STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. E-2, SUB 1318
DOCKET NO. EC-67, SUB 55

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of Joint Application of Duke Energy Progress, LLC and North Carolina Electric Membership Corporation for a Certificate of Public Convenience and Necessity to Construct a 1,360 MW Natural Gas-Fueled Combined Cycle Electric Generating Facility in Person County, North Carolina	**DIRECT TESTIMONY OF MICHAEL QUINTO ON BEHALF OF DUKE ENERGY PROGRESS, LLC**

I. INTRODUCTION AND OVERVIEW

Q. MR. QUINTO, PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND POSITION WITH DUKE ENERGY CORPORATION.

A. My name is Michael Quinto, and my business address is 525 South Tryon Street, Charlotte, North Carolina 28202. I am the Director of IRP Advanced Analytics for Duke Energy.

Q. PLEASE BRIEFLY SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL QUALIFICATIONS.

A. I received a Bachelor of Science in Mechanical Engineering from the University of Cincinnati in 2014. I am a registered Professional Engineer in North Carolina.

Q. PLEASE DESCRIBE YOUR BUSINESS BACKGROUND AND EXPERIENCE.

A. I started my career with Duke Energy in 2011 in the cooperative education program while pursuing my engineering degree. I have been a full-time employee at Duke Energy since 2014 and have held a variety of engineering and leadership roles in Integrated Resource Planning ("IRP"); Generation Resource Planning, Modeling, and Analytics; and Regulated Generation Business Performance. I assumed my current position as Director of IRP Advanced Analytics in March 2023.

Q. WHAT ARE YOUR RESPONSIBILITIES IN YOUR CURRENT POSITION?

A. In my current position, I provide leadership and direction into the IRP modeling and planning process and financial analytics to support the Carolinas IRP functions. The team I lead supports the development and presentation of these analytics for Duke Energy Progress, LLC's ("DEP" or the "Company") and Duke Energy Carolinas, LLC's ("DEC" and together with DEP, the "Companies") IRP filings, including the Companies' 2023-2024 Carbon Plan and Integrated Resource Plan ("CPIRP" or "Plan"). My team also develops business practices and analytic methods within the IRP process to inform how the Companies' resource planning maintains reliability and prioritizes affordability in planning their systems as they modernize and transition their generation fleets.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE COMMISSION?

A. Yes. I testified before the North Carolina Utilities Commission ("Commission") in the Companies' 2022 Carbon Plan Proceeding in Docket No. E-100, Sub 179, and have pre-filed direct testimony in Docket No. E-100, Sub 190 in support of the Companies' CPIRP. I have also submitted pre-filed testimony in Docket No. E-7, Sub 1134 in support of DEC's application for approval to take control of the Lincoln County natural gas-fueled combustion turbine. I presented to the Commission as part of a technical panel on coal retirements in the Companies' 2020 IRP proceeding in Docket No. E-100, Sub 165. Most recently, I submitted pre-filed direct testimony in Docket No. E-7, Sub 1297 in support of DEC's

application for a certificate of public convenience and necessity ("CPCN") to construct a combustion turbine ("CT") generating facility at DEC's Marshall Steam Station in Catawba County, North Carolina.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to support the Company's Joint Application with the North Carolina Electric Membership Corporation ("NCEMC") for a CPCN to construct an advanced-class, combined-cycle gas turbine power block ("CC") at its existing Roxboro Plant in Person County North Carolina ("Roxboro"), with an estimated nominal winter capacity of 1,360 megawatts ("MW") (the "Proposed Facility"). Constructing the Proposed Facility is consistent with the Execution Plan and Near-Term Action Plan ("NTAP") in the Companies' proposed CPIRP, will provide needed new dispatchable generating capacity to serve DEP's customers and will also facilitate the permanent retirement of two of Roxboro's four coal-fired generating units.

My direct testimony addresses the need for the Proposed Facility and addresses how the Carbon Plan Order and the CPIRP support its development and construction to provide reliable electric service in North Carolina, as required by Commission Rule R8-61(b)(1). My testimony also demonstrates that the Companies' resource planning needs and execution plans to retire Roxboro coal-fired Units 1 and 4 and to construct the Proposed Facility to achieve commercial operation by January 1, 2029, is consistent with the Companies' least cost path to achieve compliance with the State's authorized

carbon reduction goals established in N.C.G.S. § 62-110.9, will maintain or improve upon the adequacy and reliability of the existing grid, and that construction and operation of the Proposed Facility is in the public interest.[1]

Q. ARE YOU SPONSORING ANY EXHIBITS TO THE APPLICATION?

A. Yes. I am sponsoring Exhibit 1A to the Application supporting the need for the Proposed Facility including (1) the Commission's *Order Adopting Initial Carbon Plan and Providing Direction for Future Planning,* issued on December 30, 2022, in Docket No. E-100, Sub 179 (the "Carbon Plan Order"); and (2) the Companies' 2023-2024 CPIRP, including the initial Plan filed with the Commission on August 17, 2023, in Docket No. E-100, Sub 190, and the Supplemental Planning Analysis ("SPA") filed in the same docket on January 31, 2024. I am also sponsoring Exhibit 1B to the Application containing additional resource planning information supporting the need for the Proposed Facility, as required by Commission Rule R8-61(b)(1).

II. THE CARBON PLAN ORDER AND CPIRP DEMONSTRATE THE NEED FOR THE PROPOSED FACILITY

Q. DID THE COMPANIES IDENTIFY A NEED FOR ANY NEW NATURAL-GAS FUELED CCs IN THEIR 2022 CARBON PLAN?

A. Yes. The Companies' 2022 Carbon Plan identified the need for new CCs as part of the most reasonable, least cost plan consistent with N.C.G.S. § 62-110.9. The Companies' Near-Term Action Plan in the 2022 Carbon Plan proposed an advanced-class CC achieving commercial operation in the 2027-2028

[1] N.C.G.S. § 62-110.1(e).

timeframe totaling approximately 1,200 MW and identified a potential need for a second CC by 2030.[2]

Q. DID THE COMMISSION'S CARBON PLAN ORDER ADDRESS THE NEED FOR CCs IDENTIFIED IN THE COMPANIES' 2022 CARBON PLAN?

A. Yes. In the Carbon Plan Order, the Commission gave "substantial weight" to the Companies' testimony that "Duke's planned coal unit retirements require replacement resources that can provide firm, dispatchable, and equally reliable capacity like … baseload CCs and that without such replacement resources, Duke cannot retire coal on an accelerated schedule."[3] The Commission also gave "substantial weight" to the fact that "Duke's modeling across all portfolios, supplemental portfolios, and Duke's preliminary additional IRA sensitivity analysis demonstrate a need for new CCs as part of a least cost plan to continue the energy transition, to retire coal resources, and to meet the mandates of N.C.G.S. § 62-110.9."[4] Ultimately, the Commission found that it was reasonable for the Companies to plan for 1,200 MW of new CC generating capacity, including assessing replacement generation options at the sites of retiring coal units on the DEP and DEC systems.[5]

[2] Chapter 4 (Execution Plan), Docket No. E-100, Sub 179 at 5, n. 2 (Table 4-1) (May 16, 2022).

[3] Exhibit 1A Carbon Plan Order at 78.

[4] Exhibit 1A Carbon Plan Order at 77.

[5] Exhibit 1A Carbon Plan Order at 79.

Q. DOES THE CPIRP CONTINUE TO PLAN FOR THE ORDERLY RETIREMENT OF OPERATING COAL UNITS AND CONTINUE TO IDENTIFY THE NEED FOR NEW CC GENERATION CAPACITY?

A. Yes. As will be discussed in greater detail below, the CPIRP continues to plan for the orderly retirement and replacement of DEP's and DEC's remaining 8,400 MW of operating coal capacity by 2035 and identifies the need for 6,800 MW of new CC capacity in the 2028-2033 timeframe, which includes the CC capacity identified as needed in the Companies' 2022 Carbon Plan.

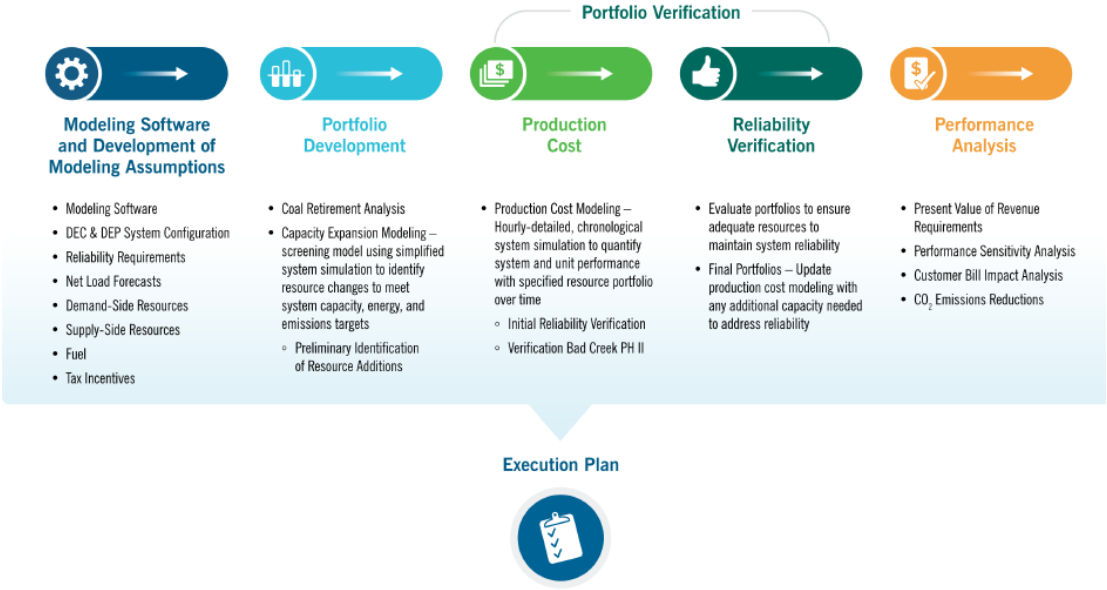
III. THE PROPOSED FACILITY CONFORMS TO THE CPIRP

Q. PLEASE DESCRIBE THE COMPANIES' RESOURCE PLANNING PROCESS USED TO DEVELOP THE CPIRP.

A. The CPIRP provides the Commission an unprecedented amount of information regarding the Companies' modeling process, proposed Execution Plan, as well as how the Companies are planning to reliably serve customers' future capacity and energy needs in the current changing energy landscape. At a high level, the Companies' modeling and portfolio analysis used to develop the CPIRP analyzed the need for new generation necessary to meet system energy and capacity needs. The analysis sets forth the Companies' proposed least cost path to achieve compliance with the carbon dioxide ("CO_2") reduction targets set forth in N.C.G.S. § 62-110.9 while maintaining or improving upon the adequacy and reliability of the existing grid. Figure 1, which can also be found in CPIRP Chapter 2 (Methodology and Key Assumptions) and in CPIRP Appendix C (Quantitative Analysis) provides an overview of the Companies' robust

analytical process used in developing the CPIRP.

Figure 1: CPIRP Analytical Process Flow Chart



Developing the CPIRP is a multi-step process that involves the development of input data, detailed modeling and analysis, and quantitative and qualitative considerations, which are more fully discussed in the CPIRP itself.

Q. PLEASE DESCRIBE THE PURPOSE OF THE MODELING APPROACH USED TO DEVELOP THE CPIRP.

A. The Companies' modeling approach is designed to determine the most reasonable, least cost, and least risk planning pathway to achieve an orderly energy transition of the Companies' power systems that maintains or improves system reliability, prudently manages risks and uncertainties, and ensures the Companies can meet customers' energy needs over the Base Planning Period through 2038 and the Carbon Neutrality Planning Horizon through 2050.

In total, the initial Plan analyzed over 30 portfolios, leveraging results and insights over various uncertainties to develop a set of near-term actions for the Commission's consideration as the next reasonable steps to achieve the targeted CO_2 emissions reductions on the path to achieving Carbon Neutrality. Based on detailed modeling analysis, the Companies identified the supply- and demand-side resources and near-term actions necessary to meet future load growth with an emphasis on "replacing before retiring" the Companies' aging coal fleet in order to maintain or improve reliability while meeting the emissions reduction targets of the State and also leveraging customers' previous investments in plant infrastructure to the extent possible.

Given the Companies' obligation to maintain or improve reliability of the existing system, the CPIRP analytical process includes a more granular reliability modeling step to ensure that the Plan can reliably meet the capacity and energy requirements of the system. SPA Portfolio P3 Fall Base, which includes the Proposed Facility, satisfies this reliability requirement as outlined in the SPA Technical Appendix and discussed more fully in CPIRP Appendix C.

Q. PLEASE EXPLAIN THE DEVELOPMENT AND IMPACTS OF THE SUPPLEMENTAL PLANNING ANALYSIS TO THE CPIRP.

A. In the initial Plan filed in August 2023, the Companies highlighted the dynamic changing energy landscape as a key theme and consideration, including an array of rapidly changing conditions impacting load growth, financial assumptions, and energy regulation and policy, among other factors. Some of those factors

have evolved since the Companies' initial Carbon Plan was reviewed by the Commission in 2022. After development of the 2023 initial Plan, the Companies identified that the Carolinas' continued economic development success in recruiting large, energy-intensive new manufacturing, electric transportation industry, data centers, advanced cloud computing, and data mining projects in 2023 resulted in significant impacts to the load forecast as 27 additional large load customers made new material commitments to take electric service from DEP and DEC. The Companies made the Commission aware of the unprecedented increase in planned Carolinas' load (both on an energy and peak demand basis) on November 30, 2023, and the need for incremental resources to continue to reliably meet the Updated 2023 Fall Load Forecast and achieve the emissions reduction targets of the system. On January 31, 2024, the Companies filed supplemental modeling and analysis through the SPA, which integrated the Updated 2023 Fall Load Forecast.

The SPA leveraged the same modeling process utilized in the initial Plan and described above. The additional modeling was developed to supplement the initial Plan, adding seven (7) additional portfolios for a total of 40 portfolios analyzed in the CPIRP, and to identify any necessary incremental resources for inclusion in the CPIRP's proposed NTAP.

Q. HOW DOES THE UPDATED 2023 FALL LOAD FORECAST FURTHER DRIVE THE NEED FOR FIRM DISPATCHABLE CAPACITY AND ENERGY?

A. My Figure 2 below shows the Companies' combined DEC and DEP non-coincident winter peak load forecast evolution. The 2023 Spring forecast used in the initial Plan integrated updated factors with respect to economic development, population growth, and electric vehicle load, representing a significant increase from the 2022 Carbon Plan Load Forecast. The Updated 2023 Fall Load Forecast, integrated into the SPA as the new base load forecast, accounted for the additional economic development load described above. Finally, the Companies have also evaluated potential for additional economic development, above what was included in the Updated 2023 Fall Load Forecast. This Continued Economic Development Load Forecast shows the potential impact of an additional 1 gigawatt ("GW") of peak winter load by 2030 and nearly 2 GW additional winter peak load by 2038. As described further below, much of the economic development load in the Updated 2023 Fall Load Forecast and in the Continued Economic Development Load Forecast is expected to be high load factor, meaning energy consumption from these customers will be high during all hours of the year, creating more significant impacts to annual energy requirements for the system compared to just their peak load contribution.

The Carolinas' recent, rapid load growth is driving the need for new generation resources to provide both additional dispatchable capacity as well as

round-the-clock energy to serve customers' future energy needs. Figures 2 and 3 below show that the Updated 2023 Fall Load Forecast is driving a 6% (2.2 GW) increase in peak winter load by 2030, and an even more significant 13% (22 terawatt-hours,[6] or 22 "TWh") increase in annual energy over the same timeframe as compared to the 2023 Spring Load Forecast. To illustrate the magnitude of the 22 TWh of annual energy increase by 2030 between these load forecasts, this is roughly equivalent to the total amount of combined electric retail sales in the states of Maine and New Hampshire in 2022.[7] This type of load requires incremental resources, such as the Proposed Facility, that can efficiently operate throughout the day and throughout the year to meet this increase in load with fewer emissions relative to other existing resources on the system.

[6] One (1) terawatt-hour is equal to 1 million megawatt-hours

[7] U.S. Energy Information Administration, US Electricity Profile 2022, (November 2, 2023), *available at* https://www.eia.gov/electricity/state/.

Figure 2: Updated 2023 Fall Load Forecast – Combined DEC and DEP Non-Coincident Winter Peak Load

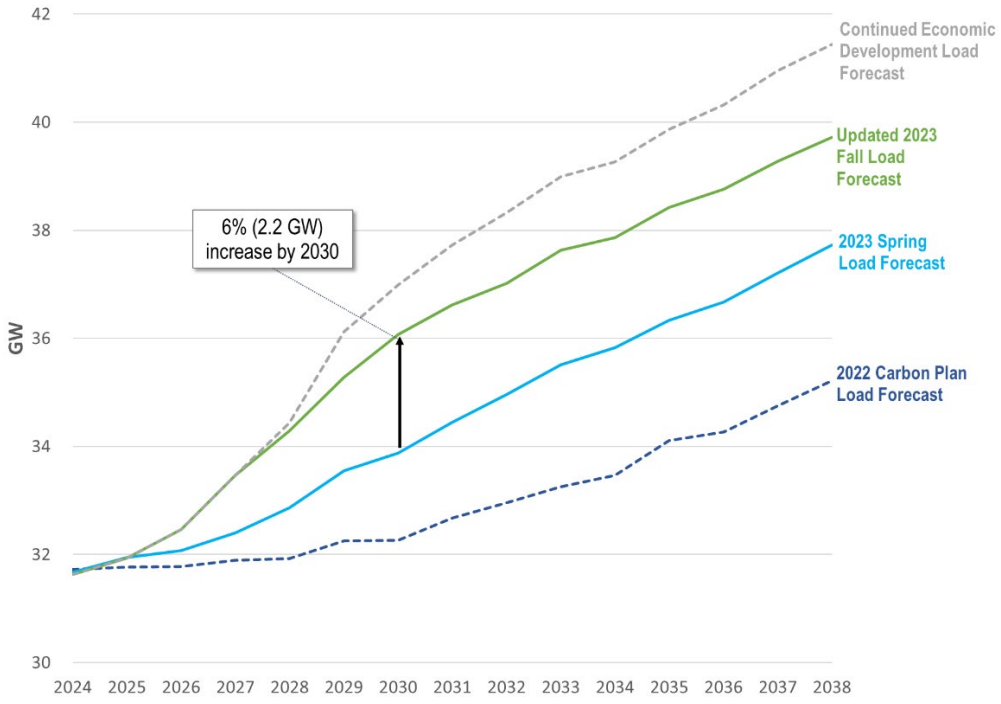
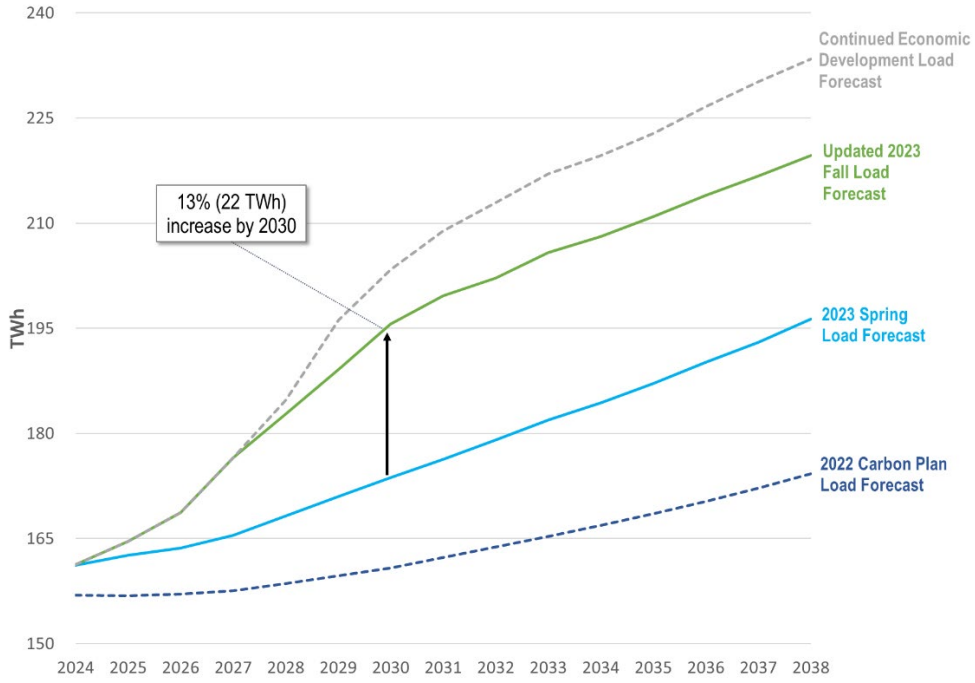


Figure 3: Updated 2023 Fall Load Forecast – Combined DEC and DEP Annual Energy Forecast



Q. HOW IS THE PRICE OF NATURAL GAS AND FUEL SUPPLY CONSIDERED WITHIN THE COMPANIES' RESOURCE PLANNING PROCESS?

A. The CPIRP is intended to be an executable resource plan developed based on realistic assumptions of future resource availability and costs. This includes the Companies' assumptions regarding the price and availability of natural gas (as well as other fuels) to fuel new natural gas resources such as the Proposed Facility. The Company's projection of natural gas commodity prices is an input to the CPIRP. The natural gas commodity price projection represents a combination of market-based and fundamentals-based price projections as discussed in CPIRP Appendix C.[8] The first five years of natural gas prices reflect market-based commodity pricing followed by a three-year transition to long-term fundamentals-based pricing. The CPIRP modeling of the system considers the cost to operate resources as part of the least cost path to achieve compliance with the authorized CO_2 reduction goals in N.C.G.S. § 62-110.9.

The CPIRP assumes CC resources in the NTAP have firm natural gas fuel supply with firm intrastate transportation service to the facility. New CCs are projected to operate primarily on natural gas but also include the cost and operational capability for dual fuel operations enabling the optionality to operate on ultra-low sulfur diesel to assure a dependable fuel supply. As Company witness Lee Mitchell explains, the Company's strategy and

[8] Exhibit 1A CPIRP Appendix C (Quantitative Analysis) at 42-43.

executable plan to provide fuel security for the Proposed Facility conforms to these planning assumptions.

Q. HOW DOES THE PROJECTED COST TO CONSTRUCT THE PROPOSED FACILITY IMPACT THE NEED DETERMINATION?

A. The CPIRP evaluates the initial capital cost to construct resources, along with their ongoing operating costs and fixed infrastructure costs, against the value they provide in meeting the system requirements when selecting resources in its economic evaluation to minimize the cost of the system. As noted above, the initial Plan addressed the dynamic nature of the changing energy landscape, including the rapid evolving resource cost environment as a result of energy supply chain and labor constraints. The Companies' SPA included supplemental updates that included increased resource costs for all technologies to reflect changes since the initial Plan's inputs were developed.[9] Additionally, the Companies conducted additional sensitivity analysis in the SPA assessing the impact on the selection of resources if CC and CT costs are increased by 25%.[10] In each of these modeling cases, CC resources were selected in 2029, supporting the need for the Proposed Facility. Exhibit 3 to the Application further addresses the dynamic inflationary impacts and trends seen in the industry impacting resource costs across the energy supply chain.

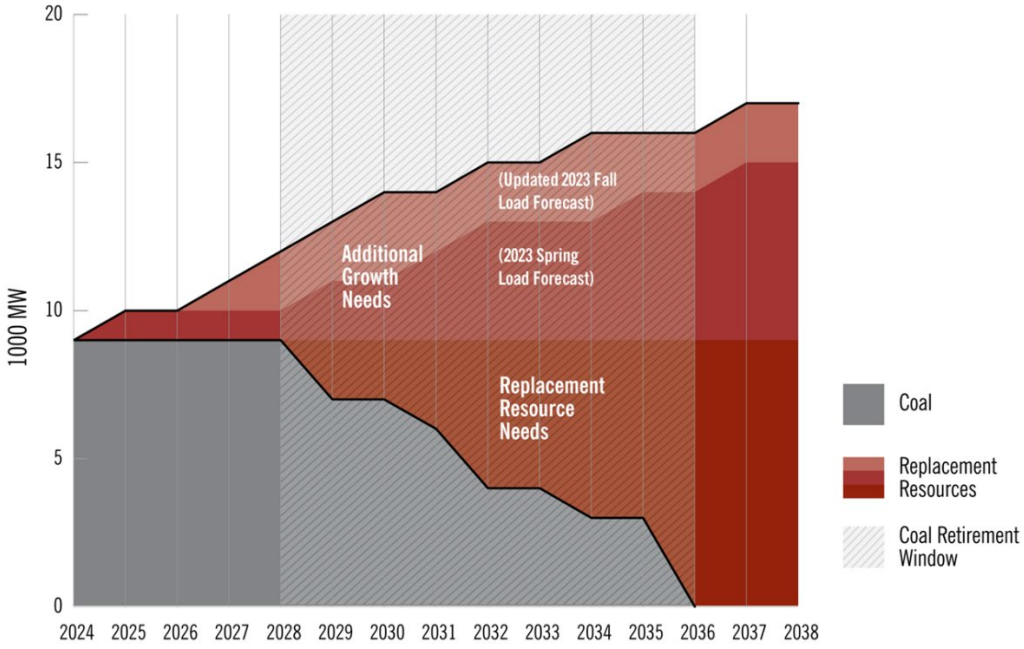
[9] Exhibit 1A CPIRP Supplemental Planning Analysis Section 2 at 23-24.

[10] Exhibit 1A SPA Technical Appendix at 7.

Q. WHAT IMPACT DO LOAD GROWTH AND PLANNED COAL PLANT RETIREMENTS HAVE ON THE NEED FOR THE PROPOSED FACILITY?

A. Load growth in the Carolinas and the Companies' planned coal unit retirements over the next decade have a direct impact on the need for the Proposed Facility. The CPIRP modeling reflects the need for significant new resource additions—including dispatchable capacity like the Proposed Facility—to meet recent, unprecedented additional load growth as well as to replace the Companies' retiring coal generation over the next decade. The Updated 2023 Fall Load forecast used in the SPA highlights this rapid and significant load growth with winter peak load growth between 2024 and 2030 increasing by eight times over the load forecast utilized in the 2022 Carbon Plan. My Figure 4 identifies both the growing capacity need from the Companies' initial Plan as well as how that capacity need has increased more significantly as a result of the State's recent, unprecedented economic development success presented in the Updated 2023 Fall Load Forecast.

Figure 4: Capacity Resource Need Created by Load Growth and Coal Retirements



Focusing specifically on the Companies' replacement resource needs, plant retirements have a direct impact on the need for the Proposed Facility. The CPIRP modeling reflects the need created by additional load growth and retiring the Companies' remaining coal generation as illustrated above in Figure 4. The coal retirement analysis conducted as part of the CPIRP identified the optimal retirement dates of Roxboro coal Units 1 and 4 in 2029.[11] Accordingly, the CC need in 2029 provides the reliable replacement capacity necessary to maintain reliability of the system by replacing before retiring. Furthermore, siting the Proposed Facility at Roxboro allows the Companies to leverage existing infrastructure at the station to facilitate deployment of these resources, as

[11] For planning purposes, the Companies assume retirements on January 1 of a given year. *See* CPIRP Appendix F at 15 (Table F-7) for retirement on beginning of year basis. *See* Supplemental Planning Analysis Section 3 at 34 (Table SPA 3-1).

further explained by Company witnesses Bobby Smith and Daniel Donochod. The projected capacity of the Proposed Facility will exceed that of the retiring Roxboro coal Units 1 and 4, thereby simultaneously offsetting the retirements and providing incremental capacity to meet peak demand load growth.

Contributing incremental firm winter peak planning capacity to the system is also critical for the Companies because this is when renewable output is typically low. The Proposed Facility's additional capacity above the retiring coal unit capacity also meets growing system capacity needs from new economic development and contributes capacity towards the Companies' 22% target winter planning reserve margin. The combination of load growth and these planned retirements contribute to the need for the Proposed Facility.

Furthermore, as described above, much of the economic development load growth the Companies are experiencing is energy-intensive load, with around the clock, 24/7 operations resulting in a high load factor. This means that the system requires resources, such as the Proposed Facility, that are able to efficiently serve load in all hours of the day. As described by witness Mitchell, the Companies have a strategy and executable plan to ensure adequate natural gas fuel supply for the Proposed Facility, which will allow the resource to reliably provide dispatchable capacity to meet system needs.

Q. PLEASE SUMMARIZE HOW THE CPIRP SUPPORTS THE NEED FOR THE PROPOSED FACILITY.

A. Building on the modeling process that I describe above, the CPIRP presents the

Companies' most reasonable, least cost, all-of-the above approach to executing the Carolinas energy transition, including the necessary near-term actions that the Commission must select and approve now as well as longer-term resource options that must be progressed in the near-term but can be further evaluated in future updates to the Plan. CPIRP modeling indicates under all Energy Transition Pathways and Portfolios, in the near-term, the Companies must progress the deployment of renewables, energy storage, and—specific to this Application for a CPCN—new dispatchable natural gas-fueled resources to meet load growth and maintain reliability on the least cost path to achieve compliance with the authorized carbon reduction goals in N.C.G.S. § 62-110.9. Additionally, long-lead time resources require early development activities to retain availability of those resources required by the system. Specifically with regards to new natural gas resources, including new CCs, these resources continue to be necessary to retire coal, reliably integrate renewable generation, meet the high load factor of incremental economic development load, and to maintain system reliability.

Fundamentally, executing an orderly energy transition requires progressing coal retirements to facilitate CO_2 emissions reductions from the system. At the projected time of retirement, Roxboro coal Units 1 and 4 will have served customers on the system for nearly 65 and 50 years, respectively. These retiring coal units require equally reliable resources to replace the retiring firm capacity, while continuing to add incremental resources to meet the additional load growth of the system. The Proposed Facility will meet these

system needs as part of the Companies' most reasonable, least cost, and least risk plan to progress the Commission's Carbon Plan.

Q. CAN YOU PLEASE ELABORATE ON THE CPIRP CONCLUSION AS TO THE NEED FOR AND TIMING OF NEW GAS-FUELED CC RESOURCES IN THE 2029 TIMEFRAME?

A. With the planned retirement of DEP's Roxboro coal Units 1 and 4 in 2029, the 2023 planning process demonstrated the need for gas-fueled CC generation sited in DEP in the 2029 timeframe. The resource options available to meet customer capacity and energy needs in the 2029 timeframe include energy efficiency/demand-side management ("DSM"), renewable resources, battery energy storage, and natural gas-fueled resources. Through the Base Planning Period, the CPIRP identifies the contribution from significant additions of variable energy renewables (solar, wind) growing from just 6% to 32% by 2038. When integrated across the grid with storage at scale, renewables, such as wind and solar, provide zero-carbon energy to the grid and serve to mitigate fuel cost volatility and reduce the Companies' reliance on fuel supply chains. However, given the seasonal, day-to-day, and week-to-week uncertainties in the availability of renewable energy, dispatchable and increasingly flexible generation resources remain critical for balancing the supply of electricity with the demand for electricity at all times.

Dispatchable generation, such as the Proposed Facility, provides essential ramping and fast response resources to the grid when renewable output

changes throughout the day and offers a necessary backup source of energy and capacity when renewable output is low.

Thus, the combination of increases in electricity demand discussed above and the operational impacts from an increase in variable renewable generation necessitate additional dispatchable generation resources to meet the Carolinas' system requirements under all system conditions. CPIRP Appendix M (Reliability and Operational Resilience) provides significant additional detail on the important role of maintaining dispatchable and increasingly flexible capacity on the system to ensure compliance with NERC reliability standards, manage increasing ramping requirements and operational uncertainty in real-time, and to ensure energy adequacy on the system as the percentage of variable energy resources increases.

Q. HOW DOES THE PROPOSED FACILITY FIT WITHIN THE COMPANIES' BROADER ENERGY TRANSITION STRATEGY OVER THE BASE PLANNING HORIZON?

A. Figure 5 provides an overview of the resource additions to the system through 2038 in the SPA modeling. Incremental natural gas resources represent approximately 20% of the nameplate capacity additions over the next 15 years but play a critical role in maintaining reliability and enabling CO_2 reductions through the retirement of coal and integrating renewables. Overall, approximately 30 GW of non-carbon emitting resources are added to the system by 2038, including approximately 17 GW of solar and 6.3 GW of battery energy storage, nearly equivalent to the Companies' combined winter peak demand

today.

Figure 5: Incremental Resources in P3 Fall Base through 2038

While a broad mix of resources is included in the overall CPIRP, the comprehensive qualitative and quantitative analyses presented in the Plan indicate that CC capacity is part of the most reasonable, least cost, and least risk Execution Plan and near-term actions to meet the 2029 planning need.

Q. WHY DID DEP SELECT THE ROXBORO PLANT FOR SITING THE PROPOSED FACILITY?

A. As explained more fully in witnesses Mitchell's testimony, siting the Proposed Facility at Roxboro allows the Company to leverage upsizing an existing proposed expansion by Public Service Company of North Carolina, Inc. d/b/a Dominion Energy North Carolina ("PSNC") for its T15 gas infrastructure project designed to serve its customers as a local distribution company ("LDC"), creating efficiency in gas deliverability planning. Once completed, the Proposed Facility will allow existing Roxboro Units 1 and 4 to retire while Units 2 and 3 will continue operations into the mid-2030s. As further discussed by witness Donochod, the Roxboro site allows DEP to utilize the Generator Replacement Request process, which allows the Company to apply to use the

transmission rights at the existing coal plants when installing new generation on-site and connecting to the transmission system at the same point of interconnection as the generation being replaced. With the ability to leverage existing transmission, staff, land, permits, security, and gas infrastructure, the Roxboro site offers efficiencies to serving customers over greenfield construction while lessening the impact to the local communities with coal retirements. More information about the Companies' approach to siting and leveraging brownfield sites, including repurposing retiring coal sites to more efficiently and cost-effectively interconnect replacement generation can be found in the testimonies of Company witnesses Smith and Donochod, CPIRP Chapter 4 (Execution Plan), CPIRP Appendix K (Natural Gas, Low-Carbon Fuels and Hydrogen), and CPIRP Appendix L (Transmission System Planning and Grid Transformation).

IV. THE PROJECTED UTILIZATION AND OPERATIONS COSTS OF THE PROPOSED FACILITY WITHIN THE FLEET

Q. PLEASE DESCRIBE DEP'S EXISTING GENERATION RESOURCE PORTFOLIO MIX.

A. The Company's generation portfolio is composed of approximately 17,000 MW of firm winter capacity through Company-owned capacity, DSM, and purchased power capacity. As shown below in Figure 6, DEP's firm winter capacity mix consists of approximately 38% gas-fueled generating capacity, 22% nuclear generating capacity, 19% coal-fired generating capacity, and the remainder in non-solar renewables/storage, DSM, firm power purchases, and solar.

Figure 6: CPIRP P3 Fall Base – 2024 DEP Firm Winter Capacity Mix[12]

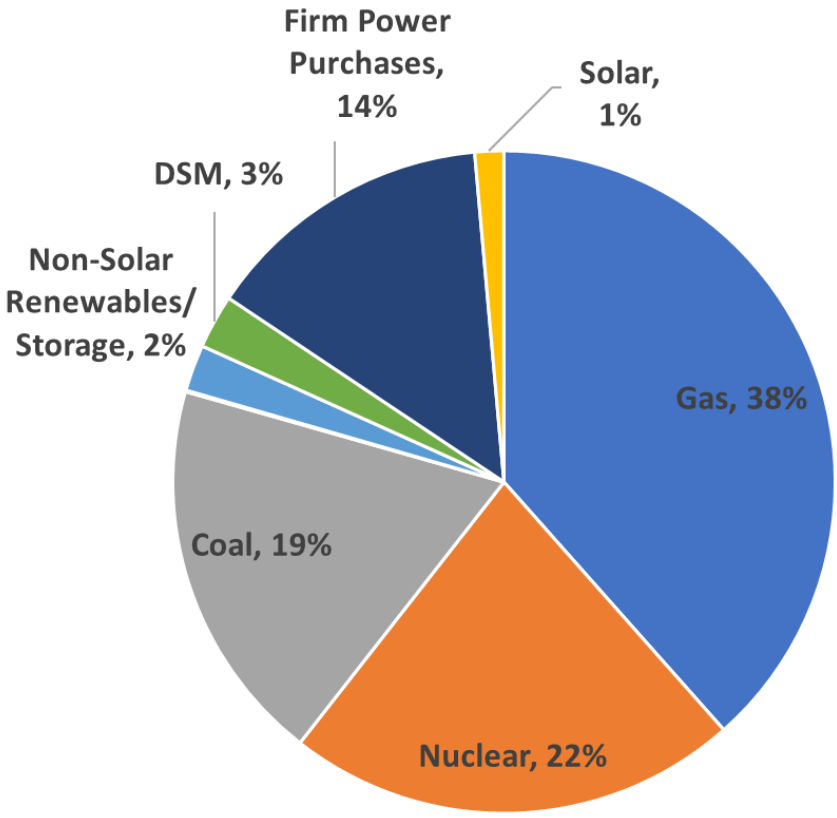
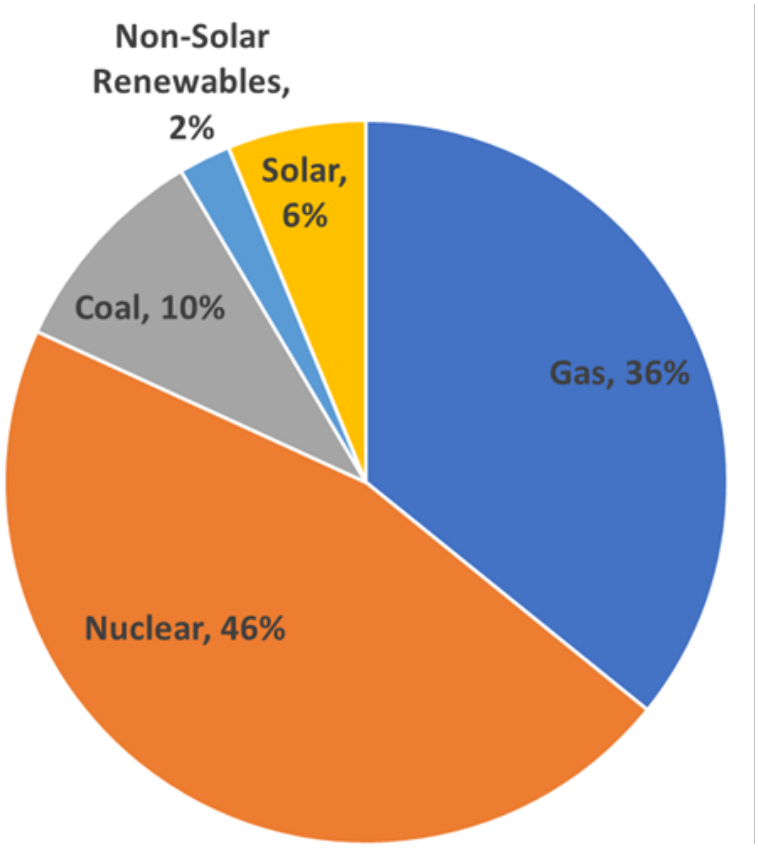


Figure 7, below, illustrates the projected 2024 energy by fuel type for the Companies' combined systems. This chart incorporates the Joint Dispatch Agreement which represents a non-firm energy-only commitment between DEC and DEP. While DEP's capacity mix is roughly 38% gas-fueled, 22% nuclear, and 19% coal, the energy mix for the Companies' combined systems is roughly 36% gas-fueled generation, 46% nuclear generation, and 10% coal-fired generation.

[12] Gas category includes oil-fueled CT capacity.

Figure 7: CPIRP P3 Fall Base – 2024 Projected DEP+DEC Energy Mix[13]



Q. WILL THE PROPOSED FACIILTY CONTRIBUTE TO RESOURCE AND FUEL DIVERSITY?

A. Yes. Today, CC resources are approximately 21% of DEP's firm winter capacity mix. The retiring Roxboro coal units are projected to operate generally only during high load periods through their projected retirement dates. The Proposed Facility's advanced-class CC will be able to more efficiently and flexibly meet the needs of the system with shorter required start-up and minimum online times compared to the Companies' existing fleet. While the projected 2024 energy mix represents natural gas as the second largest portion of the system,

[13] Gas category includes oil-fired generation.

CC resources will be able to more efficiently serve the fleet with fewer CO_2 emissions for the energy produced compared to the generation from existing system resources the Proposed Facility will be replacing. Over time, the energy contribution from natural gas generation continues to decrease as more solar and wind resources are brought online, but the new CCs will continue to provide flexibility for the system to respond to rapidly changing load and variable energy resources while providing a dispatchable back-stand for the system, as further described in CPIRP Appendix M. Importantly, even as DEP's utilization of these resources decreases over time, this type of dispatchable generation provides the reliable capacity in system peak load conditions, especially in the winter mornings when generation from solar is limited. To further support the fuel supply diversity of the system, the Proposed Facility will be dual-fuel capable with available operation on ultra-low sulfur diesel.

When the Proposed Facility comes online, CC resources are expected to make up approximately 28% of the firm winter capacity of the DEP system, while overall, gas-fired capacity would represent 43% of the firm capacity of the system, with nuclear representing 21% and coal being reduced from 19% to just 12% of the firm winter planning capacity of the system. With the addition of batteries and more renewables as shown above in Figure 5, the Proposed Facility adds to a diversified fuel supply and resource mix, while executing an orderly retirement of coal capacity.

Q. HOW IS THE PROPOSED FACILITY PROJECTED TO OPERATE AND MEET THE CAPACITY NEEDS OF THE SYSTEM?

A. The Proposed Facility is projected to operate as a baseload resource, with flexibility to operate efficiently around-the-clock to provide emissions reductions relative to replacement energy available to the system and meet the incremental high load factor economic development load described above, but also to ramp up and down to respond to variation in load and generation on the system especially from variable energy and energy limited resources to maintain the reliability of the grid. Over the following decades, the utilization of these resources will lean more toward operational flexibility as more zero-carbon emitting resources, such as solar, wind, and nuclear are brought onto the system. However, the Proposed Facility, being an advanced-class CC, will still be among the most efficient resources on the system and will be relied on to provide around the clock power for longer than existing resources on the system.

The capacity provided by the Proposed Facility is critically important to achieving the Companies' target 22% planning reserve margin over time and towards maintaining or improving resource adequacy of the system overall. The Proposed Facility's estimated nominal winter capacity of 1,360 MW, along with its dual-fuel capability, will contribute to the capacity needs of the system, allowing for the retirement of Roxboro coal-fired Units 1 and 4, while providing more capacity than these facilities to continue to contribute to the incremental capacity requirements of the system. Exhibit 1B to the Application provides

additional information on the need for the Proposed Facility and how it will operate as part of the system over time.

Q. WHAT ARE THE PROJECTED ANNUAL OPERATING EXPENSES FOR THE PROPOSED FACILITY?

A. Confidential Exhibit 3 to the Application contains projections for operating expenses, including fuel costs, along with the anticipated in-service expenses associated with the Proposed Facility for the 12-month period following commencement of commercial operation.

Q. DID THE COMPANY CONSIDER ANY OTHER FACTORS IN DETERMINING THAT THE PROPOSED FACILITY APPROPRIATELY BALANCES LEAST COST PLANNING, CO_2 REDUCTION COMPLIANCE, AND MAINTAINING OR IMPROVING GRID RELIABILITY IN THE CONTEXT OF A RAPIDLY INCREASING LOAD FORECAST?

A. Yes. As highlighted above, the Proposed Facility has been selected as part of the Companies' least cost NTAP to reliably serve customers' future energy needs and construction of the advanced-class CC will also allow the Company to execute the planned retirement of two aging coal units and to replace this capacity with equally reliable generating resources. Siting the Proposed Facility at Roxboro also allows the Company to leverage efficiencies and cost savings associated with repurposing the retiring coal facility, balancing the least cost planning criteria. As previously stated, the Proposed Facility is consistent with

the Carbon Plan Order and is consistent with the energy transition plan in the CPIRP, inclusive of the SPA. These filings continue to show the role of efficient, hydrogen-capable CCs as a component of carbon reduction trajectory presented in those plans. The selection of advanced-class CCs reduces technology obsolescence risk, as these resources are suitable for future conversion to operate exclusively on hydrogen. Hydrogen conversion, along with other options, continues to justify the reasonableness of 35-year service life and allows consistency between the Proposed Facility and the Carbon Neutrality requirement by 2050. The Proposed Facility is expected to able to be compliant with the phase 1 requirement for new baseload gas units, with an emissions rate under 770 lbs. CO_2 per megawatt-hour (gross) in Environmental Protection Agency ("EPA") Clean Air Act Section 111 Rule for new gas generation as currently proposed. The Companies have identified the continued need for advanced-class CCs under the EPA Clean Air Act Section 111 compliance pathway scenarios for proposed phase 2 and phase 3 requirements or by limiting utilization of new gas resources in Supplemental Portfolios as explained in Appendix C to the initial Plan. Witness Donochod further discusses the potential technology options to operate these advanced-class CC units on hydrogen or with CCUS.

V. NCEMC JOINT OWNERSHIP DOES NOT IMPACT DEP'S NEED FOR THE PROPOSED FACILITY

Q. WILL DEP OWN ALL 1,360 MW OF THE PROPOSED FACILITY?

A. No. As identified in the Joint Application and discussed by NCEMC witness Amadou Fall, NCEMC has exercised an option under their wholesale power

supply and coordination agreement ("NCEMC Power Supply Contract") with DEP to own approximately 225 MW of the Proposed Facility. Accordingly, NCEMC is a joint applicant for the CPCN and is providing testimony in support of its joint ownership of the Proposed Facility. My testimony specifically supports DEP's retail customers' need for DEP's ownership share (approximately 1,135 MW) of the Proposed Facility. To be clear, however, if NCEMC did not exercise its right to co-own a portion of the Proposed Facility, the Company would need the entire estimated nominal winter capacity of 1,360 MW of the Proposed Facility to serve customers.

Q. PLEASE EXPLAIN THE IMPACT OF NCEMC JOINING THE COMPANIES AS A CO-APPLICANT.

A. NCEMC is currently a wholesale power supply customer of DEP. The current NCEMC Power Supply Contract allows NCEMC the right to co-own new baseload generation that DEP plans for development and construction to serve customer load in DEP. The contract caps the maximum capacity NCEMC can own for this project at approximately 225 MW, and NCEMC is exercising its right to jointly own approximately 225 MW of the facility's capacity. NCEMC's joint ownership will result in a reduction in the NCEMC wholesale requirements load the Company would have otherwise been required to serve. In other words, NCEMC's joint ownership will reduce NCEMC's peak load and energy requirements the Company had been planning to serve by an amount equal to the capacity and energy to be produced by NCEMC's portion of the

Proposed Facility.

Q. HOW DOES NCEMC EXERCISING ITS RIGHT TO JOINTLY OWN 225 MW OF THE PROPOSED FACILITY IMPACT THE COMPANY'S NEED FOR THE RESOURCE?

A. NCEMC's decision has no impact on the need for the Proposed Facility. As described above, NCEMC jointly owning the Proposed Facility and serving its existing load will be neutral to the planning presented in the CPIRP because NCEMC's joint ownership will reduce on a 1:1 basis the amount of capacity and energy that DEP had been planning to serve in the CPIRP. The Proposed Facility is needed as part of the least cost plan to serve DEP's retail customers whether fully owned by DEP and used as part of the system to serve NCEMC's load through the NCEMC Power Supply Contract, or jointly owned with NCEMC and NCEMC's joint ownership percentage being used to serve NCEMC's energy and capacity needs directly.

VI. CONCLUSION

Q. IN YOUR PROFESSIONAL OPINION, IS THE PROPOSED FACILITY NEEDED AND CONSISTENT WITH THE COMISSION'S CARBON PLAN ORDER AND THE RESOURCE NEED AND EXECUTION PLAN PRESENTED IN THE CPIRP?

A. Yes. The Proposed Facility is an important and necessary part of DEP's plans for reliably meeting its customers' growing capacity and energy needs beginning in the 2029 timeframe. Importantly, the Proposed Facility will be among the most efficient and flexible CC technologies on the market, suitable

for future conversion to operate on carbon-neutral fuels, and will facilitate retirement of the Company's coal resources, will modernize the region's generation infrastructure and assist with the integration of additional renewable resources. The Proposed Facility is consistent with the least cost path to achieve compliance with the authorized CO_2 reduction goals in N.C.G.S. § 62-110.9, will maintain or improve upon the adequacy and reliability of the existing grid, and the construction and operation of the Proposed Facility is in the public interest. The Companies' comprehensive planning process has identified an "all-of-the-above" need for resources to meet the requirements under N.C.G.S. § 62-110.9 and the Proposed Facility is a prudent and least cost component of the Companies' Execution Plan to meet the significant capacity additions required over the planning horizon.

Q. IS THE PROPOSED FACILITY NECESSARY TO ENSURE THE COMPANY ACHIEVES THE APPLICABLE CARBON REDUCTION MANDATES WHILE ALSO ENSURING THE ADEQUACY AND RELIABILITY OF THE GRID ARE MAINTAINED OR IMPROVED?

A. Yes. As I previously noted, the Commission gave "substantial weight" to the Companies' testimony that new CC resources identified by the Companies are "essential to achieving the Interim Target, while maintaining or improving reliability, and doing so along a least cost path[]" and found "persuasive" the Companies' testimony that "failing to develop new natural gas resources jeopardizes Duke's ability to achieve the mandated carbon dioxide emissions

reduction[.]"[14] As discussed above and more fully articulated in the CPIRP, the Company's need for new CC resources is part of a least cost plan that maintains reliability and operational resilience and the need for the resources has only grown since the Commission made its observations in the Carbon Plan Order. The Proposed Facility will provide the system with a dispatchable resource with fast ramping capability and firm fuel supply to allow the Company to add greater volumes of variable energy and energy-limited resources to its portfolio. The efficiency of the Proposed Facility with be able to more cost effectively provide around the clock power to support increased load due to economic development with a lower emissions rate relative to the existing resources it is replacing on the system. Furthermore, the Companies utilize granular reliability models as part of the overall modeling process to ensure CPIRP portfolios maintain or improve reliability. These additional tools ensure consumer affordability and system reliability as the system transitions to Carbon Neutrality by 2050.

Q. MR. QUINTO, DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes.

[14] Exhibit 1A Carbon Plan Order at 79.