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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 Carolinas, LLC's Supplemental Testimony
Docket No. E-7, Sub 1282**

Dear Ms. Dunston:

Please find enclosed Duke Energy Carolinas, LLC's Supplemental Testimony of John D. Swez, in the above-referenced proceeding, wherein Mr. Swez summarizes enhanced modeling, otherwise known as dynamic dispatch, which the Company anticipates implementing on or before May 31, 2023. The Company has been in conversations with Public Staff regarding its development of dynamic dispatch and, during those conversations, the Public Staff recommended, and the Company agreed, to file the enclosed supplemental testimony.

If you have any questions, please do not hesitate to contact me. Thank you for your assistance with this matter.

Sincerely,

Ladawn S. Toon

Enclosures

cc: Parties of Record

OFFICIAL COPY

May 05 2023

STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. E-7, SUB 1282

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of)
Application of Duke Energy Carolinas, LLC) **SUPPLEMENTAL TESTIMONY**
Pursuant to G.S. 62-133.2 and NCUC Rule) **OF JOHN D. SWEZ FOR**
R8-55 Relating to Fuel and Fuel-Related) **DUKE ENERGY CAROLINAS, LLC**
Charge Adjustments for Electric Utilities)

1 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2 A. My name is John D. Swez. My business address is 526 S. Tryon Street,
3 Charlotte, North Carolina.

4 **Q. HAVE YOU PREVIOUSLY FILED TESTIMONY IN THIS**
5 **PROCEEDING?**

6 A. Yes, on March 1, 2023, I caused to be pre-filed with the Commission my direct
7 testimony and 4 exhibits.

8 **Q. WHAT IS THE PURPOSE OF YOUR SUPPLEMENTAL TESTIMONY**
9 **IN THIS PROCEEDING?**

10 A. The purpose of this filing is to inform the Commission of enhancements the
11 Company is implementing to optimize the independent 3rd party spot market coal
12 prices used in its daily economic unit commitment and dispatch process to better
13 reflect the market replacement price of coal given the inelasticity of coal supply. The
14 Company refers to this enhanced modeling approach as “dynamic dispatch” and has
15 been in conversations with the Public Staff during its development. The Company is
16 informing the Commission that we are ready to implement this enhancement into our
17 routine Unit Commitment and Dispatch process.

18 **Q. PLEASE DESCRIBE THE COMPANY’S APPROACH TO UNIT**
19 **COMMITMENT AND DISPATCH OF ITS GENERATION ASSETS TO**
20 **RELIABLY AND ECONOMICALLY SERVE ITS CUSTOMERS.**

21 A. As discussed in my direct testimony, both DEC and DEP perform the same detailed
22 daily process utilizing a production cost model to determine the unit commitment plan
23 to economically and reliably meet the Company’s projected system needs over the next

1 seven days. The model minimizes the production costs needed to serve the projected
2 customer demand within reliability and other system constraints. Inputs to the model
3 include, but are not limited to, the following: (1) forecasted customer energy demand;
4 (2) the latest independent 3rd party spot fuel prices, reflective of market supply chain
5 dynamics; (3) variable transportation rates; (4) planned maintenance and refueling
6 outages at the generating units; (5) generating unit performance parameters; (6)
7 reliability constraints such as units run to maintain day-ahead planning reserves or units
8 required to run for transmission or voltage support; (7) expected market conditions
9 associated with power purchases and off-system sales opportunities; and (8) projected
10 variable renewable resource contributions (*i.e.* solar). The production cost model
11 output produces the optimized hourly unit commitment plan for the 7-day forecast
12 period. This unit commitment plan also provides the starting point for dispatch, but
13 dispatch is then also subject to real time adjustments due to changing system
14 conditions, including management of natural gas transportation constraints. The unit
15 commitment plan is prepared daily and adjusted, as needed, throughout any given day
16 to respond to changing real time system conditions.

17 **Q. PLEASE EXPLAIN HOW THE COMPANY'S FORECASTED FUEL PRICES**
18 **ARE REFLECTIVE OF MARKET SUPPLY CHAIN DYNAMICS.**

19 A. Incremental fuel replacement prices are a key input in determining the unit
20 commitment plan that economically and reliably meets the Company's projected
21 system needs over the next seven days. To ensure that the rapidly rising cost and
22 limited availability of incremental replacement coal was adequately reflected in the
23 unit commitment model inputs, in late 2021, the Company began meeting weekly to
24 review the independent 3rd party spot coal market price input against the next seven

1 and thirty day expected coal burns and deliveries to determine which input price,
2 domestic bid, offer or export was the most reflective of the current market supply
3 availability conditions.

4 **Q. DOES THE COMPANY BELIEVE THIS MANUAL APPROACH TO**
5 **REFLECTING MARKET SUPPLY CHAIN DYNAMICS IN THE**
6 **FORECASTED FUEL PRICES IS THE BEST APPROACH OVER THE LONG**
7 **TERM GIVEN THE INELASTICITY OF COAL SUPPLY?**

8 A. No. The Company has been working on an updated model-driven approach that
9 incorporates a coal price input that reflects the realities of the inelasticity of coal supply
10 and the Company's need to manage within inventory bounds while minimizing
11 customer costs and ensuring fuel security. Given the inability of the coal supply chain
12 to respond timely to changes in demand, along with the transition of the domestic
13 utility generation fleet away from coal as baseload generation, the Company
14 recognized there was a need to enhance the existing unit commitment and dispatch coal
15 price input process to reflect longer term coal market realities and operational risks
16 over time. This enhanced approach—which the Company is calling “dynamic
17 dispatch”—reflects an optimized coal price input approach that aligns spot coal market
18 prices with longer term supply, delivery, and inventory planning to cost effectively
19 reduce volatility in seasonal and annual fuel inventories. The dynamic dispatch process
20 will generate an optimized coal price input for unit commitment and dispatch that
21 minimizes system cost over the near-term fuel planning horizon while integrating the
22 forward-looking forecasted coal delivery plan and inventory balances into the current
23 coal price input process for updating weekly coal prices for unit commitment and
24 dispatch.

1 **Q. HOW DOES THE COMPANY DETERMINE THE OPTIMIZED COAL PRICE**
2 **INPUT TO USE IN UNIT COMMITMENT AND DISPATCH?**

3 A. To determine the optimized coal price input, the Company starts from the current
4 stochastic fuel burn projection across a near-term fuel procurement horizon (typically
5 12 to 18 months ahead), that is based on current market pricing and is independent of
6 station inventory considerations. From these initial coal burn scenarios, a mean
7 optimized burn and inventory forecast is generated for each coal and dual fuel
8 operating station based on 100 simulations of burn projections and the Companies’
9 forecasted coal deliveries. If the stochastic simulations result in projected coal
10 inventories which fall below station minimum or exceed maximum storage limits, a
11 series of further optimization steps is performed. First, the model assesses whether
12 contractual inventory management options (such as re-balancing deliveries between
13 stations, exercising “flex” provisions in contracts, deferring a limited volume of
14 contracted deliveries, or accelerating deliveries) can alleviate the inventory constraints.
15 If those options are unable to alleviate the inventory constraints, then coal price inputs
16 are optimized to bring projected inventories within limits at impacted coal plants.

17 **Q. PLEASE PROVIDE A BRIEF DESCRIPTION OF THE COMPANY’S**
18 **STOCHASTIC PRODUCTION COST MODEL.**

19 A. The stochastic model uses historic weather information to simulate numerous scenarios
20 of future weather and commodity prices. For each of these scenarios, system load and
21 commodity prices (gas, coal, oil, and power) are all calculated in a correlated manner
22 using historical correlations with each other and with weather. The resulting forecasts
23 give the Company not only expected fuel burns, but also the range of fuel burns and
24 the probability associated with each range.

1 **Q. IS THE COMPANY CHANGING THE ECONOMIC UNIT COMMITMENT**
2 **AND DISPATCH METHODOLOGY?**

3 A. The unit commitment and dispatch process described above and in my direct testimony
4 is not changing. The enhanced dynamic dispatch process is providing the economic
5 unit commitment and dispatch production cost model with an optimized spot coal price
6 input to use if needed to maintain projected inventories within limits at impacted coal
7 plants. The use of this optimized spot coal price input maintains least cost economics
8 by calculating incremental adjustments needed over a longer time horizon to maintain
9 plant inventories within safety and reliability limits, while minimizing fuel security
10 risk and total long term system costs for customers. The dynamic dispatch process
11 also proactively reduces the need for more reactive approaches such as uneconomic
12 unit commitment and dispatch and contractual buyouts.

13 **Q. DOES DYNAMIC DISPATCH IMPACT THE COMPANY'S INTERGRATED**
14 **RESOURCE PLANNING PROCESS?**

15 A. No, dynamic dispatch is optimizing the spot coal price input for the existing fleet.

16 **Q. WHEN DOES THE COMPANY EXPECT TO TRANSITION TO THIS**
17 **DYNAMIC DISPATCH METHODOLOGY?**

18 A. The Company is planning to implement this optimized coal input price process no later
19 than May 31, 2023. The implementation of the coal price adjustment is timely, as
20 current coal inventory projections are forecasted to exceed station capabilities due to a
21 dramatic decline in coal burns resulting from a warmer than expected winter and low
22 natural gas prices. The Company has utilized its available commercial options, and
23 dynamic dispatch is now the most effective option to manage coal supply and coal

1 inventories within reliability and safety limits while maintaining longer term fuel
2 security for customers.

3 **Q. DOES THIS CONCLUDE YOUR PRE-FILED SUPPLEMENTAL**
4 **TESTIMONY?**

5 A. Yes, it does.

CERTIFICATE OF SERVICE

I certify that a copy of Duke Energy Carolinas, LLC's Supplemental Testimony, in Docket No. E-7, Sub 1282, has been served by electronic mail, hand delivery or by depositing a copy in the United States mail, postage prepaid to the parties of record.

This the 5th day of May, 2023.



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