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	DIRECT TESTIMONY
Pursuant to G.S. 62-133.2 and NCUC Rule	OF SIGOURNEY CLARK 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 Sigourney Clark. My business address is 5413 Shearon Harris
- Road, New Hill, North Carolina.
- 4 Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?
- 5 A. I am a Rates and Regulatory Strategy Manager for Duke Energy Carolinas, LLC
- 6 ("DEC" or the "Company").
- 7 Q. PLEASE SUMMARIZE YOUR EDUCATION AND PROFESSIONAL
- **QUALIFICATIONS.**
- 9 A. I received my Bachelor of Science, focused in Finance and Accounting, from
- North Carolina State University, and I received a Master of Business
- Administration degree from East Carolina University. I began my career in 2013
- with Duke Energy at the Shearon Harris Nuclear Power Plant, and I have held
- various roles, most recently Senior Project Controls Specialist. I joined the Rates
- Department in 2022 as Rates and Regulatory Strategy Manager.
- 15 O. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE NORTH
- 16 CAROLINA UTILITIES COMMISSION?
- 17 A. No. I have not.
- 18 Q. ARE YOU FAMILIAR WITH THE ACCOUNTING PROCEDURES AND
- 19 **BOOKS OF ACCOUNT OF DEC?**
- 20 A. Yes. DEC's books of account follow the uniform classification of accounts
- prescribed by the Federal Energy Regulatory Commission ("FERC").
- 22 O. WHAT IS THE PURPOSE OF YOUR TESTIMONY?
- 23 A. The purpose of my testimony is to present the information and data required by

1		North Carolina General Statutes ("N.C. Gen. Stat.") § 62-133.2(c) and (d) and
2		Commission Rule R8-55, as set forth in Clark Exhibits 1 through 6, along with
3		supporting work papers. The test period used in supplying this information and
4		data is the twelve months ended December 31, 2022 ("test period"), and the billing
5		period is September 1, 2023 through August 31, 2024 ("billing period").
6	Q.	WHAT IS THE SOURCE OF THE ACTUAL INFORMATION AND
7		DATA FOR THE TEST PERIOD?
8	A.	Actual test period kilowatt hour ("kWh") generation, kWh sales, fuel-related
9		revenues, and fuel-related expenses were taken from DEC's books and records.
10		These books, records, and reports of DEC are subject to review by the appropriate
11		regulatory agencies in the three jurisdictions that regulate DEC's electric rates. In
12		addition, independent auditors perform an annual audit to provide assurance that,
13		in all material respects, internal accounting controls are operating effectively and
14		DEC's financial statements are accurate.
15	Q.	WERE CLARK EXHIBITS 1 THROUGH 6 PREPARED BY YOU OR AT
16		YOUR DIRECTION AND UNDER YOUR SUPERVISION?
17	A.	Yes, these exhibits were either prepared by me or at my direction and under my
18		supervision, and consist of the following:
19		Exhibit 1: Summary Comparison of Fuel and Fuel-Related Costs Factors.
20		Exhibit 2:
21		Schedule 1: Fuel and Fuel-Related Costs Factors - reflecting a
22		93.52% proposed nuclear capacity factor and
23		projected megawatt hour ("MWh") sales.

1		Schedule 2:	Fuel and Fuel-Related Costs Factors - reflecting a
2			93.52% nuclear capacity factor and normalized
3			test period sales.
4		Schedule 3:	Fuel and Fuel-Related Costs Factors - reflecting a
5			91.87% North American Electric Reliability
6			Corporation ("NERC") five-year national
7			weighted average nuclear capacity factor for
8			pressurized water reactors and projected billing
9			period MWh sales.
10	Exhibit 3:		
11		Page 1: Ca	lculation of the Proposed Composite Experience
12		Mo	odification Factor ("EMF") rate.
13		Page 2: Ca	lculation of the EMF for residential customers.
14		Page 3: Ca	lculation of the EMF for general service/lighting
15		cus	stomers.
16		Page 4: Ca	lculation of the EMF for industrial customers.
17	Exhibit 4:	MWh Sales,	Fuel Revenue, and Fuel and Fuel-Related Expense,
18		as well as Sys	stem Peak for the test period.
19	Exhibit 5:	Nuclear Capa	acity Ratings.
20	Exhibit 6:	December 20	22 Monthly Fuel Reports.
21		1) Decer	mber 2022 Monthly Fuel Report required by NCUC
22		Rule	R8-52.
23		2) Decei	mber 2022 Monthly Base Load Power Plant

2 Q. PLEASE EXPLAIN CLARK EXHIBIT 1.

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A.

3 Clark Exhibit 1 presents a summary of fuel and fuel-related cost factors, including A. 4 the current fuel and fuel-related cost factors, the fuel and fuel-related cost factor 5 calculations as required under Rule R8-55, and the proposed fuel and fuel-related 6 cost factors.

7 WHAT FUEL AND FUEL-RELATED COSTS FACTORS DOES DEC Q.

8 PROPOSE FOR INCLUSION IN RATES FOR THE BILLING PERIOD?

DEC proposes fuel and fuel-related costs factors for residential, general service/lighting, and industrial customers of 4.3770¢, 3.9202¢, and 3.4394¢ per kWh, respectively, to be reflected in rates during the billing period. The factors DEC proposes in this proceeding incorporate a 93.52% nuclear capacity factor as testified to by Company witness Capps, projected fossil fuel costs as testified to by Company witness Swez, projected nuclear fuel costs as testified to by Company witness Houston, and projected reagents costs as testified to by Company witness Flanagan. The components of the proposed fuel and fuel-related cost factors by customer class, as shown on Clark Exhibit 1, are as follows:

	Residential	General	Industrial	Composite
Description	cents/kWh	cents/kWh	cents/kWh	cents/kWh
Total adjusted Fuel and Fuel Related Costs	2.7126	2.2553	1.7127	2.3202
EMF Increment (Decrement)	1.6644	1.6649	1.7267	1.6774
EMF Interest (Decrement)	-	-	-	-
Net Fuel and Fuel Related Costs Factors	4.3770	3.9202	3.4394	3.9976

19 WHAT IS THE IMPACT TO CUSTOMERS' BILLS IF THE PROPOSED Q 20 FUEL AND FUEL-RELATED COSTS FACTORS ARE APPROVED BY 21

THE COMMISSION?

1 A. The proposed fuel and fuel-related costs factors will result in a 17.99% increase
2 on customers' bills. The table below shows both the proposed and existing fuel
3 and fuel-related costs factors.

	Residential	General	Industrial	Composite
Description	cents/kWh	cents/kWh	cents/kWh	cents/kWh
Proposed Total Fuel Factor	4.3770	3.9202	3.4394	3.9976
Existing Total Fuel Factor	2.4866	2.4471	2.4122	2.4607
Increase in Fuel Factor	1.8904	1.4731	1.0272	1.5369

5 Q. WHAT ARE THE KEY DRIVERS IMPACTING THE PROPOSED FUEL

AND FUEL-RELATED COSTS FACTORS?

A.

The increase in the proposed net fuel and fuel-related costs factors is primarily driven by a \$999 million under-recovery in the current test period compared to a \$327 million under-recovery included in current rates. The Company typically experiences some amount of over or under recovered fuel costs during the test period. The EMF provision of fuel rates was established to address the differences between fuel revenues realized and fuel costs incurred during a test period. Fuel revenues collected by the Company were materially less than the fuel costs incurred for the test period. Witness Swez describes the trend of increasing fuel commodity prices that continued throughout 2022, which led to the \$999 million under-recovery experienced during the test period reflected in DEC's proposed EMF rates. In addition to the material under-recovery, estimated system fuel costs in the billing period are higher due to an expected increase in customer load.

Q. HOW DOES DEC DEVELOP THE FUEL FORECASTS FOR ITS GENERATING UNITS?

A. For this filing, DEC used an hourly dispatch model in order to generate its fuel

forecasts. This hourly dispatch model considers the latest forecasted fuel prices,
outages at the generating units based on planned maintenance and refueling
schedules, forced outages at generating units based on historical trends, generating
unit performance parameters, and expected market conditions associated with
power purchases and off-system sales opportunities. In addition, the model
dispatches DEC's and DEP's generation resources via joint dispatch, which
optimizes the generation fleets of DEC and DEP for the benefit of customers.

Q. PLEASE EXPLAIN WHAT IS SHOWN ON CLARK EXHIBIT 2, SCHEDULES 1, 2, AND 3, INCLUDING THE NUCLEAR CAPACITY FACTORS.

Exhibit 2 is divided into three schedules. Schedule 1 sets forth system fuel costs used in the determination of the prospective fuel and fuel-related costs. The calculation uses the nuclear capacity factor of 93.52% and provides the forecasted MWh sales for the billing period on which system generation and costs are based. Forecasted generation and purchased power associated with the Company's CPRE Program, established by N.C. Gen. Stat § 62-110.8 and approved by this Commission in Docket No. E-7, Sub 1156, used to supply the Company's native load has been included in Exhibit 2, as part of total system generation to supply native load sales. Recovery of the purchased and generated power costs associated with CPRE generation and purchased power are included in the Company's Rider CPRE filing in Docket No. E-7, Sub 1281.

Schedule 2 also uses the proposed capacity factor of 93.52% along with normalized test period kWh generation, as prescribed by NCUC Rule R8-55

(e)(3), which requires the use of the methodology adopted by the Commission in
DEC's last general rate case.

The capacity factor shown on Schedule 3 is prescribed in NCUC Rule R8-55(d)(1). The normalized five-year national weighted average NERC nuclear capacity factor is 91.87%. This capacity factor is based on the 2017 through 2021 data reported in the NERC Generating Unit Statistical Brochure for pressurized water reactors rated at and above 800 MWs. Projected billing period kWh generation was also used for Schedule 3 per NCUC Rule R8-55 (d)(1).

Page 2 of Exhibit 2, Schedules 1, 2, and 3 presents the calculation of the proposed fuel and fuel-related costs factors by customer class resulting from the allocation of renewable and cogeneration power capacity costs by customer class on the basis of the final 2021 cost of service production plant allocators since the 2022 cost of service study is not available at the time of filing. When this allocator becomes known, DEC may elect to make a supplemental filing to adjust its proposed billing period rates, if the estimated rates are materially impacted.

Page 3 of Exhibit 2, Schedules 1, 2, and 3 shows the allocation of system fuel costs to the North Carolina retail jurisdiction, and the calculation of DEC's proposed fuel and fuel-related costs factors for the residential, general service/lighting and industrial classes, exclusive of regulatory fee, using the uniform percentage average bill adjustment method.

Q. PLEASE SUMMARIZE THE METHOD USED TO ADJUST TEST PERIOD KWH GENERATION IN CLARK EXHIBIT 2, SCHEDULES 2 AND 3.

- The methodology used by DEC in its most recent general rate case for determining generation mix is based upon generation dispatch modeling as used on Clark Exhibit 2, Schedule 1. For purposes of this filing, as a proxy for generation dispatch modeling, Clark Exhibit 2, Schedules 2 and 3 adjust the coal generation produced by the dispatch model. For example, on Exhibit 2, Schedule 2, which is based on the proposed capacity factor and normalized test period sales, DEC decreased the level of coal generation to account for the difference between forecasted generation and normalized test period generation. On Exhibit 2, Schedule 3, which is based on the NERC capacity factor, DEC increased the level of coal generation to account for the decrease in nuclear generation. The decrease in nuclear generation results from assuming a 91.87% NERC nuclear capacity factor compared to the proposed 93.52% nuclear capacity factor.
- Q. CLARK EXHIBIT 3 SHOWS THE CALCULATION OF THE TEST
 PERIOD (OVER)/UNDER RECOVERY BALANCE AND THE EMF
 RATE. HOW DID FUEL EXPENSES COMPARE WITH FUEL
 REVENUE DURING THE TEST PERIOD?
 - A. Clark Exhibit 3, Pages 1 through 4, demonstrates that for the test period, DEC experienced an under-recovery for the residential, general service/lighting and industrial customer classes of \$381 million, \$407 million and \$211 million respectively. There is one adjustment included in the calculation of the under-recovery balance at December 31, 2022. This adjustment relates to the month of January 2022, which was included in the fuel rate approved in the last fuel and fuel-related cost recovery proceeding and is included for Commission review in

the current proceeding. The Company has excluded the amount of under-recovery for January 2022 that was included in the EMF approved in Docket E-7, Sub 1263 when computing the proposed EMF factors.

The (over)/under recovery amount was determined each month by comparing the amount of fuel revenue collected for each class to actual fuel and fuel-related costs incurred by class. The revenue collected is based on actual monthly sales for each class. Actual fuel and fuel-related costs incurred were first allocated to the NC retail jurisdiction based on jurisdictional sales, with consideration given to any fuel and fuel-related costs or benefits that should be directly assigned. The North Carolina retail amount is further allocated among customer classes as follows: (1) capacity-related purchased power costs were allocated among customer classes based on production plant allocators from DEC's cost of service study and (2) all other fuel and fuel-related costs were allocated among customer classes based on fixed allocation percentages established in DEC's previous fuel and fuel-related cost recovery proceeding based on the uniform percentage average bill adjustment method.

The Company typically experiences some amount of (over)/under recovery of fuel costs during the test period. The EMF provision of fuel rates was established to address the differences between fuel revenues realized and fuel costs incurred during a test period. Throughout the entirety of 2022, fuel revenues collected by the Company were materially less than the fuel costs incurred for the test period. Witness Swez describes the trend of increasing fuel commodity prices that continued throughout 2022, driving the under-recovery experienced during

- the test period. In addition to the material under-recovery, estimated system fuel costs are higher in the billing period due to an expected increase in customer load.
- 3 Q. PLEASE EXPLAIN CLARK EXHIBIT 4.
- 4 As required by NCUC Rule R8-55(e)(1) and (e)(2), Clark Exhibit 4 sets forth test A. 5 period actual MWh sales, the customer growth MWh adjustment, and the weather 6 MWh adjustment. Test period MWh sales were normalized for weather using a 7 30-year period and adjusted for projected customer growth. Both of these adjustments were determined using the methods approved for use in DEC's last 8 9 general rate case (Docket No. E-7, Sub 1214) and used in its last fuel proceeding. 10 Clark Exhibit 4 also sets forth actual test period fuel-related revenue and fuel 11 expense on a total DEC basis and for North Carolina retail. The test period peak 12 demand data for the system and for NC retail customer classes, typically included 13 on Exhibit 4, is not available at the time of this filing. The Company will make a 14 supplemental filing to update Exhibit 4 to include this data when it becomes 15 available.
- 16 O. PLEASE EXPLAIN CLARK EXHIBIT 5.
- 17 A. Clark Exhibit 5 sets forth the capacity ratings for each of DEC's nuclear units, in compliance with Rule R8-55(e)(12).
- 19 Q. DO YOU BELIEVE DEC'S FUEL AND FUEL-RELATED COSTS
 20 INCURRED IN THE TEST YEAR ARE REASONABLE?
- 21 A. Yes. As shown on Clark Exhibit 6, DEC's test year actual fuel and fuel-related 22 costs were 3.5402¢ per kWh. Key factors in DEC's ability to maintain lower fuel 23 and fuel-related rates for the benefit of customers include (1) its diverse generating

portfolio mix of nuclear, coal, natural gas, and hydro; (2) the high capacity factors
of its nuclear fleet; and (3) fuel procurement strategies that mitigate volatility in
supply costs. Other key factors include the combination of DEC's and DEP's
respective skills in procuring, transporting, managing, and blending fuels,
procuring reagents and the increased and broader purchasing ability of Duke
Energy Corporation after its merger with Progress Energy, Inc., as well as the joint
dispatch of DEC's and DEP's generation resources. Company witness Capps
discusses the performance of DEC's nuclear generation fleet, and Company
witness Flanagan discusses the performance of the fossil and hydro fleet, as well
as the use of chemicals for reducing emissions. Company witness Swez discusses
fossil fuel procurement strategies, and Company witness Houston discusses
DEC's nuclear fuel costs and procurement strategies.

Q. HAS THE COMPANY REVIEWED ITS FUEL COST PROXY PERCENTAGE CALCULATION FOR 2022?

Yes, based on the analysis of the composite (i.e., DEC and DEP combined) 2022 short-term off-system sales, the actual fuel and fuel-related ratio of such sales was 87.9% of total sales revenues. Given that the results of the analysis fall outside the range of 75% to 85%, the ratio will be adjusted down to the maximum of the range as in accordance with the Stipulation Regarding the Proper Methodology for Determining the Fuel Costs Associated with Power Purchases from Power Marketers and Others (Swez Exhibit 4). Accordingly, the Company proposes setting fuel costs associated with power purchases made

1		by the Company in calendar year 2022 at a level equal to 85% of the total energy
2		cost as reflected in Clark Exhibit 6 Schedule 3, Page 3 of 5.
3	Q.	IN DEVELOPING THE PROPOSED FUEL AND FUEL-RELATED
4		COSTS FACTORS, WERE THE FUEL COSTS ALLOCATED IN
5		ACCORDANCE WITH N.C. GEN. STAT. § 62-133.2(A2)?
6	A.	Yes, the costs for which statutory guidance is provided are allocated in compliance
7		with N.C. Gen. Stat. § 62-133.2(a2). These costs are described in subdivisions
8		(4), (5), (6), (10) and (11) of N.C. Gen. Stat. § 62-133.2(a1). Subdivisions (4),
9		(6), (10) and (11) address purchased power non-capacity costs. Subdivisions (5),
10		(6), (10) and (11) address purchased power capacity costs. The allocation methods
11		for these costs are as follows:
12		(a) Capacity-related purchased power costs in Subdivisions (5), (6), (10)
13		and (11) are allocated based upon the final 2021 cost of service production plant
14		allocators since the 2022 cost of service study is not available at the time of filing.
15		During the billing period, when DEC computes its actual fuel costs for comparison
16		to fuel revenues realized, DEC will use the appropriate production plant allocator
17		from the 2022 cost of service study in determining North Carolina retail's share
18		of actual costs by customer class. In addition, when this allocator becomes known,
19		DEC may elect to make a supplemental filing to adjust its proposed billing period
20		rates, if the estimated rates are materially impacted.
21		(b) Non-capacity related purchased power costs in Subdivisions (4), (6),
22		(10) and (11) are allocated in the same manner as all other fuel and fuel-related
23		costs, using a uniform percentage average bill adjustment method.

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2 ALLOCATED FOR WHICH THERE IS NO SPECIFIC GUIDANCE IN

- 3 N.C. GEN. STAT. § 62-133.2(A2)?
- 4 A. System costs are allocated to the NC retail jurisdiction based on jurisdictional
- sales, with consideration given to any fuel and fuel-related costs or benefits that
- should be directly assigned. Costs are further allocated among customer classes
- 7 using the uniform percentage average bill adjustment methodology in setting fuel
- 8 rates in this fuel proceeding. DEC proposes to use the same uniform percentage
- 9 average bill adjustment methodology to adjust its fuel rates to reflect a proposed
- increase in fuel and fuel-related costs as it did in its 2022 fuel and fuel-related cost
- recovery proceeding in Docket No. E-7, Sub 1263.
- 12 Q. PLEASE EXPLAIN THE CALCULATION OF THE UNIFORM
- 13 PERCENTAGE AVERAGE BILL ADJUSTMENT METHOD SHOWN
- ON CLARK EXHIBIT 2, PAGE 3 OF SCHEDULES 1, 2, AND 3.
- 15 A. Clark Exhibit 2, Page 3 of Schedule 1, shows DEC's proposed fuel and fuel-
- related cost factors for the residential, general service/lighting and industrial
- 17 classes, exclusive of regulatory fee. The uniform bill percentage change of
- 18 17.99% was calculated by dividing the fuel and fuel-related cost increase of
- 19 \$934,815,271 for North Carolina retail by the normalized annual North Carolina
- retail revenues at current rates of \$5,195,519,969. The cost increase of
- \$934,815,271 was determined by comparing the total proposed fuel rate per kWh
- 22 to the total fuel rate per kWh currently being collected from customers and
- 23 multiplying the resulting increase in fuel rate per kWh by projected North Carolina

retail kWh sales for the billing period. The proposed fuel rate per kWh represents
the rate necessary to recover projected period fuel costs for the billing period (as
computed on Clark Exhibit 2, Schedule 1) and the proposed composite EMF
increment rate (as computed on Clark Exhibit 3, page 1). This results in a uniform
bill percentage change of 17.99% Clark Exhibit 2, Page 3 of Schedules 2 and 3
uses the same calculation, but with the methodology as prescribed by NCUC Rule
R8-55(e)(3) and NCUC Rule R8-55(d)(1), respectively.

9 FOR EACH CUSTOMER CLASS DERIVED FROM THE UNIFORM 10 PERCENT ADJUSTMENT COMPUTED ON CLARK EXHIBIT 2, PAGE 11 3 OF SCHEDULES 1, 2, AND 3?

Clark Exhibit 2, Page 3 of Schedules 1, 2, and 3 uses the same calculation, but with the methodology as prescribed by NCUC Rule R8-55(e)(3) and NCUC Rule R8-55 (d)(1), respectively, with the breakdown shown on Clark Exhibit 2, Page 2 of Schedules 2 and 3. The equal percent increase or decrease for each customer class is applied to current annual revenues by customer class to determine a dollar amount of increase or decrease for each customer class. The dollar increase or decrease is divided by the period sales for each class (either projected billing period or adjusted test period) to derive a cents per kWh increase or decrease. The current total fuel and fuel-related cost factors for each class are increased or decreased by the proposed cents per kWh increases or decreases to get the proposed total fuel and fuel-related cost factors. The proposed total factors are then separated into the prospective and EMF components by subtracting the EMF

- 1 components for each customer class (as computed on Clark Exhibit 3, Page 2, 3,
- and 4) to derive the prospective component for each customer class. This
- 3 breakdown is shown on Clark Exhibit 2, Page 2 of Schedules 1, 2, and 3.
- 4 Q. HAS DEC'S ANNUAL INCREASE IN THE AGGREGATE AMOUNT OF
- 5 THE COSTS IDENTIFIED IN SUBDIVISIONS (4), (5), (6), (10) AND (11)
- 6 OF N.C. GEN. STAT. § 62-133.2(a1) EXCEEDED 2.5% OF ITS NORTH
- 7 CAROLINA RETAIL GROSS REVENUES FOR THE TEST PERIOD?
- 8 A. No. N.C. Gen. Stat. § 62-133.2(a2) limits the amount of annual increase in certain
- 9 purchased power costs identified in § 62-133.2(a1) that DEC can recover to 2.5%
- of its North Carolina retail gross revenues for the preceding calendar year. The
- amount recoverable in DEC's proposed rates for purchased power under the
- relevant sections of N.C. Gen. Stat. § 62-133.2(a1) does not increase by more than
- 2.5% of DEC's gross revenues for its North Carolina retail jurisdiction for the test
- period.
- 15 Q. HAS DEC FILED WORK PAPERS SUPPORTING THE
- 16 CALCULATIONS, ADJUSTMENTS, AND NORMALIZATIONS AS
- 17 REQUIRED BY NCUC RULE R8-55(E)(11)?
- 18 A. Yes. The work papers supporting the calculations, adjustments and
- 19 normalizations are included with the filing in this proceeding.
- 20 Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?
- A. Yes, it does.