based only on the information the Companies had in their possession at the time, the Companies should have known that this approach would result in a forecast that was too low.

**Q. HOW DID THE COMPANIES QUANTIFY THE LARGE SITE DEVELOPMENT LOADS?**

A. The process the Companies used to quantify the adjustments to include in the 2023 Spring Forecast that was utilized in the initial 2023-2024 CPIRP filing is summarized in four excerpts from the Companies filings in this docket:[2]

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[2] First two from August 17, 2024 filing, Appendix D, Electric Load Forecast, p. 14; the third from p.5 of the Supplemental Direct Testimony of Glen A. Snider on Behalf of Duke Energy Carolinas, LLC and Duke Energy Progress, LLC on November 30, 2023; the fourth from p.15 of Supplemental Planning Analysis filed on January 31, 2024.

1. The Companies' Economic Development teams and Large Account Management teams continually devote resources toward tracking and engaging with a series of potential development projects at various stages of consideration or buildout, with many of these submitted for consideration to the load forecasting team. Ultimately, the team elevated several of these projects — ones that were of large magnitude, (the largest often are referred to as "mega-projects") and with plans sufficiently advanced such that the demand could be anticipated with a high degree of *certainty* — into a *rarified* group that were used to adjust the load forecast beyond what would have occurred only based on the calculations from the economic and other independent predictors. (Italics added for emphasis.)

2. To mitigate the impact of a possible "double count," the load forecasting team typically adjusts the load forecast by a reduced amount of the full load expectation for each project; this consideration results in a discount of 30%–60%, depending on the extent to which informal statistical calculation suggests that aggregate sales are explained by the relevant economic indicator for that customer class.

3. The new economic development projects included in the Updated 2023 Fall Load Forecast are those that, at a minimum, have (1) executed an agreement indicating an intention to obtain service from the Companies or are in an advanced stage of engagement with the Companies for the same, and (2) demonstrated other indicia of material development

activities with respect to the location in question (*e.g.*, obtaining site control, initiation of rezoning activities, *etc.*).

4. The methodology used to capture large site development activity relied on two major strategies: a focus on projects with letter agreements or in the very late stages of development *[Footnote in text: G. Snider Supp. Direct Testimony at 5 (describing material commitments as: (1) executed an agreement indicating an intention to obtain service from the Companies or are in an advanced stage of engagement with the Companies for the same, and (2) demonstrated other indicia of material development activities with respect to the location in question (e.g., obtaining site control, initiation of rezoning activities, etc.).]* and adjusting those projects to avoid overlap with other economic growth predicted by macroeconomic drivers in the load forecast estimation equations. The Companies' load forecasting process recognizes that site selection processes are often very competitive for both potential customers and the regions they are considering and, therefore, endeavor to include only the most mature and committed projects into the base load forecast. This same methodology was again applied with available data through early October 2023 for input into the development of the Updated 2023 Fall Load Forecast used for this Supplemental Planning Analysis.

**Q. WHAT ARE YOUR COMMENTS ON THE COMPANIES' APPROACH TO QUANTIFYING THE LARGE SITE DEVELOPMENT LOADS IN THE 2023 SPRING LOAD FORECAST?**

I first want to emphasize that I am sympathetic to the predicament the Companies faced early in 2023 as they developed the 2023 Spring Load Forecast. A material number of sponsors of Large Site Developments held discussions with representatives of the Companies during the preceding year(s) about interconnecting large loads to the Companies' system in the coming years. None of the Companies' prior IRP filings going back to 2014 mention a phenomenon similar to this, which suggests (though does not definitively indicate) that the Companies had not experienced the phenomenon of a material number of such discussions in recent history. As a result, the Companies had no recent history specific to them about the likely success rates of these various Large Site Developments, and thus no ability to develop experience-based probability (of success)-weighted expected values of incremental loads that were not already captured in the forecasts derived using the econometric models by the forecasts of future economic activity.

Without such information, it appears that the Companies determined that the most defensible approach to estimating these incremental loads was to select a small number of projects with, as the first excerpt above states, "plans sufficiently advanced such that the demand could be anticipated with a high degree of *certainty* — into a *rarified* group" and that the third excerpt above states had "(1) executed an agreement indicating an intention to obtain service from the Companies or are in an advanced stage of engagement with the

Companies for the same, and (2) demonstrated other indicia of material development activities with respect to the location in question." In implementing this approach, the Companies essentially assumed that 1) all of the other projects whose sponsors had held discussions with representatives of the Companies would result in zero incremental loads over and above what was already captured in the forecasts derived using econometric models; and, 2) as indicated in the second excerpt above, that either 30-60 percent of the projected load attributable to the selected projects would not actually materialize or that that quantity was already reflected in the load forecasts derived from the econometric models.

Judged based only on the information the Companies were known to have at the time, and not with the benefit of hindsight, that assumption was untenable. As a result, the 2023 Spring Load Forecast was too low even at the time it was prepared, given only the information the Companies had in their possession at the time. The Companies had to have known at that time that excluding all of the load of the projects that were not included in the rarified group and 30-60 percent of the load of the projects that were in the rarified group would result in a load forecast that was too low.

Even with the information now available (i.e., with the benefit of hindsight just for the purpose of this paragraph), it is not clear what alternative assumption could have been made then that would have been immune to criticism, which is why I am sympathetic to the Companies' predicament. However, with the benefit of hindsight, in the initial August 17, 2023 filing, the Companies at the very least should have 1) discussed the possible forecast error, for example by providing a table summarizing the loads of all of the projects from which the eight projects were selected; and 2) included a sensitivity case with relaxed selection criteria so that the selected group was not as rarified, as they did in the Continued Economic Development sensitivity in the Supplemental Planning Analysis filed on January 31, 2024.

The Companies should be applauded for notifying the Commission of the large increase in forecast loads between the 2023 Spring and 2023 Fall Load Forecasts, developing and filing new Portfolios based on the 2023 Fall Load Forecast in a timely manner, and developing and including in the January 31, 2024 filing the Continued Economic Development 2023 Fall High Load Forecast and a Portfolio based on that forecast. However, having just been surprised by the magnitude of the under-forecast of Large Site Development loads in the 2023 Spring Load Forecast, it is difficult to believe that the Companies decided, according to the last sentence of the fourth excerpt above, to use the same methodology and selection criteria, albeit applied to updated information, to quantify Large Site Development loads in the 2023 Fall Load Forecast.

**Q. HOW DID THE COMPANIES QUANTIFY THE LARGE SITE DEVELOPMENT LOADS IN THE 2023 FALL LOAD FORECAST?**

A. Using the methodology described above, the Companies forecast 1,351 MW of combined non-coincident winter peak and 8,756 gigawatt hours ("GWh") of energy Large Site Development loads in 2033 that were included in the 2023 Spring Load Forecast, which constituted 3.8 and 4.8 percent, respectively, of the total forecast combined non-coincident winter peak and energy load in that year.[3] In developing the 2023 Fall Load Forecast, they used the same methodology to forecast 3,044 MW of combined non-coincident winter peak and 24,741 GWh of energy Large Site Development loads in 2033, which constituted 8.1 and 12.0 percent, respectively, of the total forecast combined non-coincident winter peak and energy load in that year.[4] Between the 2023 Spring and 2023 Fall Load Forecasts, the forecast of 2033 Large Site Development combined non-coincident winter peak loads increased 1,693 MW (125 percent), and the forecast of 2033 Large Site Development energy loads increased 15,985 GWh (183 percent). Importantly, the increases discussed above constituted 4.8 percent and 8.8 percent of the 2023 Spring Load Forecast combined non-coincident winter peak and energy load for 2033.

**Q. WHAT ARE YOUR COMMENTS ON THE COMPANIES' APPROACH TO QUANTIFYING THE LARGE SITE DEVELOPMENT LOADS IN THE 2023 FALL LOAD FORECAST?**

It was appropriate to use the same methodology in the Fall to develop a preliminary estimate of such loads that could be compared on an apples-to-apples basis to the forecast of Large Site Development loads in the 2023 Spring Load Forecast; and to use that comparison to determine if it was necessary to notify the Commission that the Companies would be filing an updated load forecast and the associated Portfolios with the Commission. However, having performed that comparison and determined that such a

[3] August 17, 2024 filing, Appendix D, Electric Load Forecast, tables on pp. 15, 28, and 29.

[4] January 31, 2024 filing, Supplemental Planning Analysis, tables on pp. 16, 21, and 22.

course of action was necessary, the Companies were not required to continue to use that methodology to develop the 2023 Fall Load Forecast as the one they used to develop the 2023 Spring Load Forecast, which they had just determined required adjustments in 2033 of 125 percent to the combined non-coincident winter peak and 183 percent to energy.

Moreover, in preparing the 2023 Fall Load Forecast the Companies had information that they did not have when they prepared the 2023 Spring Load Forecast: information about the 27 projects that, using the Spring methodology, were deemed worthy of inclusion in the rarified group in the Fall but not in the Spring. The Companies could have analyzed that information, in particular to identify characteristics that were shared by most or all of those 27 projects and few or none of the other projects for which information was available in both the Spring and Fall but that were not included in the rarified group in either forecast. The results of such an analysis could have been applied to information available in the Fall to identify projects that 1) would not have been selected using the 2023 Spring methodology, but 2) with non-zero probability would be expected to be selected in the subsequent update (e.g., 2024 Spring) using the 2023 Spring methodology. The Companies could have then modified the 2023 Spring methodology for use in the 2023 Fall Load Forecast to include, at least on a probabilistic basis, these additional projects. Having not done that or a similar analysis and having not modified the 2023 Spring methodology to reflect the additional information the Companies have in their possession, the Companies should have known at the time this forecast was prepared that it was too low. Moreover, as long as both 1) the Companies continue to use the approach described above and 2) the Companies' territories continue to attract large site developments, the

Large Site Development load adjustments in each forecast will be materially higher than in the prior forecast.

Finally, as noted in the Supplemental Direct Testimony of Glen A. Snider,[5] at the time the Supplemental Planning Analysis was filed, the Companies were aware that two other large investor-owned electric utilities in the southeastern United States, Georgia Power Company ("GPC") and Dominion Energy Virginia, were both incorporating material increases in peak demand forecasts between their respective 2022 IRPs and 2023 IRP updates. The 2023 Dominion forecast included a 4.0 percent summer peak cumulative average growth rate ("CAGR") from 2023 to 2038, double the 2.0 percent CAGR included in the 2022 forecast for the 2022-2037 period.[6] According to the 2023 GPC IRP update,[7] the company expects 6,600 MW of growth through the winter of 2030/2031 compared to expectations of 400 MW of growth in the 2022 IRP. The near-term load increases were driven primarily by large customer loads such as new data centers and new manufacturing facilities.

**Q. GIVEN THE RANGE OF LOAD FORECASTS THE COMPANIES HAVE PREPARED, WHAT IS THE MOST PLAUSIBLE ONE TO USE AS THE "BASE CASE?"**

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[5] Supplemental Direct Testimony of Glen A. Snider on Behalf of Duke Energy Carolinas, LLC and Duke Energy Progress, LLC on November 30, 2023, page 4.
[6] Dominion Energy Virginia 2023 Integrated Resource Plan, Case No. PUR-2023-00066, (May 1, 2023).
[7] Georgia Power Company's 2023 Integrated Resource Plan Update, Docket No. 55378, (filed Oct. 27, 2023).

A. As I stated above, I applaud the Companies for developing the Continued Economic Development 2023 Fall High Load Forecast and a Portfolio based on that forecast. This forecast includes 1,360 MW of combined non-coincident winter peak and 11,226 GWh of energy Large Site Development load in 2033, over and above the quantities included in the Base 2023 Fall Load Forecast. The Companies do not describe in the Supplemental Planning Analysis filed on January 31, 2024 the methodology or date they used to determine these quantities. I note that these differences are 70-80 percent the size of the differences between the 2023 Spring and Base 2023 Fall Large Site Development load increments. It is impossible to know with confidence without doing the analysis, but it is plausible that the analysis described in the preceding paragraph would yield Large Site Development load increments in the range of 70-80 percent larger than the increments included in the Base 2023 Fall Load Forecast, both relative to the increments included in the 2023 Spring Load Forecast. As such, the Continued Economic Development 2023 Fall High Load Forecast is a more plausible "base case" load forecast than the forecast the Companies labelled "Base 2023 Fall Load Forecast."

**Q. DO YOU HAVE ANY ADDITIONAL COMMENTS?**

A. Yes. I recognize that the Companies needed to "freeze" the input assumptions for the 2023-2024 CPIRP on a particular date in order to comply with the Commission's schedule. Doing so creates the risk that information about changes in the environment obtained subsequent to the freeze date will cause one or more of the input assumptions to be obviously incorrect by the time the Companies filed the CPIRP with the Commission or during the consideration of the CPIRP in this proceeding. From my perspective it is not reasonable to criticize one or more input assumptions, or the approach that was used to develop an those input assumptions, solely based on information that did not become available until after the freeze date, and I have been careful in my answers above to evaluate the Companies' approach to quantifying Large Site Development loads solely based on information that the Companies had or should have had at the time they developed the corresponding assumptions.

Having said that, it would be useful to the Commission to know if any information concerning changes in the external environment has been disclosed since the most recent freezing of input assumptions that would affect my opinions about Large Site Development loads expressed above. I am not aware of any updated load forecasts the Companies have filed with the Commission that may either support or contradict my opinion that the Base 2023 Fall Load Forecast was too low at the time it was prepared.

However, I am aware that the Companies' parent, Duke Energy has reported in three successive Earnings Review and Business Update filings to the U.S. Securities and Exchange Commission increases over time in its forecast of cumulative (relative to 2023) "Projected Load from Economic Development" in 2027 as follows:

- November 2, 2023 filing – 7-9 terrawatt hours ("TWh")
- February 8, 2024 filing – 8-13 TWh
- May 7, 2024 filing – 8-14 TWh

I also note that the May 7, 2024 filing also included a projection of 10-18 TWh for 2028. Finally, it is important to note that these projections are for the entire portfolio of Duke Energy's electric utility subsidiaries, and not just the Companies.

**Q. WHAT ARE YOUR RECOMMENDATIONS TO THE COMMISSION REGARDING THE 2023-2024 CPIRP?**

A. Given that the Base 2023 Fall Load Forecast was too low at the time it was developed and filed and the Continued Economic Development 2023 Fall High Load Forecast was a more plausible base case forecast, the Commission should not approve any Portfolios based on any load forecast other than the Continued Economic Development 2023 Fall High Load Forecast. Portfolios developed using other load forecasts, for example, the Base 2023 Fall Load Forecast, are likely to not be able to satisfy actual loads. If the gap between these two load forecasts only occurred beyond the period addressed in the Near-Term Action Plan ("NTAP"), e.g., after 2034, the Commission could approve a Portfolio based on the Base 2023 Fall Load Forecast (e.g., P3 Fall Base), order the Companies to implement the NTAP based on that Portfolio, and safely postpone addressing the issue until the next CPIRP. However, the gap between the two forecasts of combined non-coincident winter peak load is 852 MW in 2029 and increases to 1,099 MW in 2031 and 1,360 MW in 2033. The NTAP for the P3 Fall Base Portfolio includes numerous activities required to be performed so that particular resources can be online in each of the years 2031-2035, so the NTAP for any Portfolio developed using the Continued Economic Development 2023 Fall High Load Forecast will have different (in particular, more) activities than the NTAP for the P3 Fall Base.

Moreover, the Companies only developed one Portfolio using the Continued Economic Development 2023 Fall High Load Forecast, labelled P3 Fall High Load. This Portfolio fulfills the accelerated load growth in the Continued Economic Development

2023 Fall High Load Forecast by postponing retirement of one coal unit until 2037 and building additional solar, battery, and combined cycle capacity after 2035. Importantly, this Portfolio does not achieve the Interim Target for $CO_2$ reductions until 2037, as opposed to achievement in 2035 or earlier for other Portfolios. To the extent the Commission is only willing to approve a Portfolio that achieves the Interim Target by 2035, then the Companies have not filed a Portfolio that both achieves the Commission's desire for achievement by 2035 of the Interim Target and is likely to be able to satisfy actual loads.

**Q. WHAT ARE YOUR RECOMMENDATIONS TO THE COMMISSION REGARDING LOAD FORECASTING IN FUTURE CPIRPS?**

A. The Commission should order the Companies to improve the methodology they use to forecast loads associated with Large Site Developments. The Companies devote considerable resources to developing the portion of the load forecast that can be addressed using econometric methods, and they utilize a state-of-the-art approach for that portion. Treating load modifiers such as EVs, rooftop solar, and Large Site Developments with less rigor utilizing fewer resources is acceptable when the associated loads are small and/or fairly certain. That is not true when the associated loads have grown as large and are as uncertain as the Companies' Large Site Development loads have; as discussed above, the increase between the 2023 Spring and Base 2023 Fall Load Forecasts constituted 4.8 percent and 8.8 percent of the 2023 Spring Load Forecast combined non-coincident winter peak and energy load for 2033.

I described above an approach I think the Companies could have implemented to improve the forecast of Large Site Development loads for inclusion in the Base 2023 Fall

Load Forecast. The virtue of that approach is that it could have been implemented quickly, utilized only information that the Companies had available to them at the time, and would have yielded a forecast that was not on its face too low even at the time it was developed. That approach is not necessarily the best approach for the Companies to employ going forward, when they will have more time and potentially more information.

One benefit of having more time is that they can learn from what other utilities are doing to address this issue. Dominion Energy Virginia is required to use the load forecast that the PJM Interconnection ("PJM") utilizes in their long-term planning for its DOM zone. PJM isolates data center load in their forecasts and requests a separate data center load forecast from load-serving-entities to add to the base PJM forecast. Beginning with the 2023 forecast, PJM required a 15-year data center forecast rather than a 5-year forecast, which resulted in a higher 2023 PJM forecast. Dominion Energy Virginia has developed its own data center load forecasting methodology which it provides to PJM and incorporates into its long-term planning models and beginning with the 2023 forecast no longer relies on third-party data center forecasts for long-term projections. As part of the stipulation agreement adopted by the Georgia Public Service Commission ("GPSC") approving the 2023 IRP[8], GPC is required to file a quarterly Large Load Economic Development Report with the GPSC to keep the GPSC informed during this period of growth. The Large Load Economic Development Report is based on the GPC forecast that

[8] Georgia Public Service Commission Oder Adopting Stipulated Agreement RE: Georgia Power Company's 2023 Integrated Resource Plan Update, Docket No. 55378, (filed April 26, 2024).

is developed using the company's probabilistic model to evaluate potential economic development loads to create a median load forecast for a range of potential new customers.

**Q. DO YOU HAVE ANY OTHER RECOMMENDATIONS?**

A. The Commission should order the Companies to resume filing mid-cycle (i.e., annual) updates of the CPIRP. Prior to 2020, the Companies filed full IRPs in every even-numbered year and updates in every off-numbered year. Each update considered changes to a limited number of inputs to the process, and the Commission proceeding to approve each update was both quicker and less contentious.

During its consideration of the Companies' 2020 IRP, the Commission relieved the Companies of the requirement to file a 2021 IRP Update so that they could focus their resources on addressing a handful of outstanding issues in the proceeding. Based on the experience of at least the three previous cycles, the Commission's decision was well-justified. The Companies' actual loads did not vary much year-to-year during the 2010's, and the differences between the load forecasts in the full IRPs and the Updates that followed were immaterial. The same was true of both the selected Portfolios and the associated NTAPs.

The current environment, whose key features have been present for the past 2-3 years, is different. Most importantly, load forecasts changed dramatically between forecast vintages. The Companies' forecasts of 2028 combined non-coincident winter peak load increased by 1,420 MW (4.3 percent) between the 2023 Spring and 2023 Fall Load Forecast; on top of a 936 MW increase (2.9 percent) between the CP filed in 2022 and the 2023 Spring Load Forecast. The increases for these two forecast pairs for the 2033 winter peak load forecast are even larger: 2,118 MW (6.0 percent) and 2,252 MW (6.8 percent), respectively. As a result, the selected Portfolios associated with these three forecasts are materially different, as are the ensuing NTAPs.

The key features of the current environment, in particular the pace of changes in forecasts of future loads, is expected to continue for the foreseeable future. The Carolinas in general and North Carolina in particular are a magnet for manufacturing and especially data center loads, and the attraction is unlikely to weaken materially in the near term. Given the increase in the six months between the 2023 Spring and 2023 Fall Load Forecasts of 2,118 MW in the forecast of 2033 combined non-coincident winter peak loads, it would not be shocking if the base case forecast of 2033 combined non-coincident winter peak loads used in the next currently scheduled CPIRP, scheduled to be filed during the summer of 2025 and approved by the end of 2026, is at least 5,000 MW higher than the 2023 Fall Load Forecast. That would constitute a 13 percent increase in the forecast of the 2033 combined non-coincident winter peak load, compared to the 2023 Fall Load Forecast. Dramatic changes to both the selected Portfolio and the associated NTAP would ensue. My view is that the Commission and stakeholders (including but not limited to the Companies' customers) would benefit greatly from the opportunity to consider these changes in smaller increments, for example, in two separate filings, each considering a 2,500 MW increase in 2033 combined non-coincident winter peak loads.

Finally, I note that utilities in other southeastern states are required to file IRPs or IRP updates more frequently than every two years. In Georgia, Ga. Comp. R. & Regs. r. 515-3-4-.06 Integrated Resource Plan Filing Requirements and Procedures, requires electric utilities to file IRPs every three years. In addition, the utility must file an amended plan, as GPC did in 2023, if certain conditions arise including: *"The basic data used in the formulation of its last approved plan requires significant modification which affects the choice of a resource or use of an RFP which was approved as part of the integrated resource plan."* In Virginia, in 2023 the state General Assembly amended[9] Va. Code § 56-585.1, which codifies electric utility IRP requirements, to require biennial rate reviews instead of triennial reviews; the requirement of annual IRP updates remains unchanged. Section 58-37-40 of the South Carolina Code of Laws requires electric utilities to file triennial IRPs and annual updates. I also note that North Carolina Commission Rule R8-60, which applies to Virginia Electric and Power Company, d/b/a Dominion Energy North Carolina, requires biennial IRP filings and annual updates.

**Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

A. Yes.

[9] Virginia House Bill 2275, enacted July 1, 2023.