

STATE OF NORTH CAROLINA  
UTILITIES COMMISSION  
RALEIGH

DOCKET NO. E-7, SUB 1297

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of:	)	
Application of Duke Energy Carolinas,	)	
LLC for a Certificate of Public	)	<b>DIRECT TESTIMONY OF</b>
Convenience and Necessity to Construct an	)	<b>MICHAEL QUINTO ON BEHALF</b>
850 MW Natural Gas-Fired Combustion	)	<b>OF DUKE ENERGY</b>
Turbine Electric Generating Facility in	)	<b>CAROLINAS, LLC</b>
Catawba County, North Carolina	)	

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1                                   **I. INTRODUCTION AND OVERVIEW**

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

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

7   **Q. PLEASE BRIEFLY SUMMARIZE YOUR EDUCATIONAL**  
8   **BACKGROUND AND PROFESSIONAL QUALIFICATIONS.**

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

12   **Q. PLEASE DESCRIBE YOUR BUSINESS BACKGROUND AND**  
13   **EXPERIENCE.**

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

1 **Q. WHAT ARE YOUR RESPONSIBILITIES IN YOUR CURRENT**  
2 **POSITION?**

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

14 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE NORTH**  
15 **CAROLINA UTILITIES COMMISSION?**

16 A. Yes. I testified before the North Carolina Utilities Commission ("Commission"  
17 or "NCUC") in the Companies' 2022 Carbon Plan Proceeding in Docket No. E-  
18 100, Sub 179, and submitted pre-filed testimony in Docket No. E-7, Sub 1134  
19 in support of DEC's application for approval to take control of the Lincoln  
20 County natural gas-fired combustion turbine. I also presented to the  
21 Commission as part of a technical panel on coal retirements in the Companies'  
22 2020 IRP proceeding in Docket No. E-100, Sub 165. Most recently, I submitted

1 pre-filed direct testimony in Docket No. E-100, Sub 190 in support of the  
2 Companies' CPIRP.

3 **Q. ARE YOU SPONSORING ANY EXHIBITS IN THE APPLICATION?**

4 A. Yes. I am sponsoring Exhibit 1A to the Application supporting the need for the  
5 Proposed Facility (as defined below), providing (1) the Commission's *Order*  
6 *Adopting Initial Carbon Plan and Providing Direction for Future Planning*,  
7 issued on December 30, 2022, in Docket No. E-100, Sub 179 (the "Carbon Plan  
8 Order"); and (2) the Companies' 2023-2024 CPIRP, including the initial Plan  
9 filed with the Commission on August 17, 2023, in Docket No. E-100, Sub 190,  
10 and the Supplemental Planning Analysis ("SPA") filed with the Commission on  
11 January 31, 2024, in Docket No. E-100, Sub 190. I am also sponsoring Exhibit  
12 1B to the Application containing additional resource planning information  
13 supporting the need for the Proposed Facility, as required by Commission Rule  
14 R8-61(b).

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

16 A. The purpose of my testimony is to support the Company's Application for a  
17 certificate of public convenience and necessity to construct an electric  
18 generating facility in Catawba County, North Carolina. Specifically, the  
19 Company is proposing to construct two hydrogen-capable, advanced-class  
20 natural gas simple cycle combustion turbine ("CT") units at the site of its  
21 existing Marshall Steam Station ("Marshall"), each with an estimated nominal  
22 winter capacity of 425 megawatts ("MW") for a total estimated nominal winter

1 capacity of 850 MW (“Proposed Facility”). Constructing the Proposed Facility  
2 is consistent with the Execution Plan and Near-Term Action Plan (“NTAP”) in  
3 the Companies’ proposed CPIRP, will provide needed new dispatchable  
4 generating capacity to serve DEC’s customers and will also facilitate the  
5 permanent retirement of two of Marshall’s four coal-fired generating units.

6 My direct testimony addresses the need for the Proposed Facility and  
7 addresses how the Carbon Plan Order and the CPIRP support its development  
8 and construction to provide reliable electric service in North Carolina, as  
9 required by Rule R8-61(b)(1). My testimony also demonstrates that the  
10 Companies’ resource planning needs and execution plans to retire Marshall  
11 coal-fired Units 1 and 2 and to construct the Proposed Facility to achieve  
12 commercial operation by January 1, 2029 is consistent with the Companies’  
13 least cost path to achieve compliance with the State’s authorized carbon  
14 reduction goals established in N.C.G.S. § 62-110.9, will maintain or improve  
15 upon the adequacy and reliability of the existing grid, and that its construction  
16 and operation is in the public interest.<sup>1</sup>

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

19 **Q. DID THE COMPANY IDENTIFY THE NEED FOR ANY NEW**  
20 **NATURAL-GAS FIRED CTs IN ITS 2022 CARBON PLAN?**

21 **A.** Yes. The Companies’ 2022 Carbon Plan identified the need for new CTs as part  
22 of the most reasonable, least cost plan consistent with N.C.G.S. § 62-110.9. The

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<sup>1</sup> N.C.G.S. § 62-110.1(e).

1 Companies' Near-Term Action Plan in the 2022 Carbon Plan proposed two  
2 advanced-class CTs achieving commercial operation in the 2027-2028  
3 timeframe totaling approximately 800 MW.

4 **Q. DID THE COMMISSION'S CARBON PLAN ORDER ADDRESS THE**  
5 **NEED FOR CTs IDENTIFIED IN THE COMPANIES' 2022 CARBON**  
6 **PLAN?**

7 A. Yes. In the Carbon Plan Order, the Commission recognized that: “[n]umerous  
8 modeling portfolios, including intervenor-sponsored modeling, also identified  
9 the need for new natural gas CTs by 2030.”<sup>2</sup> The Commission gave “substantial  
10 weight” to the Companies’ testimony that that CTs can provide the firm,  
11 dispatchable, and reliable capacity required to replace retiring coal units.<sup>3</sup> The  
12 Commission also gave substantial weight to the Companies’ testimony that the  
13 CT resources identified by the Companies were “essential to achieving the  
14 [70% CO<sub>2</sub> emission reduction] Interim Target, while maintaining or improving  
15 reliability, and doing so along a least cost path[,]” and found “persuasive” the  
16 Companies’ testimony that “failing to develop new natural gas resources  
17 jeopardizes Duke’s ability to achieve the mandated carbon dioxide emissions  
18 reduction[.]”<sup>4</sup> Ultimately, the Commission concluded that it was reasonable for  
19 the Companies to plan for 800 MW of new CT generating capacity, including

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<sup>2</sup> Carbon Plan Order at 77.

<sup>3</sup> Carbon Plan Order at 78.

<sup>4</sup> Carbon Plan Order at 79

1 assessing replacement generation options at the sites of retiring coal units on  
2 the DEC and DEP systems.<sup>5</sup>

3 **Q. DOES THE CPIRP CONTINUE TO PLAN FOR THE ORDERLY**  
4 **RETIREMENT OF OPERATING COAL UNITS AND CONTINUE TO**  
5 **IDENTIFY THE NEED FOR NEW CT GENERATION CAPACITY?**

6 A. Yes. As will be discussed in greater detail below, the CPIRP continues to plan  
7 for the orderly retirement and replacement of DEC's and DEP's remaining  
8 8,400 MW of operating coal capacity by 2035 and identifies the need for 2,125  
9 MW of new CT capacity in the 2028-2031 timeframe which includes the 800  
10 MW of CT capacity identified in the 2022 Carbon Plan.

11 **III. THE PROPOSED FACILITY CONFORMS TO THE CPIRP**

12 **Q. PLEASE DESCRIBE THE COMPANY'S RESOURCE PLANNING**  
13 **PROCESS USED TO DEVELOP THE CPIRP.**

14 A. The CPIRP provides the Commission an unprecedented amount of information  
15 regarding the Companies' modeling process, proposed Execution Plan, as well  
16 as how the Companies are planning to reliably serve customers' future capacity  
17 and energy needs in the current changing energy landscape. At a high level, the  
18 Company's modeling and portfolio analysis used to develop the CPIRP  
19 analyzed the need for new generation necessary to meet system energy and  
20 capacity needs. The analysis sets forth the Companies' proposed least-cost path  
21 to achieve compliance with the carbon-dioxide ("CO<sub>2</sub>") reduction targets set  
22 forth in N.C.G.S. § 62-110.9 while maintaining or improving upon the adequacy

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<sup>5</sup> *Id.*

1 and reliability of the existing grid. Quinto Figure 1, which can also be found in  
 2 CPIRP Chapter 2 (Methodology and Key Assumptions) and Appendix C  
 3 (Quantitative Analysis), provides an overview of the Companies’ robust  
 4 analytical process used in developing the CPIRP.

**Figure 1: CPIRP Analytical Process Flow Chart**



6  
 7 Developing the CPIRP is a multi-step process that involves the  
 8 development of input data, detailed modeling and analysis, and quantitative and  
 9 qualitative considerations, which are more fully discussed in the CPIRP itself.

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

12 A. The Companies’ modeling approach is designed to determine the most  
 13 reasonable, least cost, and least risk planning pathway to achieve an orderly  
 14 energy transition of the Companies’ power system that maintains or improves



1 system reliability, prudently manages risks and uncertainties, and ensures the  
2 Companies can meet customers' energy needs over the Base Planning Period  
3 through 2038 and the Carbon Neutrality Planning Horizon through 2050.

4 In total, the initial Plan analyzed over 30 portfolios, leveraging results  
5 and insights over various uncertainties to develop a set of near-term actions to  
6 be considered by the Commission as the next reasonable steps to achieve the  
7 targeted CO<sub>2</sub> emissions reductions on the path to achieving Carbon Neutrality.  
8 Based on detailed modeling analysis, the Companies identified the supply- and  
9 demand-side resources and near-term actions necessary to meet future load  
10 growth with an emphasis on “replacing before retiring” the Companies' aging  
11 coal fleet in order to maintain or improve reliability while meeting the  
12 emissions reduction targets of the State and also to leverage customer's  
13 previous investments in plant infrastructure to the extent possible.

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

16 A. In the initial Plan filed in August 2023, the Companies highlighted the dynamic  
17 changing energy landscape as a key theme and consideration, including an array  
18 of rapidly changing conditions impacting load growth, financial assumptions,  
19 and energy regulation and policy, among other factors, even since the Carbon  
20 Plan was developed and reviewed by the Commission in 2022. After  
21 development of the 2023 initial Plan, the Companies identified that the  
22 Carolinas' continued economic development success in recruiting large,  
23 energy-intensive new manufacturing, electric transportation industry, data

1 centers, and advanced cloud computing and data mining projects in 2023  
2 resulted in significant impacts to the load forecast as 27 additional large-load  
3 customers made new material commitments to take electric service from DEC  
4 and DEP. On November 30, 2023, the Companies made the Commission aware  
5 of the unprecedented increase in planned Carolinas' load (both on an energy  
6 and peak demand basis) and the need for incremental resources to continue to  
7 reliably meet the Updated 2023 Fall Load Forecast and achieve the emissions  
8 reduction targets of the system. On January 31, 2024, the Companies filed  
9 supplemental modeling and analysis through the SPA, which integrated the  
10 Updated 2023 Fall Load Forecast.

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

16 **Q. HOW IS THE PRICE OF NATURAL GAS AND FUEL SUPPLY**  
17 **CONSIDERED WITHIN THE COMPANY'S RESOURCE PLANNING**  
18 **PROCESS?**

19 A. The CPIRP is intended to be an executable resource plan developed based on  
20 realistic assumptions of future resource availability and costs. This includes the  
21 Companies' assumptions regarding the price and availability of natural gas (as  
22 well as other fuels) to fuel new natural gas resources such as the Proposed

1 Facility. The Company’s projection of natural gas commodity prices is an input  
2 to the CPIRP. The natural gas commodity price projection represents a  
3 combination of market prices and fundamental price projections as discussed in  
4 CPIRP Appendix C. The first five years of natural gas prices reflect market-  
5 based commodity pricing followed by a three-year transition to long-term  
6 fundamentals-based pricing. The CPRIP modeling of the system considers the  
7 cost to operate resources as part of the least cost path to achieve compliance  
8 with the authorized CO<sub>2</sub> reduction goals in N.C.G.S. § 62-110.9.

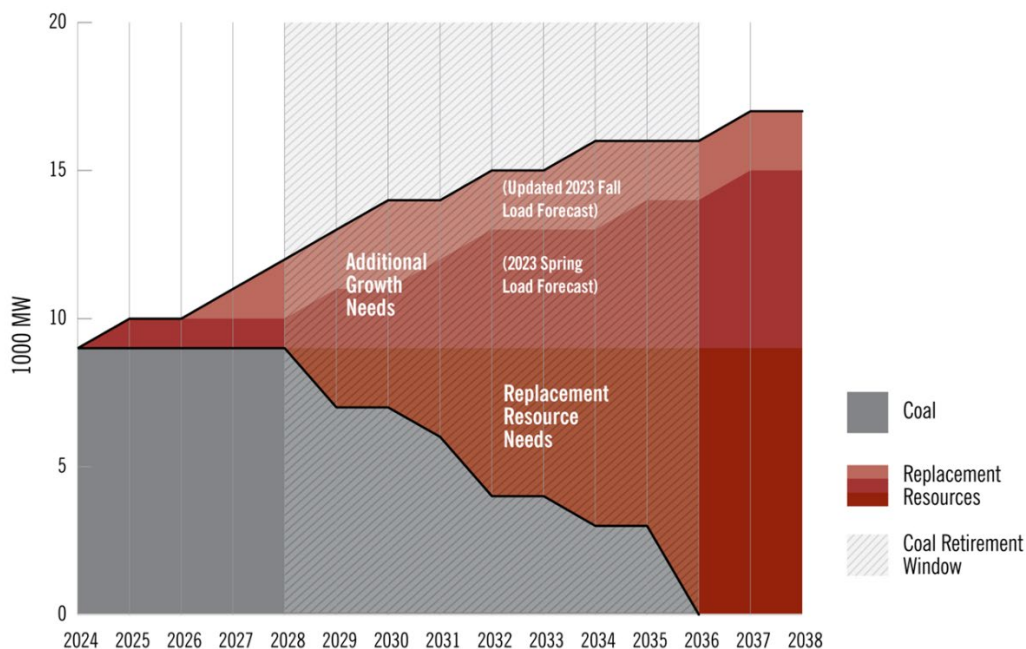
9 The CPIRP assumes peaking CT resources in the NTAP utilize Transco  
10 Zone 5 firm delivered gas supply with firm intrastate transportation service to  
11 the facility. New CTs are projected to operate primarily on natural gas but also  
12 include the cost and operational capability for dual fuel operations enabling the  
13 optionality to also operate on ultra-low sulfur diesel (“ULSD”) to assure a  
14 dependable fuel supply. As Company witness Bobby Smith explains, the  
15 Proposed Facility conforms to these planning assumptions.

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

19 A. Load growth in the Carolinas and the Companies’ planned coal unit retirements  
20 over the next decade drive the need for the Proposed Facility. The CPIRP  
21 modeling reflects the need for significant new resource additions—including  
22 dispatchable capacity like the Proposed Facility—to both meet recent,  
23 unprecedented additional load growth and to replace the Companies’ retiring

1 coal generation over the next decade. The Updated 2023 Fall Load forecast used  
 2 in the SPA highlights this rapid and significant load growth, with winter peak  
 3 load growth between 2024 and 2030 increasing by eight times over the load  
 4 forecast utilized in the 2022 Carbon Plan. Quinto Figure 3 identifies both the  
 5 growing capacity need from the Companies’ initial Plan as well as how that  
 6 capacity need has increased even more significantly as a result of the State’s  
 7 recent, unprecedented economic development success presented in the Updated  
 8 2023 Fall Load Forecast.

9 **Figure 3: Capacity Resource Need Created by Load Growth and Coal**  
 10 **Retirements**



11

12

13

14

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

1 the Companies' remaining coal generation as illustrated in Figure 3 above. The  
2 coal retirement analysis conducted as part of the CPIRP identified the optimal  
3 retirement dates of Marshall coal-fired Units 1 and 2 in 2029 across all  
4 Pathways.<sup>6</sup> Accordingly, the CT need in 2029 provides the reliable replacement  
5 capacity necessary to maintain reliability of the system by replacing before  
6 retiring these aging coal units. Furthermore, the siting of the CT resources at  
7 Marshall allows the Companies to leverage existing infrastructure at the station  
8 in the deployment of these resources, as further explained by witness Smith.  
9 The projected capacity of the Proposed Facility will exceed that of the retiring  
10 Marshall coal-fired Units 1 and 2, thereby offsetting the retirements while  
11 providing incremental capacity to meet peak demand load growth.

12 Contributing incremental firm winter peak planning capacity to the  
13 system is also critical for the Company because this is when renewable output  
14 is typically low. The additional capacity above the retiring coal unit capacity  
15 also meets growing system capacity needs from new economic development  
16 and contributes capacity towards the Companies' 22% target winter planning  
17 reserve margin. The combination of load growth and these planned retirements  
18 contribute to the need for the Marshall CT additions.

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<sup>6</sup> For planning purposes, the Companies assume retirements on January 1 of a given year. *See* CPIRP Appendix F at 15 (Table F-7).

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

3 A. Building on the modeling process that I describe above, the CPIRP presents the  
4 Companies' most reasonable, least-cost, all-of-the above approach to executing  
5 the Carolinas energy transition including the necessary near-term actions that  
6 the Commission must select and approve now as well as longer-term resource  
7 options that must be progressed in the near-term but can be further evaluated in  
8 future updates to the Plan. CPIRP modeling indicates under all Energy  
9 Transition Pathways and Portfolios, in the near-term, the Companies must  
10 progress the deployment of renewables, energy storage, and new dispatchable  
11 natural gas-fueled resources to meet load growth and maintain reliability on the  
12 least cost path to achieve compliance with the authorized carbon reduction goals  
13 in N.C.G.S. § 62-110.9. Additionally, long-lead time resources require early  
14 development activities to retain availability of those resources required by the  
15 system. Specifically with regards to new natural gas resources, including new  
16 CTs, these resources continue to be needed to retire coal, reliably integrate  
17 renewable generation, and to maintain system reliability.

18 Fundamentally, executing an orderly energy transition requires  
19 progressing coal retirements to facilitate CO<sub>2</sub> emissions reductions from the  
20 system. At the projected time of retirement, Marshall coal-fired Units 1 and 2  
21 will have served customers on the system for nearly 65 years. These units  
22 require equally reliable resources to replace the retiring firm capacity, while

1 continuing to add incremental resources to meet the additional load growth of  
2 the system. These system needs will be met by the Proposed Facility as part of  
3 the Companies' most reasonable, least cost, and least risk plan to progress the  
4 Commission's Carbon Plan and to maintain reliability of the system.

5 **Q. CAN YOU PLEASE ELABORATE ON THE CPIRP CONCLUSION AS**  
6 **TO THE NEED FOR AND TIMING OF NEW GAS-FIRED CT**  
7 **RESOURCES IN THE 2029 TIMEFRAME?**

8 A. With the planned retirement of DEC's Marshall coal-fired Units 1 and 2 in 2029,  
9 the 2023 planning process demonstrated the need for peaking gas-fired  
10 generation in the 2029 timeframe. The resource options available to meet  
11 customer capacity and energy needs in the 2029 timeframe include energy  
12 efficiency measures, demand-side management ("DSM"), renewable resources,  
13 battery energy storage, and natural gas-fired resources. Through the 15-year  
14 Base Planning Period, the CPIRP identifies the contribution from significant  
15 additions of variable energy renewables (solar, wind) will grow from just 6%  
16 today to 32% by 2038. When integrated across the grid with storage at scale,  
17 renewables, such as wind and solar, provide carbon-neutral energy to the grid  
18 and serve to mitigate fuel cost volatility and reduce the Companies' reliance on  
19 fuel supply chains. However, given the seasonal, day-to-day, and week-to-week  
20 uncertainties in the availability of renewable energy, dispatchable and  
21 increasingly flexible generation resources remain critical for balancing the  
22 supply of electricity with the demand for electricity at all times.

1 Dispatchable generation, such as the flexible natural gas resources at the  
2 Proposed Facility, provides essential ramping and fast response resources to the  
3 grid when renewable output changes throughout the day and offers a necessary  
4 backup source of energy and capacity when renewable output is low. Thus, the  
5 combination of increases in electricity demand discussed above and the  
6 operational impacts from an increase in variable renewable generation  
7 necessitate additional dispatchable generation resources to meet the Carolinas'  
8 system requirements under all system conditions. CPIRP Appendix M  
9 (Reliability and Operational Resilience) provides significant additional detail  
10 on the important role of maintaining dispatchable and increasingly flexible  
11 capacity on the system to ensure compliance with the North American Electric  
12 Reliability Corporation's reliability standards, manage increasing ramping  
13 requirements and operational uncertainty in real-time, and to ensure energy  
14 adequacy on the system as the percentage of variable energy resources increase.

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

18 A. Figure 4 provides an overview of the resource additions to the system through  
19 2038 in the SPA modeling. Overall, in Portfolio P3 Fall Base, incremental  
20 natural gas resources represent approximately 20% of the nameplate capacity  
21 additions over the next 15 years but play a critical role in maintaining reliability  
22 and enabling CO<sub>2</sub> reductions through the retirement of coal and integrating



1 renewables. Overall, approximately 30 GW of non-carbon emitting resources  
 2 are added to the system by 2038, including approximately 17 GW of solar and  
 3 6.3 GW of battery energy storage, nearly equivalent to the Companies'  
 4 combined winter peak demand today.

5 **Figure 4: Incremental Resources in P3 Fall Base through 2038**



6  
 7 While a broad mix of resources is included in the overall Plan, the  
 8 comprehensive qualitative and quantitative analyses presented in the Plan  
 9 indicate that CT capacity is needed and part of the most reasonable, least cost,  
 10 and least risk Execution Plan and near-term actions to meet the 2029 planning  
 11 need.

12 **Q. WHY DID DUKE ENERGY CAROLINAS SELECT THE MARSHALL**  
 13 **STEAM STATION FOR SITING THE ADVANCED-CLASS CT**  
 14 **ADDITIONS?**

15 **A.** As explained more fully in witness Smith's testimony, siting the Proposed  
 16 Facility at Marshall, which currently consists of four coal units, will allow the  
 17 Company to leverage existing gas infrastructure installed with the previous gas  
 18 co-firing project for the two new advanced-class CTs. Once completed, the  
 19 Proposed Facility will allow Units 1 and 2 to retire while Units 3 and 4 will  
 20 continue natural gas co-fired operations into the early 2030s. Furthermore, the

1 Marshall site allows DEC to utilize the Generator Replacement Request  
2 process, which allows the Company to apply to utilize the transmission  
3 interconnection rights at existing coal plants when installing new generation on-  
4 site and connecting to the transmission system at the same point of  
5 interconnection as the generation being replaced. With the ability to leverage  
6 existing transmission, staff, land, permits, security, and gas pipelines, the  
7 Marshall site offers significant savings to customers over greenfield  
8 construction while lessening the impact to the local communities with coal  
9 retirements. More information about the Companies' approach to siting and  
10 leverage brownfield sites, including repurposing retiring coal sites to more  
11 efficiently and cost-effectively interconnect replacement generation can be  
12 found in witness Smith's testimony, CPIRP Chapter 4 (Execution Plan), and in  
13 CPIRP Appendix K (Natural Gas, Low-Carbon Fuels and Hydrogen) and  
14 Appendix L (Transmission System Planning and Grid Transformation).

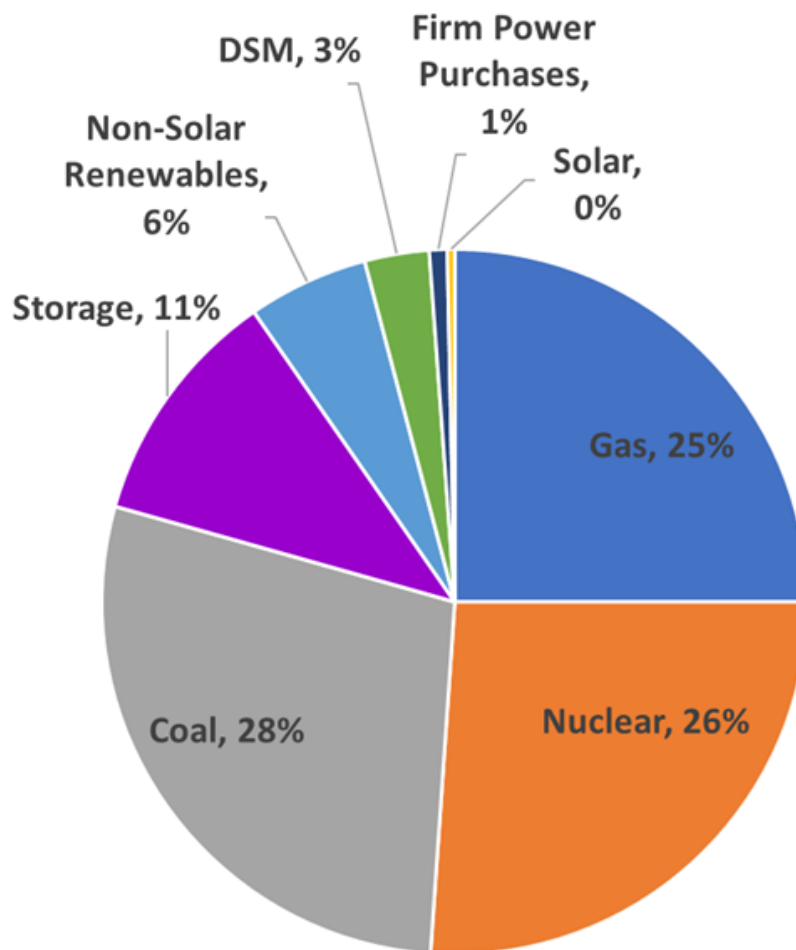
15 **IV. THE PROJECTED UTILIZATION AND OPERATIONS COSTS OF**  
16 **THE PROPOSED FACILITY WITHIN THE FLEET**

17 **Q. PLEASE DESCRIBE DUKE ENERGY CAROLINAS' EXISTING**  
18 **GENERATION RESOURCE PORTFOLIO MIX.**

19 A. Duke Energy Carolinas' generation portfolio is composed of approximately  
20 22,000 MW of firm winter capacity through Company-owned capacity, DSM,  
21 and purchased power capacity. As shown in Figure 5 below, DEC's firm winter  
22 capacity mix consists of approximately 25% gas-fired generating capacity, 26%  
23 nuclear generating capacity, 28% coal-fired generating capacity, and the

1 remainder in storage, non-solar renewables, DSM, firm power purchases, and  
 2 solar.

3 **Figure 5: CPIRP P3 Fall Base – 2024 DEC Firm Winter Capacity Mix<sup>7</sup>**

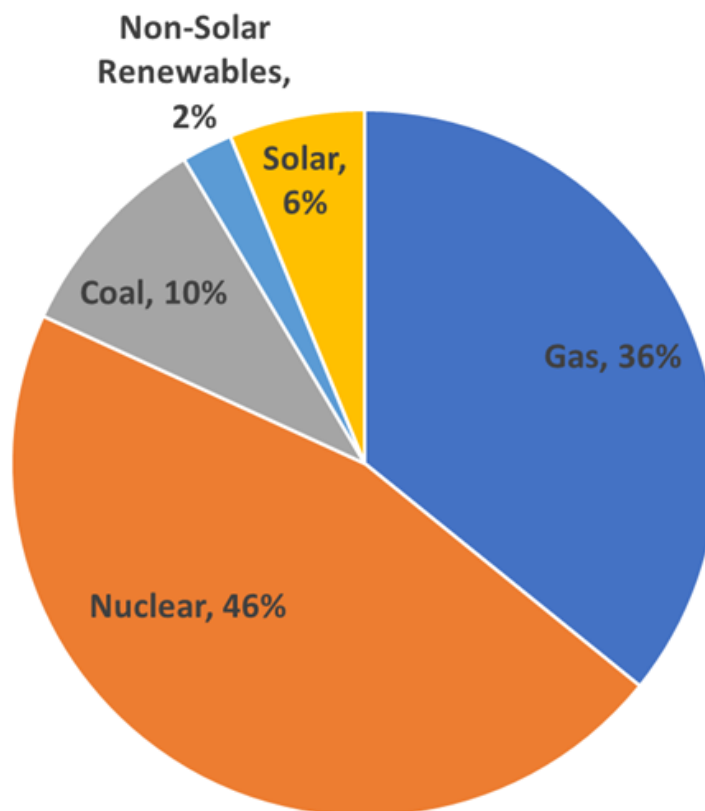


4  
 5 The following Figure 6 illustrates the projected 2024 energy by fuel type  
 6 for the Companies' combined systems. This chart incorporates the Joint  
 7 Dispatch Agreement ("JDA") which represents a non-firm energy-only  
 8 commitment between DEC and DEP. While DEC's capacity mix is roughly

<sup>7</sup> Gas category includes oil-fired CT capacity.

1 25% gas-fired, 26% nuclear, and 28% coal, the energy mix for the Companies’  
2 combined systems is roughly 36% gas-fired generation, 46% nuclear  
3 generation, and 10% coal-fired generation.

4 **Figure 6: CPIRP P3 Fall Base – 2024 Projected DEC+DEP Energy Mix**<sup>8</sup>



5

6 **Q. WILL THE PROPOSED FACILITY CONTRIBUTE TO RESOURCE**  
7 **AND FUEL DIVERSITY?**

8 A. Yes. Today, peaking CT resources are approximately 15% of DEC’s firm winter  
9 capacity mix. The retiring Marshall coal units are projected to operate generally  
10 only during high load periods through their projected retirement dates. The

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<sup>8</sup> Gas category includes oil-fired generation.

1 Proposed Facility's advanced-class CTs will be able to more efficiently and  
2 flexibly meet the peaking needs of the system with shorter required start-up and  
3 minimum online times compared to the Companies' existing fleet. While the  
4 projected 2024 energy mix represents natural gas as the second largest portion  
5 of the system, peaking CT resources make up a small portion of overall  
6 generation for the system due to their limited utilization. Over time, the energy  
7 contribution from natural gas generation, and peaking resources specifically,  
8 continues to decrease as more solar and wind resources are brought online, but  
9 the new CTs will continue to play a critical role by providing flexibility for the  
10 system to respond to rapidly changing load and variable energy resources while  
11 providing a dispatchable back-stand for the system, as further described in  
12 CPIRP Appendix M. Importantly, even as DEC's utilization of these resources  
13 continues to decrease, this type of dispatchable generation provides the reliable  
14 capacity in system peak load conditions, especially in the winter mornings when  
15 generation from solar is limited. To further support the fuel supply diversity of  
16 the system, the Proposed Facility will be dual-fuel capable with available  
17 operation on ULSD.

18 In 2029, when the Proposed Facility comes online, CTs are expected to  
19 make up approximately 19% of the firm winter capacity of the DEC system,  
20 while overall, gas-fired capacity will represent 29% of the firm capacity of the  
21 system. At this time, nuclear will represent 24%, while coal generation will be  
22 reduced from 28% to 21% of the firm winter capacity of the system, which

1 represents a diversified fuel supply and resource mix, while executing an  
2 orderly retirement of coal capacity.

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

5 A. The Proposed Facility is projected to operate as a peaking resource, with  
6 generally low utilization factors, but its dispatchable capacity is critically  
7 important to achieving the Companies' target 22% planning reserve margin over  
8 time and towards maintaining or improving the reliability of the system overall.  
9 The times when the Proposed Facility will be called on to operate will be in  
10 response to higher loads during extreme weather events and it will serve as  
11 flexible generation or as a reliability back stand to variable energy or energy  
12 limited resources, as described in CPIRP Appendix M. The Proposed Facility's  
13 estimated nominal winter capacity of 850 MW, along with its dual-fuel  
14 capability, will contribute to the capacity needs of the system, allowing for the  
15 retirement of Marshall coal-fired Units 1 and 2, while providing more capacity  
16 than Marshall coal-fired Units 1 and 2 to continue to contribute to the capacity  
17 requirements for the system. Exhibit 1B to the Application provides additional  
18 information on need for the Proposed Facility and how it will operate as part of  
19 the system over time.

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

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

7 **Q. DID THE COMPANY CONSIDER ANY OTHER FACTORS IN**  
8 **DETERMINING THAT THE PROPOSED FACILITY**  
9 **APPROPRIATELY BALANCES LEAST COST-PLANNING, CO<sub>2</sub>**  
10 **REDUCTION COMPLIANCE, AND MAINTAINING OR IMPROVING**  
11 **GRID RELIABILITY IN THE CONTEXT OF A RAPIDLY**  
12 **INCREASING LOAD FORECAST?**

13 A. Yes. As highlighted above, the Proposed Facility has been selected as part of  
14 the Companies' proposed Execution Plan and least cost NTAP to reliably serve  
15 customers' future energy needs and construction of the two CT units will also  
16 allow the Company to execute the planned retirement of two aging coal units—  
17 first placed in service almost 60 years ago in 1965 and 1966—and to replace  
18 this capacity with equally reliable generating resources. Siting the Proposed  
19 Facility at Marshall also allows the Company to leverage efficiencies and cost  
20 savings associated with repurposing the retiring coal facility, balancing the  
21 least-cost planning criteria. As previously stated, the new CT resources are  
22 consistent with the 2022 Carbon Plan Order and are consistent with the energy  
23 transition plan in the current 2023 CPIRP, inclusive of the SPA. These filings

1 continue to show the critical role of efficient, hydrogen-capable CTs as a  
2 component of CO<sub>2</sub> reduction trajectory presented in those plans. The selection  
3 of advanced-class CTs reduces technology obsolescence risk, as these resources  
4 are suitable for future conversion to operate exclusively on hydrogen. Hydrogen  
5 conversion, along with several other options, continues to justify the  
6 reasonableness of a 35-year service life and allows consistency between the  
7 Proposed Facility and the Carbon Neutrality requirement by 2050. The  
8 Proposed Facility is expected to be able to be compliant with the proposed EPA  
9 Section 111 Rule for new gas generation as currently proposed, primarily  
10 through limiting utilization to a low load, peaking resource and operation on  
11 “clean fuels.”

## 12 V. CONCLUSION

13 **Q. IN YOUR PROFESSIONAL OPINION, IS THE PROPOSED FACILITY**  
14 **NEEDED AND CONSISTENT WITH THE COMMISSION’S CARBON**  
15 **PLAN ORDER AND THE RESOURCE NEED AND EXECUTION PLAN**  
16 **PRESENTED IN THE CPIRP?**

17 A. Yes. The Proposed Facility is an important and necessary part of DEC’s least-  
18 cost plans to reliably meet its customers’ growing capacity and energy needs  
19 beginning in the 2029 timeframe. Importantly, the Proposed Facility will be  
20 among the most efficient and flexible CT technologies on the market, suitable  
21 for future conversion to operate on carbon-neutral fuels, and facilitates  
22 retirement of the Company’s coal resources, modernizing the region’s



1 generation infrastructure and assisting in the integration of additional renewable  
2 resources. The Proposed Facility is consistent with the least-cost path to achieve  
3 compliance with the authorized CO<sub>2</sub> reduction goals in N.C.G.S. § 62-110.9,  
4 will maintain or improve upon the adequacy and reliability of the existing grid,  
5 and the construction and operation of the facility is in the public interest. The  
6 Company’s comprehensive planning process has identified an “all-of-the-  
7 above” need for resources to meet the requirements under N.C.G.S. § 62-110.9,  
8 and the Proposed Facility is a prudent and least cost component of the  
9 Companies’ Execution Plan to meet the significant capacity additions required  
10 over the planning horizon.

11 **Q. IS THE PROPOSED FACILITY NECESSARY TO PROGRESS TOWARD**  
12 **THE INTERIM TARET OF 70% CO<sub>2</sub> EMISSIONS REDUCTIONS**  
13 **WHILE ALSO ENSURING THE ADEQUACY AND RELIABILITY OF**  
14 **THE GRID ARE MAINTAINED OR IMPROVED?**

15 A. Yes. As I previously noted, the Commission gave “substantial weight” to  
16 witness testimony that the CT resources identified by the Companies are  
17 “essential to achieving the Interim Target, while maintaining or improving  
18 reliability, and doing so along a least cost path[,]” and found persuasive the  
19 Companies’ testimony that “failing to develop new natural gas resources  
20 jeopardizes Duke’s ability to achieve the mandated carbon dioxide emissions  
21 reduction[.]”<sup>9</sup> As discussed above and more fully articulated in the CPIRP, the  
22 Company’s need for new CT resources as part of a least cost plan that maintains

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<sup>9</sup> Carbon Plan Order at 79.

1 reliability and operational resilience has only grown since the Commission  
2 made those observations in the Carbon Plan Order. The Proposed Facility will  
3 provide dispatchable resources with fast ramping capability and firm fuel-  
4 supply to allow the Company to add greater volumes of variable energy and  
5 energy-limited resources its portfolio. As demonstrated by the Companies'  
6 overall CPIRP modeling process and NTAP, the Proposed Facility is needed and  
7 in the best interest of customers to ensure consumer affordability and system  
8 reliability as the system transitions to carbon neutrality by 2050.

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

11 A. Yes, it does.