

1 PLACE: Dobbs Building, Raleigh, North Carolina

2 DATE: September 19, 2017

3 DOCKET NO.: E-2, Sub 1146

4 TIME IN SESSION: 9:30 A.M. TO 9:41 A.M.

5 BEFORE: Chairman Edward S. Finley, Jr., Presiding

6 Commissioner Bryan E. Beatty

7 Commissioner ToNola D. Brown-Bland

8 Commissioner Jerry C. Dockham

9 Commissioner James G. Patterson

10 Commissioner Lyons Gray

11 Commissioner Daniel G. Clodfelter

12

13 IN THE MATTER OF:

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15 Application of Duke Energy Progress, LLC,

16 Pursuant to G.S. 62-133.2 and Commission Rule R8-55

17 Regarding Fuel and Fuel-Related Cost Adjustments

18 for Electric Utilities

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**FILED**

**OCT 04 2017**

**Clerk's Office  
N.C. Utilities Commission**

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## 1 P R O C E E D I N G S

2 CHAIRMAN FINLEY: Let's come to order, please.

3 Good morning. My name is Edward Finley, and with me this  
4 morning are Commissioners Bryan E. Beatty, ToNola D.  
5 Brown-Bland, Jerry C. Dockham, James C. Patterson, Lyons  
6 Gray, and Daniel G. Clodfelter. And I'll call for  
7 hearing Docket Number E-2, Sub 1146, which is the  
8 Application by Duke Energy Progress, Pursuant to G.S. 62-  
9 133.2 and Commission Rule R8-55, Regarding Fuel and Fuel-  
10 Related Cost Adjustments for Electric Utilities.

11 On June 21, 2017, Duke filed its -- Duke  
12 Progress filed its Application to Adjust Fuel and Fuel-  
13 Related Cost Component of Electric Rates with the  
14 testimony, exhibits, and workpapers of Kendra A. Ward,  
15 and the testimony and exhibits of Brett Phipps, Joseph A.  
16 Miller, Jr., T. Preston Gillespie, Jr., and Kenneth D.  
17 Church.

18 On July 6, 2017, the Commission issued its  
19 Order Scheduling the Hearing, Requiring Filing of  
20 Testimony, Establishing Discovery Guidelines, and  
21 Requiring Public Notice.

22 Petitions to Intervene have been filed and  
23 granted for Carolina Industrial Group for Fair Utility  
24 Rates II, the North Carolina Sustainable Energy

1 Association, and Carolina Utility Customers Association,  
2 Inc.

3 On September 6, 2016, Duke Progress filed the  
4 supplemental testimony -- that's Duke -- filed the  
5 supplemental testimony and exhibits of Kendra A. Ward and  
6 the -- and to incorporate revisions of the fuel  
7 adjustment process included in the recently enacted House  
8 Bill 589.

9 On September 7, 2017, the Public Staff filed  
10 the testimony of Darlene P. Peedin and Dustin R. Metz,  
11 presenting the results of the Public Staff's  
12 investigation of the proposed riders and its  
13 recommendations regarding cost factors set forth in  
14 Duke's June 21, 2017, filing revised by supplemental  
15 testimony of Witness Ward.

16 Also on September 7, 2017, the Commission  
17 issued an Order Requiring Publication of Second Public  
18 Notice reflecting the higher fuel charges proposed by the  
19 Company and the supplemental testimony and revised  
20 exhibits of Kendra A. Ward.

21 On September 13, 2017, Duke and the Public  
22 Staff jointly filed a motion requesting that their  
23 witnesses be excused from attending the expert witness  
24 hearing on September 19, 2017.

1 All parties have agreed to waive cross  
2 examination of the witnesses. On September 15, 2017, the  
3 Commission ordered that all witnesses be excused from  
4 appearing at this hearing and that the testimony and  
5 exhibits of the witnesses be received into the record.

6 Pursuant to the State Ethics Act, I remind all  
7 members of the Commission of their duty to avoid  
8 conflicts of interest, and inquire whether any member of  
9 the Commission has a known conflict of interest with  
10 regard to the matters appearing before us this morning?

11 (No response.)

12 CHAIRMAN FINLEY: There appear to be no  
13 conflicts, so we will proceed with the proceeding and  
14 call on counsel to announce their appearances, beginning  
15 with the Applicant.

16 MR. KAYLOR: Thank you, Mr. Chairman, members  
17 of the Commission. Robert Kaylor appearing on behalf of  
18 Duke Energy Progress.

19 MR. ALLEN: Mr. Chairman, members of the  
20 Commission, my name is Dwight Allen. I'm also appearing  
21 on behalf of Duke Energy Progress.

22 MR. OLLS: Mr. Chairman, member of the  
23 Commission, Adam Olls appearing on behalf of Carolina  
24 Industrial Group for Fair Utility Rates. With me here is



1 Warren Hicks. She's an attorney with Bailey & Dixon. I  
2 think you're going to see a lot more of her at the  
3 Commission. Thank you.

4 MR. PAGE: Good morning. Bob Page representing  
5 Carolina Utility Customers Association.

6 MR. GILLAM: Good morning, Mr. Chairman and  
7 Commissioners. I am Bob Gillam with the Legal Division  
8 of the Public Staff representing the Using and Consuming  
9 Public.

10 MR. LEDFORD: Mr. Chairman, members of the  
11 Commission, Peter Ledford on behalf of North Carolina  
12 Sustainable Energy Association.

13 CHAIRMAN FINLEY: Any preliminary matters that  
14 we need to address before we move into the hearing  
15 itself?

16 MR. ALLEN: Mr. Chairman, I would say for the  
17 record, I guess it's a part of the hearing, we filed on  
18 September 13th the Affidavits of Publication for the  
19 initial public notice. As you said when you were giving  
20 your history of the case, the Commission issued an order  
21 on September 7 requiring a second public notice. We  
22 filed yesterday seven of the 11 Affidavits of Publication  
23 for the second public notice. We have verified with the  
24 newspapers that all the second notices were published by

1 the newspaper, but due to a sick child and one  
2 newspaper's unwillingness to email us the affidavits, the  
3 affidavits we understand are in the mail. We hope to get  
4 those today or tomorrow, and we will file them as soon as  
5 we get them.

6 CHAIRMAN FINLEY: All right. We look forward  
7 to getting those. Anything else?

8 MR. ALLEN: Mr. Chairman, as you said in your  
9 recitation of the history of the case, the parties have  
10 agreed to waive cross examination of all the witnesses in  
11 this case and to allow the testimony to go into the  
12 record. We'd like to thank Mr. Gillam with the Public  
13 Staff and Mr. Page and Mr. Olls and Mr. Ledford on behalf  
14 of their clients for agreeing to do the same thing. And  
15 at this point we would like to move into evidence the  
16 following items, first, the Application that was filed in  
17 this docket on June the 21st, 2017.

18 CHAIRMAN FINLEY: The Application of June 21st,  
19 2017 is admitted into evidence.

20 (Whereupon, Duke Energy Progress  
21 LLC's Application was admitted  
22 into evidence.)

23 MR. ALLEN: Kendra Ward filed direct testimony  
24 also on July -- on June 21st. That testimony consisted

1 of 15 pages and Exhibits 1 through 6. Some of the  
2 exhibits are multiple-page exhibits that have either  
3 multiple pages or schedules attached to those exhibits.  
4 She also filed workpapers consisting of Workpaper 1  
5 through Workpaper 13A. We would like that those exhibits  
6 be marked as they are marked for identification in the  
7 prefiled exhibits, and the workpapers also be marked as  
8 those workpapers are marked in their prefiled workpapers  
9 and entered into evidence.

10 CHAIRMAN FINLEY: All right. Ms. Ward's direct  
11 prefiled testimony filed June 21, 2017, consisting of 15  
12 pages, is copied into the record as though given orally  
13 from the stand.

14 (Whereupon, the prefiled direct  
15 testimony of Kendra A. Ward was  
16 copied into the record as if given  
17 orally from the stand.)  
18  
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22  
23  
24

## BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-2, SUB 1146

In the Matter of	)	
Application of Duke Energy Progress, LLC	)	<b>DIRECT TESTIMONY</b>
Pursuant to G.S. 62-133.2 and NCUC Rule	)	<b>OF KENDRA A. WARD FOR</b>
R8-55 Relating to Fuel and Fuel-Related	)	<b>DUKE ENERGY PROGRESS, LLC</b>
Charge Adjustments for Electric Utilities	)	

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Jun 21 2017

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

2     A.     My name is Kendra A. Ward. My business address is 550 South Tryon Street,  
3             Charlotte, North Carolina.

4     **Q.     BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

5     A.     I am a Rates Manager supporting both Duke Energy Carolinas, LLC ("DEC") and  
6             Duke Energy Progress, LLC ("DEP" or the "Company").

7     **Q.     PLEASE SUMMARIZE YOUR EDUCATION AND PROFESSIONAL**  
8             **QUALIFICATIONS.**

9     A.     I have a Bachelor of Arts degree in Political Science and Economics from the  
10            University of North Carolina at Chapel Hill and a Masters in Accounting from  
11            Appalachian State University. I am a certified public accountant licensed in the  
12            State of North Carolina. I began my career in 2004 with Cherry, Bekaert &  
13            Holland, LLP as a staff auditor. From 2006 until 2013 I held various financial  
14            accounting and reporting roles at Cherry, Bekaert and Holland, LLP; Wachovia  
15            Bank (now known as Wells Fargo) and The Shaw Group, Inc. (now known as  
16            CB&I). In 2013, I started at Duke Energy as Lead Accounting Analyst and held  
17            a variety of positions in the finance organization. I joined the Rates Department  
18            in 2016 as Manager, Rates and Regulatory Filings.

19    **Q.     HAVE YOU PREVIOUSLY TESTIFIED OR SUBMITTED TESTIMONY**  
20             **BEFORE THE NORTH CAROLINA UTILITIES COMMISSION?**

21    A.     No.

22    **Q.     ARE YOU FAMILIAR WITH THE ACCOUNTING PROCEDURES AND**  
23             **BOOKS OF ACCOUNT OF DEP?**

24    A.     Yes. Duke Energy Progress' books of account follow the uniform classification of

1 accounts prescribed by the Federal Energy Regulatory Commission ("FERC").

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

3 A. The purpose of my testimony is to present the information and data required by  
4 North Carolina General Statutes ("N.C. Gen. Stat.") § 62-133.2(c) and (d) and  
5 Commission Rule R8-55, as set forth in Ward Exhibits 1 through 6, along with  
6 supporting workpapers. The test period used in supplying this information and data  
7 is the period April 1, 2016 through March 31, 2017 ("test period"), and the billing  
8 period is December 1, 2017 through November 30, 2018 ("billing period").

9 **Q. WHAT IS THE SOURCE OF THE ACTUAL INFORMATION AND DATA**  
10 **FOR THE TEST PERIOD?**

11 A. Actual test period kilowatt hour ("kWh") generation, kWh sales, fuel-related  
12 revenues, and fuel-related expenses were taken from the Company's books and  
13 records. These books, records, and reports of the Company are subject to review by  
14 the regulatory agencies that regulate the Company's electric rates.

15 In addition, independent auditors perform an annual audit to provide  
16 assurance that, in all material respects, internal accounting controls are operating  
17 effectively and the Company's financial statements are accurate.

18 **Q. WERE WARD EXHIBITS 1 THROUGH 6 PREPARED BY YOU OR AT**  
19 **YOUR DIRECTION AND UNDER YOUR SUPERVISION?**

20 A. Yes, these exhibits were either prepared by me or at my direction and under my  
21 supervision, and consist of the following:

22 Exhibit 1: Summary Comparison of Fuel and Fuel-Related Costs Factors.

23 Exhibit 2:

24 Schedule 1: Fuel and Fuel-Related Costs Factors - reflecting a

1 92.6% proposed nuclear capacity factor and projected  
2 billing period megawatt hour ("MWh") sales.

3 Schedule 2: Fuel and Fuel-Related Costs Factors - reflecting a  
4 92.6% nuclear capacity factor and normalized test  
5 period sales.

6 Schedule 3: Fuel and Fuel-Related Costs Factors - reflecting an  
7 88.9% North American Electric Reliability  
8 Corporation ("NERC") five-year national weighted  
9 average nuclear capacity factor for pressurized water  
10 reactors and projected billing period MWh sales.

11 Exhibit 3:

12 Page 1: Calculation of the Proposed Composite Experience  
13 Modification Factor ("EMF") rate.

14 Page 2: Calculation of the EMF for residential customers.

15 Page 3: Calculation of the EMF for small general service  
16 customers.

17 Page 4: Calculation of the EMF for medium general service  
18 customers.

19 Page 5: Calculation of the EMF for large general service  
20 customers.

21 Page 6: Calculation of the EMF for lighting customers.

22 Exhibit 4: MWh Normalized Sales, Fuel Revenue, and Fuel and Fuel-Related  
23 Expense, as well as System Peak for the test period.

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1 Exhibit 5: Nuclear Capacity Ratings

2 Exhibit 6: March 2017 Monthly Fuel Reports.

3 1) March 2017 Monthly Fuel Report required by NCUC Rule  
4 R8-52.

5 2) March 2017 Monthly Base Load Power Plant Performance  
6 Report required by NCUC Rule R8-53.

7 **Q. PLEASE EXPLAIN WHAT IS SHOWN ON WARD EXHIBIT 1.**

8 A. Ward Exhibit 1 presents a summary of fuel and fuel-related cost factors, including  
9 the current fuel and fuel-related cost factors, the fuel and fuel-related cost factors  
10 using the NERC five-year average nuclear capacity factor using projected billing  
11 period sales, the fuel and fuel-related cost factors using the proposed capacity factor  
12 and normalized test period sales, and the proposed fuel and fuel-related cost factors.

13 **Q. WHAT FUEL AND FUEL RELATED COST FACTORS DOES DEP  
14 PROPOSE FOR INCLUSION IN RATES FOR THE BILLING PERIOD?**

15 A. The Company proposes that fuel and fuel-related costs factors shown in the table  
16 below be reflected in rates during the billing period. The factors that DEP proposes  
17 in this proceeding incorporate a 92.6% nuclear capacity factor as testified to by  
18 Company witness Gillespie, projected fossil fuel costs as testified to by Company  
19 witness Phipps, projected nuclear fuel costs as testified to by Company witness  
20 Church, and projected reagents costs as testified to by Company witness Miller. The  
21 components of the proposed fuel and fuel-related cost factors by customer class, as  
22 shown on Ward Exhibit 1 in cents per kWh ("cents/kWh"), are:



	Residential	Small General Service	Medium General Service	Large General Service	Lighting
	cents/KWh	cents/KWh	cents/KWh	cents/KWh	cents/KWh
Proposed Fuel and Fuel Related Costs cents/kWh	2.051	1.976	2.251	2.350	1.368
EMF Increment/(Decrement) cents/kWh	-	-	(0.081)	-	-
EMF Interest Decrement cents/kWh	-	-	(0.014)	-	-
Net Fuel and Fuel Related Costs Factors cents/kWh	2.051	1.976	2.156	2.350	1.368

2 **Q WHAT IS THE IMPACT TO CUSTOMERS' BILLS IF THE PROPOSED**  
3 **FUEL AND FUEL-RELATED COST FACTORS ARE APPROVED BY THE**  
4 **COMMISSION?**

5 A. If the proposed fuel and fuel-related cost factors are approved, there will be a 2.2%  
6 increase, on average, in customers' bills. The table below shows both the proposed  
7 and existing fuel and fuel-related cost factors (without regulatory fee).

	Residential	Small General Service	Medium General Service	Large General Service	Lighting
	cents/KWh	cents/KWh	cents/KWh	cents/KWh	cents/KWh
Proposed Factors cents/kWh	2.051	1.976	2.156	2.350	1.368
Current Factors cents/kWh	1.833	1.729	1.984	2.237	0.876

9 **Q. WHAT ARE THE KEY DRIVERS IMPACTING THE PROPOSED FUEL**  
10 **AND FUEL-RELATED COSTS FACTOR?**

11 A. The largest component of the increase is the incorporation of the return of \$10.6  
12 million of over-collected fuel costs and interest related to the test period EMF  
13 decrement, in contrast to the \$82 million of over-collected fuel costs and interest  
14 included in the existing EMF decrement. In addition, total fuel costs projected for  
15 the billing period are slightly decreasing. Although commodity prices are  
16 increasing, greater availability of nuclear and gas generation results in an overall  
17 decrease in system fuel costs.

1    **Q.    HOW DOES DEP DEVELOP THE FUEL FORECASTS FOR ITS**  
2    **GENERATING UNITS?**

3    A.    For this filing, DEP used an hourly dispatch model in order to generate its fuel  
4    forecasts. This hourly dispatch model considers the latest forecasted fuel prices,  
5    outages at the generating units based on planned maintenance and refueling  
6    schedules, forced outages at generating units based on historical trends, generating  
7    unit performance parameters, and expected market conditions associated with power  
8    purchases and off-system sales opportunities. In addition, the model dispatches  
9    DEP's and DEC's generation resources with the joint dispatch optimizing the  
10   generation fleets of DEP and DEC.

11   **Q.    PLEASE EXPLAIN WHAT IS SHOWN ON WARD EXHIBIT 2,**  
12   **SCHEDULES 1, 2, AND 3 INCLUDING THE NUCLEAR CAPACITY**  
13   **FACTORS.**

14   A.    Exhibit 2 is divided into three schedules. Schedule 1 sets forth the determination of  
15   the prospective fuel and fuel-related costs. The calculation uses the nuclear capacity  
16   factor of 92.6% as explained by Company witness Gillespie in his testimony, and  
17   provides the forecasted MWh sales for the billing period on which system  
18   generation and costs are based. Schedule 2 also uses the proposed capacity factor of  
19   92.6% along with normalized test period kWh generation, as prescribed by NCUC  
20   Rule R8-55(e)(3), which requires the use of the methodology adopted by the  
21   Commission in the Company's last general rate case.

22            The Capacity factor shown on Schedule 3 is prescribed in NCUC Rule R8-  
23   55(d)(1). The normalized five-year national weighted average NERC nuclear  
24   capacity factor is 88.9%. This capacity factor is based on the 2011 through 2015

1 data reported in the NERC's Generating Unit Statistical Brochure ("NERC  
2 Brochure") for pressurized water reactors rated at or above 800 MWs. A projected  
3 billing period kWh generation was also used for schedule 3 as required by NCUC  
4 Rule R8-55(d)(1).

5 Page 2 of Exhibit 2, Schedules 1, 2, and 3, presents the calculation of the  
6 proposed fuel and fuel-related costs factors by customer class resulting from the  
7 allocation of renewable and cogeneration power capacity costs by customer class on  
8 the basis of production plant as described in paragraph 26 of the Order in the  
9 Company's general rate case in Docket No. E-2, Sub 1023.

10 Page 3 of Exhibit 2, Schedules 1, 2, and 3 shows the allocation of system  
11 fuel costs to North Carolina retail jurisdiction, and the calculation of DEP's  
12 proposed fuel and fuel-related cost factors for the residential, small general service,  
13 medium general service, large general service, and lighting classes, exclusive of  
14 regulatory fee, using the uniform percentage average bill adjustment method.

15 **Q. PLEASE SUMMARIZE THE METHOD USED TO ADJUST TEST PERIOD**  
16 **KWH GENERATION IN WARD EXHIBIT 2 SCHEDULES 2 AND 3.**

17 **A.** The methodology used by DEP in its most recent general rate case for determining  
18 generation mix is based upon generation dispatch modeling used on Ward Exhibit 2,  
19 Schedule 1. For purposes of this filing, as a proxy for generation dispatch modeling,  
20 Ward Exhibit 2 Schedules 2 and 3 adjust the coal generation produced by the  
21 dispatch model. For example, on Exhibit 2, Schedule 2, which is based on the  
22 proposed capacity factor and normalized test period sales, DEP decreased the level  
23 of coal generation to account for the difference between forecasted generation and  
24 normalized test period generation.

1 On Exhibit 2, Schedule 3, which is based on the NERC capacity factor, DEP  
 2 increased the level of coal generation to account for the decrease in nuclear  
 3 generation. The decrease in nuclear generation results from assuming an 88.9%  
 4 NERC nuclear capacity factor compared to the proposed 92.6% nuclear capacity  
 5 factor.

6 **Q. WARD EXHIBIT 3 SHOWS THE CALCULATION OF THE TEST PERIOD**  
 7 **OVER/(UNDER) RECOVERY BALANCE AND THE EMF RATE. HOW**  
 8 **DID FUEL EXPENSES COMPARE WITH FUEL REVENUE DURING THE**  
 9 **TEST PERIOD?**

10 A. Ward Exhibit 3, Pages 1 through 6, demonstrates that for the test period, the  
 11 Company experienced a net under-recovery of \$33 million for the combined  
 12 customer classes. The table below shows the breakdown by customer class.

		Small	Medium	Large	
		General	General	General	
	Residential	Service	Service	Service	Lighting
	cents/KWh	cents/KWh	cents/KWh	cents/KWh	cents/KWh
EMF over/ (under) Collection of Fuel - (\$ million)	\$ (21.7)	\$ (1.1)	\$ 9.1	\$ (17.9)	\$ (1.8)
EMF Interest Costs (\$ million)	\$ -	\$ -	\$ 1.5	\$ -	\$ -

14 The over/(under) collection amount was determined each month by  
 15 comparing the amount of fuel revenue collected for each class to actual fuel and  
 16 fuel-related costs incurred by class. The revenue collected is based on actual  
 17 monthly sales for each class. Actual fuel and fuel-related costs incurred were first  
 18 allocated to NC retail jurisdiction based on jurisdictional sales, with consideration  
 19 given to any fuel and fuel-related costs or benefits that should be directly assigned.  
 20 The North Carolina retail amount is further allocated among customer classes as  
 21 follows: capacity-related purchased power costs were allocated among customer

1 classes based on production plant allocators from DEP's cost of service study. All  
2 other fuel and fuel-related costs were allocated among customer classes based on  
3 allocation factors determined using the uniform percentage average bill adjustment  
4 method used in the previous fuel proceeding.

5 **Q. WHAT IS DEP'S PROPOSAL WITH RESPECT TO THE OVER/(UNDER)**  
6 **RECOVERY BALANCE?**

7 A. DEP proposes to defer collection of the \$42.5 million under- recovered amounts for  
8 the residential, small general service, large general service and lighting classes until  
9 its 2018 annual fuel proceeding, in order to mitigate customer rate impacts.  
10 Deferring the recovery of the under-collection balance to next year reduces the  
11 current year proposed residential percentage increase from 3.4% to 2.1% and  
12 reduces the typical residential customer's monthly bill increase from \$3.52 to \$2.18.  
13 DEP will return the over-recovered amount of \$9.1 million plus interest to the  
14 medium general service class during the rate period December 1, 2017 through  
15 November 30, 2018.

16 **Q. PLEASE EXPLAIN WHAT IS SHOWN ON WARD EXHIBIT 4.**

17 A. As required by NCUC Rule R8-55(e)(1) and (e)(2), Ward Exhibit 4 sets forth test  
18 period actual MWh sales, the customer growth MWh adjustment, and the weather  
19 MWh adjustment. Test period MWh sales were normalized for weather using a 30-  
20 year period, as used in DEP's last general rate case (Docket No. E-2, Sub 1023) and  
21 fuel and fuel-related cost recovery proceeding (Docket No. E-2, Sub 1107).  
22 Customer growth was determined using regression analysis for residential, small  
23 general service, and lighting classes, and a customer-by-customer analysis for  
24 medium and large general service customers. Ward Exhibit 4 also sets forth actual

1 test period fuel-related revenue and fuel expense on a total Company basis and for  
2 North Carolina Retail. Finally, Ward Exhibit 4 shows the test period peak demand  
3 for the system and for North Carolina Retail customer classes.

4 **Q. PLEASE IDENTIFY WHAT IS SHOWN ON WARD EXHIBIT 5.**

5 A. Ward Exhibit 5 sets forth the capacity ratings for each of DEP's nuclear units, in  
6 compliance with Rule R8-55(e)(12).

7 **Q. DO YOU BELIEVE DEP'S FUEL AND FUEL-RELATED COSTS**  
8 **INCURRED IN THE TEST YEAR ARE REASONABLE?**

9 A. Yes. As shown on Ward Exhibit 6, DEP's test year actual fuel and fuel-related costs  
10 were 2.441 cents/kWh. Key factors in DEP's ability to maintain lower fuel and fuel-  
11 related rates include its diverse generating portfolio mix of nuclear, coal, natural gas,  
12 and hydro; lower natural gas and coal prices; the capacity factors of its nuclear fleet;  
13 and fuel procurement strategies that mitigate volatility in supply costs. Other key  
14 factors include the combination of DEP's and DEC's respective skills in procuring,  
15 transporting, managing and blending fuels, procuring reagents, and the increased and  
16 broader purchasing ability of the combined Company, as well as the joint dispatch of  
17 DEP's and DEC's generation resources. Company witness Gillespie discusses the  
18 performance of DEP's nuclear generation fleet, and Company witness Miller  
19 discusses the performance of the fossil/hydro/solar fleet, as well as the chemicals  
20 that DEP uses to reduce emissions. Company witness Phipps discusses fossil fuel  
21 procurement strategies and merger fuel-related savings, and Company witness  
22 Church discusses DEP's nuclear fuel costs and procurement strategies.

23 **Q. IN DEVELOPING THE PROPOSED FUEL AND FUEL-RELATED COST**  
24 **FACTORS, WERE THE FUEL COSTS ALLOCATED IN ACCORDANCE**

1       **WITH N.C. GEN. STAT. § 62-133.2(A2)?**

2       A.     Yes, the costs for which statutory guidance is provided are allocated in compliance  
3             with N.C. Gen. Stat. § 62-133.2(a2). These costs are described in subdivisions (4),  
4             (5), and (6) of N.C. Gen. Stat. § 62-133.2(a1). Subdivision (4) includes purchased  
5             power non-capacity costs subject to economic curtailment or dispatch. Subdivision  
6             (5) includes cogeneration and independent power producer capacity costs.  
7             Subdivision (6) includes renewable capacity costs. The allocation methods for  
8             subdivisions (4), (5), and (6) are found in paragraph 26 of DEP's last general rate  
9             case Order in Docket No. E-2, Sub 1023. Capacity-related purchased power costs in  
10            Subdivision (5) and (6) are allocated based upon the production plant allocator from  
11            the latest annual cost of service study, using the cost of service methodology  
12            approved in DEP's most recent rate case, Docket No. E-2, Sub 1023. Subdivision  
13            (4) costs and non-capacity costs in Subdivision (6) are allocated in the same manner  
14            as all other fuel and fuel-related costs, using a uniform percentage average bill  
15            adjustment method.

16       **Q.     HOW ARE THE OTHER FUEL COSTS ALLOCATED FOR WHICH**  
17             **THERE IS NO SPECIFIC GUIDANCE IN N.C. GEN. STAT. § 62-133.2(A2)?**

18       A.     System costs are allocated to NC retail jurisdiction based on jurisdictional sales, with  
19             consideration given to any fuel and fuel-related costs or benefits that should be  
20             directly assigned. Costs are further allocated among customer classes using the  
21             uniform percentage average bill adjustment methodology in setting fuel rates in this  
22             fuel proceeding. DEP proposes to use the same uniform percentage average bill  
23             adjustment methodology to adjust its fuel rates to reflect a proposed increase in fuel  
24             and fuel-related costs as it did in its 2016 fuel and fuel-related cost recovery

1 proceeding in Docket No. E-2, Sub 1107.

2 **Q. PLEASE EXPLAIN THE CALCULATION OF THE UNIFORM**  
3 **PERCENTAGE AVERAGE BILL ADJUSTMENT METHOD SHOWN ON**  
4 **WARD EXHIBIT 2, PAGE 3 OF SCHEDULES 1, 2, AND 3.**

5 **A.** Ward Exhibit 2, Page 3 of Schedule 1 shows DEP's proposed fuel and fuel-related  
6 cost factors for the residential, small general service, medium general service, large  
7 general service, and lighting classes, exclusive of regulatory fee. The uniform bill  
8 percentage change of 2.2% was calculated by dividing the fuel and fuel-related cost  
9 increase of \$69 million for North Carolina retail by the normalized annual North  
10 Carolina retail revenues at current rates of \$3.2 billion. The cost increase of \$69  
11 million was determined by comparing the total proposed fuel rate per kWh to the  
12 total fuel rate per kWh currently being collected from customers, and multiplying  
13 the resulting increase in fuel rate per kWh by projected North Carolina retail kWh  
14 sales for the billing period. The proposed fuel rate per kWh equals the sum of: (1)  
15 the rate necessary to recover projected period fuel costs; (2) the proposed composite  
16 EMF increment/(decrement) rate and (3) the proposed EMF decrement interest rate  
17 (as computed on Ward Exhibit 3, page 1). Ward Exhibit 2, Page 3 of Schedules 2  
18 and 3 uses the same calculation, but with the methodology as prescribed by NCUC  
19 Rule R8-55(e)(3) and NCUC Rule R8-55(d)(1), respectively.

20 **Q. HOW ARE SPECIFIC FUEL AND FUEL-RELATED COST FACTORS FOR**  
21 **EACH CUSTOMER CLASS DERIVED FROM THE UNIFORM PERCENT**  
22 **ADJUSTMENT COMPUTED ON WARD EXHIBIT 2, PAGE 3 OF**  
23 **SCHEDULES 1, 2, AND 3?**

24 **A.** In each of Ward Exhibit 2, Page 3 of Schedules 1, 2, and 3, the equal percent



1 increase for each customer class is applied to current annual revenues by customer  
2 class to determine a dollar amount of increase for each customer class. The dollar  
3 increase is divided by the projected billing period sales for each class to derive a  
4 cents/kWh increase. The current total fuel and fuel-related cost factors for each class  
5 are adjusted by the proposed cents/kWh increase or decrease to get the proposed  
6 total fuel and fuel-related cost factors. The proposed total fuel factors are then  
7 separated into the prospective and EMF components by subtracting the EMF  
8 components for each customer class (EMF components computed on Ward Exhibit  
9 3, Page 2, 3, 4, 5, and 6) to derive the prospective rate component for each customer  
10 class. This breakdown of projected fuel and fuel-related cost factor and EMF  
11 increment/ (decrement) is shown on Ward Exhibit 2, Page 2 of Schedules 1, 2, and  
12 3.

13 **Q. DO THE PROPOSED RATES INCLUDE THE NET GAIN OR LOSS ON**  
14 **THE SALE OF BY-PRODUCTS FOR BENEFICIAL REUSE FROM THE**  
15 **SUTTON COAL PLANT?**

16 A. No. Net gains or losses related to the sale of by-products for beneficial reuse from  
17 the Sutton coal plant are being handled in accordance with witness McGee's  
18 testimony in the DEP rate case, Docket E-2, Sub 1142, and are not included in the  
19 proposed fuel rates.

20 **Q. CAN YOU IDENTIFY WHERE IN THIS FILING THE MERGER FUEL**  
21 **RELATED SAVINGS ARE INCLUDED?**

22 A. Merger fuel-related savings automatically flow to DEP's retail customers through  
23 the fuel and fuel-related cost component of customers' rates. Actual merger savings  
24 during the test period are included in the EMF portion of the proposed fuel and fuel-

1 related cost factors. In addition, in the prospective component of the factors, the  
2 projected merger savings related to procuring coal and reagents, lower transportation  
3 costs, lower gas capacity costs, and coal blending are reflected in the cost of fossil  
4 fuel. Projected joint dispatch savings, which are the result of using the combined  
5 systems' lowest available generation to meet total customer demand, are also  
6 reflected in the cost of fossil fuel as well as the projected purchases and sales that  
7 include the purchases and sales between DEP and DEC. Actual and projected  
8 savings related to the procurement of nuclear fuel are reflected in the cost of nuclear  
9 fuel.

10 **Q. HAS THE COMPANY FILED WORKPAPERS SUPPORTING THE**  
11 **CALCULATIONS, ADJUSTMENTS, AND NORMALIZATIONS AS**  
12 **REQUIRED BY NCUC RULE R8-55(E)(11)?**

13 A. Yes. The work papers supporting the calculations, adjustments, and normalizations  
14 are included with the filing in this proceeding.

15 **Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?**

16 A. Yes, it does.

1           CHAIRMAN FINLEY: Her Exhibits 1 through 6 are  
2 marked for identification as marked in the filing and  
3 admitted into evidence, and the Workpapers 1 through 13A  
4 are accepted into evidence.

5                       (Whereupon, Ward Exhibits 1-6 and  
6 Ward Workpapers 1-13 were identified  
7 as premarked and admitted into  
8 evidence.)

9           MR. ALLEN: Next, witness Brett Phillips (sic)  
10 filed direct testimony consisting of eight pages with  
11 Exhibits 1 through 3. We would point out for the  
12 Commission that Exhibit 3 to Mr. Phipps' testimony was  
13 filed under seal subject to the confidentiality rules,  
14 and we would like to maintain the confidentiality of that  
15 Exhibit 3. We would ask that Mr. Phipps' eight pages of  
16 testimony be copied into the record as if given orally,  
17 and that the exhibits be marked as they are premarked in  
18 his prefiled testimony and they be entered into evidence.

19           CHAIRMAN FINLEY: Mr. Phipps' direct prefiled  
20 testimony, filed June 21, 2017, is copied into the record  
21 as though given orally from the stand, consists of eight  
22 pages.

23

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1 (Whereupon, the prefiled direct  
2 testimony of Brett Phipps was copied  
3 into the record as if given orally  
4 from the stand.)  
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BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-2, SUB 1146

In the Matter of	)	
Application of Duke Energy Progress, LLC	)	<b>DIRECT TESTIMONY OF</b>
Pursuant to G.S. 62-133.2 and NCUC Rule	)	<b>BRETT PHIPPS FOR</b>
R8-55 Relating to Fuel and Fuel-Related	)	<b>DUKE ENERGY PROGRESS, LLC</b>
Charge Adjustments for Electric Utilities	)	

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JUN 21 2017

1 Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

2 A. My name is Brett Phipps. My business address is 526 South Church Street,  
3 Charlotte, North Carolina 28202.

4 Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

5 A. I am employed as Managing Director, Fuel Procurement, for Duke Energy  
6 Corporation ("Duke Energy"). In that capacity, I directly manage the organization  
7 responsible for the purchase and delivery of coal, natural gas, and fuel oil to Duke  
8 Energy's regulated generation fleet, including Duke Energy Progress, LLC ("Duke  
9 Energy Progress," "DEP," or the "Company") and Duke Energy Carolinas, LLC  
10 ("DEC") (collectively, the "Utilities," or the "Companies"). In addition to fuels, I  
11 also supervise the procurement of all reagents and emissions.

12 Q. PLEASE BRIEFLY SUMMARIZE YOUR EDUCATIONAL AND  
13 PROFESSIONAL EXPERIENCE.

14 A. I have a Bachelor of Science degree in Chemistry from Marshall University. I began  
15 my career in the mining industry in 1993 where I held various roles associated with  
16 surface mining operations. I joined Progress Energy in 1999, holding roles in  
17 terminal operations and sales and marketing for the unregulated business. I  
18 transitioned to the regulated utility in 2005 where I worked in various fuels  
19 procurement functions and management roles. I joined Duke Energy in July 2012  
20 and am currently Managing Director, Fuels Procurement. I am a member of the  
21 American Coal Council, The Coal Institute, the Lexington Coal Exchange, Southern  
22 Gas Association, and the American Gas Association.

1     **Q.     HAVE YOU SUBMITTED TESTIMONY BEFORE THIS COMMISSION IN**  
2     **ANY PRIOR PROCEEDINGS?**

3     A.     Yes. In May of 2017, I adopted the testimony filed by Swati V. Daji in support of  
4     DEC's 2016 fuel and fuel-related cost recovery application in Docket No. E-7, Sub  
5     1129.

6     **Q.     WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**  
7     **PROCEEDING?**

8     A.     The purpose of my testimony is to describe DEP's fossil fuel purchasing practices,  
9     provide fossil fuel costs for the period April 1, 2016 through March 31, 2017 ("test  
10    period") versus April 1, 2015 through March 31, 2016 ("prior test period"), and  
11    describe changes forthcoming for the period December 1, 2017 through November  
12    30, 2018 ("billing period"). I also provide an update on the status of guaranteed  
13    merger fuel-related savings that – pursuant to the merger agreement between Duke  
14    Energy and Progress Energy, Inc. ("Merger") – Duke Energy is delivering to its  
15    North Carolina and South Carolina customers.

16    **Q.     YOUR TESTIMONY INCLUDES THREE EXHIBITS. WERE THESE**  
17    **EXHIBITS PREPARED BY YOU OR AT YOUR DIRECTION AND UNDER**  
18    **YOUR SUPERVISION?**

19    A.     Yes. These exhibits were prepared at my direction and under my supervision, and  
20    consist of Phipps Exhibit 1 which summarizes the Company's Fossil Fuel  
21    Procurement Practices, Phipps Exhibit 2 which summarizes total monthly natural  
22    gas purchases and monthly contract and spot coal purchases for the test period and  
23    the prior test period, and Phipps Exhibit 3 which summarizes the fuels related

1 transactional activity between DEC and Piedmont Natural Gas Company, Inc.  
2 ("Piedmont") for spot commodity transactions during the test period, as required by  
3 the Merger Agreement between Duke Energy and Piedmont, of which DEP receives  
4 an allocated portion based on its pro rata share of the overall gas plant burns for the  
5 respective month.

6 **Q. HOW DOES DEP OPERATE ITS PORTFOLIO OF GENERATION ASSETS**  
7 **TO RELIABLY AND ECONOMICALLY SERVE ITS CUSTOMERS?**

8 A. Both DEP and DEC utilize the same process to ensure that the assets of the  
9 Companies are reliably and economically available to serve their respective  
10 customers. To that end, both companies consider numerous factors such as the latest  
11 forecasted fuel prices, transportation rates, planned maintenance and refueling  
12 outages at the generating units, estimated forced outages at generating units based on  
13 historical trends, generating unit performance parameters, and expected market  
14 conditions associated with power purchases and off-system sales opportunities in  
15 order to determine the most economic and reliable means of serving their  
16 customers.

17 **Q. PLEASE DESCRIBE THE COMPANY'S DELIVERED COST OF COAL**  
18 **AND NATURAL GAS DURING THE TEST PERIOD.**

19 A. The Company's average delivered cost of coal per ton for the test period was \$80.26  
20 per ton, compared to \$80.74 per ton in the prior test period, representing a decrease  
21 of approximately 1%. This includes an average transportation cost of \$28.03 per ton  
22 in the test period, compared to \$24.02 per ton in the prior test period, representing an  
23 increase of 17%. The Company's average price of gas purchased for the test period



1 was \$4.00 per Million British Thermal Units ("MMBtu"), compared to \$4.10 per  
2 MMBtu in the prior test period, representing a decrease of 2%. The cost of gas  
3 includes gas supply, transportation, storage and financial hedging.

4 DEP's coal burn for the test period was 4.7 million tons, compared to a coal  
5 burn of 4.8 million tons in the prior test period, representing a decrease of 3%. The  
6 Company's natural gas burn for the test period was 170.0 MMBtu, compared to a  
7 gas burn of 176.0 MMBtu in the prior test period, representing a decrease of 4%.

8 The differences result primarily from changes in weather driven demand and  
9 commodity prices coupled with strong performance by the Company's nuclear fleet.

10 **Q. PLEASE DESCRIBE THE LATEST TRENDS IN COAL AND NATURAL**  
11 **GAS MARKET CONDITIONS.**

12 A. Coal markets continue to be in a state of flux due to a number of factors, including:  
13 (1) uncertainty around proposed, imposed and stayed U.S. Environmental Protection  
14 Agency ("EPA") regulations for power plants; (2) continued abundant natural gas  
15 supply and storage resulting in lower natural gas prices combined with installation of  
16 new combined cycle ("CC") generation by utilities, especially in the Southeast,  
17 which has also lowered overall coal demand; (3) continued changes in demand for  
18 global markets for both steam and metallurgical coal; (4) uncertainty surrounding  
19 regulations for mining operations; and (5) the on-going financial viability of many of  
20 the Company's coal suppliers.

21 With respect to natural gas, the nation's natural gas supply has grown  
22 significantly over the last several years and producers continue to enhance  
23 production techniques, increase efficiencies, and lower production costs. In the

1 shorter term, natural gas prices are reflective of the dynamics between supply and  
2 demand factors, such as seasonal weather and overall storage inventory balances.  
3 Over the longer term planning horizon, natural gas supply is projected to continue to  
4 increase along with the needed pipeline infrastructure to move the growing supply to  
5 meet demand related to power generation, liquefied natural gas exports and pipeline  
6 exports to Mexico.

7 **Q. WHAT ARE THE PROJECTED COAL AND NATURAL GAS**  
8 **CONSUMPTIONS AND COSTS FOR THE BILLING PERIOD?**

9 A. DEP's current coal burn projection for the billing period is 3.7 million tons  
10 compared to 4.7 million tons consumed during the test period. DEP's billing period  
11 projections for coal generation may be impacted due to changes from factors such as  
12 delivered natural gas prices versus the average delivered cost of coal, volatile power  
13 prices, and electric demand. Combining coal and transportation costs, DEP projects  
14 average delivered coal costs of approximately \$78.96 per ton for the billing period  
15 compared to \$80.26 per ton in the test period. This cost, however, is subject to  
16 change based on factors such as: (1) exposure to market prices and their impact on  
17 open coal positions; (2) the amount of non-Central Appalachian coal DEP is able to  
18 consume; (3) performance of contract deliveries by suppliers and railroads, which  
19 may not occur despite DEP's strong contract compliance monitoring process; (4)  
20 changes in transportation rates; and (5) potential additional costs associated with  
21 suppliers' compliance with legal and statutory changes, the efforts of which can be  
22 passed on through coal contracts.

1 DEP's current natural gas burn projection for the billing period is  
2 approximately 147.0 MMBtu, which is a decrease from the 170.0 MMBtu consumed  
3 during the test period. The current average forward Henry Hub price for the billing  
4 period is \$3.01 per MMBtu, compared to \$2.77 per MMBtu in the test period.  
5 Projected burn volumes will vary based on factors such as changes in commodity  
6 prices and weather driven demand.

7 **Q. WHAT STEPS IS DEP TAKING TO MANAGE PORTFOLIO FUEL**  
8 **COSTS?**

9 A. The Company continues to maintain a comprehensive coal and natural gas  
10 procurement strategy that has proven successful over the years in limiting average  
11 annual fuel price changes while actively managing the dynamic demands of its fossil  
12 fuel generation fleet in a reliable and cost effective manner. Aspects of this  
13 procurement strategy include having an appropriate mix of contract and spot  
14 purchases for coal, staggering coal contract expirations which thereby limit exposure  
15 to market price changes, diversifying coal sourcing as economics warrant, as well as  
16 working with coal suppliers to incorporate additional flexibility into their supply  
17 contracts. The Company expects to address any spot and long-term coal  
18 requirements throughout this year with any potential competitively bid purchases, if  
19 made, taking into account projected coal burns, as well as coal inventory levels.

20 The Company has implemented natural gas procurement practices that  
21 include periodic Requests for Proposals and short-term market engagement activities  
22 to procure and actively manage a reliable, flexible, diverse, and competitively priced  
23 natural gas supply that includes contracting for volumetric optionality in order to

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1 provide flexibility in responding to changes in forecasted fuel consumption. Lastly,  
2 DEP continues to maintain a short-term natural gas hedging plan to manage fuel cost  
3 risk for customers through a disciplined, structured execution approach. DEP  
4 continues to monitor and make adjustments as necessary to its natural gas hedging  
5 program.

6 **Q. PLEASE PROVIDE AN UPDATE ON THE STATUS OF THE**  
7 **GUARANTEED MERGER FUEL-RELATED SAVINGS THE COMPANY**  
8 **HAS ACHIEVED THUS FAR FOR ITS RETAIL CUSTOMERS.**

9 A. During September 2016, the Utilities met the guaranteed merger savings target of  
10 \$721.8 million established pursuant to both the merger agreement between Duke  
11 Energy and Progress Energy, Inc., and the merger agreement between Duke Energy  
12 and Piedmont Natural Gas Company, Inc. The combined merger savings through  
13 September totaled \$723 million, of which DEP's North Carolina share was \$183  
14 million.

15 **Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?**

16 A. Yes, it does.

1                   CHAIRMAN FINLEY: And Exhibits 1 through 3 are  
2 marked for identification as premarked in the filing and  
3 admitted into evidence, with Exhibit 3 indicating that it  
4 has confidential information in it.

5                               (Whereupon, Phipps Exhibits 1-3 were  
6 identified as premarked and admitted  
7 into evidence. Phipps Exhibit 3 was  
8 filed under seal.)

9                   MR. ALLEN: Our next witness, Mr. Chair and  
10 members of the Commission, is Joseph Miller. Mr. Miller  
11 filed direct testimony in this docket consisting of 11  
12 pages, and we would ask that his testimony be copied into  
13 the record.

14                   CHAIRMAN FINLEY: Mr. Miller's direct prefiled  
15 testimony filed June 21, 2017, consisting of 11 pages, is  
16 copied into the record as though given orally from the  
17 stand.

18                               (The prefiled direct testimony of  
19 Joseph A. Miller, Jr. was copied  
20 into the record as if given orally  
21 from the stand.)

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## BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-2, SUB 1146

In the Matter of )  
Application of Duke Energy Progress, LLC )  
Pursuant to G.S. 62-133.2 and NCUC Rule )  
R8-55 Relating to Fuel and Fuel-Related )  
Charge Adjustments for Electric Utilities )

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**DIRECT TESTIMONY OF**  
**JOSEPH A. MILLER JR. FOR**  
**DUKE ENERGY PROGRESS, LLC**

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Jun 21 2017

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

2   A.   My name is Joseph A. Miller, Jr. and my business address is 526 South Church  
3       Street, Charlotte, North Carolina 28202.

4   **Q.   BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

5   A.   I am Vice President of Central Services for Duke Energy Business Services, LLC  
6       ("DEBS"). DEBS is a service company subsidiary of Duke Energy Corporation  
7       ("Duke Energy") that provides services to Duke Energy and its subsidiaries,  
8       including Duke Energy Progress, LLC ("DEP" or the "Company") and Duke Energy  
9       Carolinas, LLC ("DEC").

10  **Q.   PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL AND**  
11  **PROFESSIONAL BACKGROUND.**

12  A.   I graduated from Purdue University with a Bachelor of Science degree in  
13       mechanical engineering. I also completed twelve post graduate level courses in  
14       Business Administration at Indiana State University. My career began with Duke  
15       Energy (d/b/a Public Service of Indiana) in 1991 as a staff engineer at Duke Energy  
16       Indiana's Cayuga Steam Station. Since that time, I have held various roles of  
17       increasing responsibility in the generation engineering, maintenance, and operations  
18       areas, including the role of station manager, first at Duke Energy Kentucky's East  
19       Bend Steam Station, followed by Duke Energy Ohio's Zimmer Steam Station. I was  
20       named General Manager of Analytical and Investments Engineering in 2010, and  
21       became General Manager of Strategic Engineering in 2012 following the merger  
22       between Duke Energy and Progress Energy, Inc. I became the Vice President of  
23       Central Services in 2014.

1   **Q.   WHAT ARE YOUR DUTIES AS VICE PRESIDENT OF CENTRAL**  
2   **SERVICES?**

3   A.   In this role, I am responsible for providing engineering, environmental compliance  
4       planning, generation and regulatory strategy, technical services, and maintenance  
5       services, for Duke Energy's fleet of fossil, hydroelectric, and solar (collectively,  
6       "Fossil/Hydro/Solar") facilities.

7   **Q.   HAVE YOU TESTIFIED OR SUBMITTED TESTIMONY BEFORE THIS**  
8   **COMMISSION IN ANY PRIOR PROCEEDINGS?**

9   A.   Yes. I have filed testimony before the North Carolina Utilities Commission  
10       ("Commission" or "NCUC") in DEP's 2015 and 2016 annual fuel and fuel-related  
11       cost recovery proceedings (Docket No. E-2, Subs 1069 and 1107), as well as DEC's  
12       2016 and 2017 annual fuel and fuel-related cost recovery proceedings (Docket No.  
13       E-7, Subs 1104 and 1129).

14   **Q.   WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**  
15   **PROCEEDING?**

16   A.   The purpose of my testimony is to (1) describe DEP's fossil/hydro/solar generation  
17       portfolio and changes made since the 2016 fuel cost recovery proceeding, as well as  
18       those expected in the near term, (2) discuss the performance of DEP's  
19       fossil/hydro/solar facilities during the period of April 1, 2016 through March 31,  
20       2017 (the "test period"), (3) provide information on significant fossil/hydro/solar  
21       outages that occurred during the test period, and (4) provide information concerning  
22       environmental compliance efforts.



1 Q. PLEASE DESCRIBE DEP'S FOSSIL/HYDRO/SOLAR GENERATION  
2 PORTFOLIO.

3 A. The Company's fossil/hydro/solar generation portfolio consists of 9,288 megawatts  
4 ("MWs") of generating capacity, made up as follows:

5	Coal-fired -	3,544 MWs
6	Combustion Turbines -	2,887 MWs
7	Combined Cycle -	2,568 MWs
8	Hydro -	227 MWs
9	Solar <sup>1</sup> -	62 MWs

10 The 3,544 MWs of coal-fired generation resources represent three generating  
11 stations and a total of seven units. These units are equipped with emission control  
12 equipment, including selective catalytic reduction ("SCR") equipment for removing  
13 nitrogen oxides ("NOx"), flue gas desulfurization ("FGD" or "scrubber") equipment  
14 for removing sulfur dioxide ("SO2"), and low NOx burners. This inventory of coal-  
15 fired assets with emission control equipment enhances DEP's ability to maintain  
16 current environmental compliance and concurrently utilize coal with increased sulfur  
17 content, thereby providing flexibility for DEP to procure the most cost-effective  
18 options for fuel supply.

19 The Company has a total of 34 simple cycle combustion turbine ("CT")  
20 units, the larger 14 of which provide 2,183 MWs. These 14 units are located at the

<sup>1</sup> This value represents the relative dependable capacity contribution to meeting summer peak demand, based on the Company's integrated resource planning metrics. The nameplate capacity of the Company's solar facilities is 141 MWs.

1 Asheville (NC), Darlington (SC), Smith Energy (NC), and Wayne County (NC)  
2 facilities, and are equipped with water injection and/or low NOx burners for NOx  
3 control. The 2,568 MWs shown above as "Combined Cycle" ("CC") represent four  
4 power blocks. The HF Lee Energy Complex CC power block ("HF Lee CC") has a  
5 configuration of three CTs and one steam turbine. The two power blocks located at  
6 the Smith Energy Complex ("Richmond CC") consist of two CTs and one steam  
7 turbine each. The Sutton Combined Cycle at Sutton Energy Complex ("Sutton CC")  
8 consists of two CTs and one steam turbine. The four CC power blocks, are equipped  
9 with SCR equipment, and all nine CTs have low NOx burners.

10 The Company's hydro fleet consists of 15 units providing 227 MWs of  
11 capacity and its solar fleet consists of four sites with 141 MWs of nameplate  
12 capacity which provide 62 MWs of relative dependable capacity.

13 **Q. WHAT CHANGES HAVE OCCURRED WITHIN THE**  
14 **FOSSIL/HYDRO/SOLAR PORTFOLIO SINCE DEP'S 2016 ANNUAL FUEL**  
15 **AND FUEL-RELATED COST RECOVERY PROCEEDING?**

16 **A.** The Company added the Elm City solar site with 40 MWs of nameplate capacity,  
17 providing 18 MWs of utility equivalent capacity, which brings the Company's total  
18 solar dependable capacity to 62 MWs. Sutton CT Unit 1 retired in March 2017,  
19 which reduced capacity by 11 MWs. Sutton CT Unit 2 and Unit 3 will retire in mid  
20 2017, when the new Sutton fast start CTs come online, which will provide 84 MWs  
21 of capacity.

1 Q. WHAT ARE DEP'S OBJECTIVES IN THE OPERATION OF ITS  
2 FOSSIL/HYDRO/SOLAR FACILITIES?

3 A. The primary objective of DEP's fossil/hydro/solar generation department is to  
4 provide safe, reliable and cost-effective electricity to DEP's Carolinas customers.  
5 Operations personnel and other station employees are well-trained and execute their  
6 responsibilities to the highest standards in accordance with procedures, guidelines,  
7 and a standard operating model. Like safety, environmental compliance is a "first  
8 principle" and DEP works very hard to achieve high level results.

9 The Company complies with all applicable environmental regulations and  
10 maintains station equipment and systems in a cost-effective manner to ensure  
11 reliability. The Company also takes action in a timely manner to implement work  
12 plans and projects that enhance the safety and performance of systems, equipment,  
13 and personnel, consistent with providing low-cost power options for DEP's  
14 customers. Equipment inspection and maintenance outages are generally scheduled  
15 during the spring and fall months when customer demand is reduced due to milder  
16 temperatures. These outages are well-planned and executed with the primary  
17 purpose of preparing the unit for reliable operation until the next planned outage.

18 Q. HOW MUCH GENERATION DID EACH TYPE OF GENERATING  
19 FACILITY PROVIDE FOR THE TEST PERIOD?

20 A. For the test period, DEP's total system generation was 62,749,766 MW hours  
21 ("MWHs"), of which 33,716,463 MWHs, or approximately 54%, was provided by  
22 the fossil/hydro/solar fleet. The breakdown includes 35% contribution from gas

1 facilities, 18% contribution from coal-fired stations, approximately 1% contribution  
2 from hydro and solar facilities.

3 The Company's portfolio includes a diverse mix of units that, along with  
4 additional nuclear capacity, allow DEP to meet the dynamics of customer load  
5 requirements in a logical and cost-effective manner. Additionally, DEP has utilized  
6 the Joint Dispatch Agreement ("JDA"), which allows generating resources for DEP  
7 and DEC to be dispatched as a single system to enhance dispatching at the lowest  
8 possible cost. The cost and operational characteristics of each unit generally  
9 determine the type of customer load situation (e.g., base and peak load requirements)  
10 that a unit would be called upon or dispatched to support.

11 **Q. HOW DID DEP COST EFFECTIVELY DISPATCH THE DIVERSE MIX OF**  
12 **GENERATING UNITS DURING THE TEST PERIOD?**

13 A. The Company, like other utilities across the U.S., has experienced a change in the  
14 dispatch order for each type of generating facility due to continued favorable  
15 economics resulting from the low pricing of natural gas. Further, the addition of  
16 new CC units within DEP's portfolio in recent years has provided DEP with  
17 additional natural gas resources that feature state-of-the-art technology for increased  
18 efficiency, and significantly reduced emissions. These factors promote the use of  
19 natural gas and provide real benefits in cost of fuel and reduced emissions for  
20 customers. Gas fired facilities provided 65% of the DEP Fossil/Hydro/Solar  
21 generation during the review period.

1 Q. PLEASE EXPLAIN THE TERM "HEAT RATE" AND WHAT WAS THE  
2 HEAT RATE FOR DEP'S COAL-FIRED FLEET AND COMBINED  
3 CYCLES DURING THE TEST PERIOD?

4 A. Heat rate is a measure of the amount of thermal energy needed to generate a given  
5 amount of electric energy and is expressed as British thermal units ("Btu") per  
6 kilowatt-hour ("kWh"). A low heat rate indicates an efficient fleet that uses less heat  
7 energy from fuel to generate electrical energy. Over the test period, the seven coal  
8 units produced 33% of the fossil/hydro/solar generation. The average heat rate for  
9 the coal-fired units was 10,550 Btu/kWh. The most active station during this period  
10 was Roxboro, providing 70% of the coal production with a heat rate of 10,177  
11 Btu/kWh.

12 During the test period, the four CC power blocks produced 55% of the  
13 fossil/hydro/solar generation with an average heat rate of 7,094 Btu/kWh.

14 Q. PLEASE DISCUSS THE OPERATIONAL RESULTS FOR DEP'S  
15 FOSSIL/HYDRO/SOLAR FLEET DURING THE TEST PERIOD.

16 A. The Company's generating units operated efficiently and reliably during the test  
17 period. Several key measures are used to evaluate the operational performance  
18 depending on the generator type: (1) equivalent availability factor ("EAF"), which  
19 refers to the percent of a given time period a facility was available to operate at full  
20 power, if needed (EAF is not affected by the manner in which the unit is dispatched  
21 or by the system demands; it is impacted, however, by planned and unplanned (*i.e.*,  
22 forced) outage time); (2) net capacity factor ("NCF"), which measures the  
23 generation that a facility actually produces against the amount of generation that

1 theoretically could be produced in a given time period, based upon its maximum  
 2 dependable capacity (NCF is affected by the dispatch of the unit to serve customer  
 3 needs); (3) equivalent forced outage rate ("EFOR"), which represents the percentage  
 4 of unit failure (unplanned outage hours and equivalent unplanned derated<sup>2</sup> hours); a  
 5 low EFOR represents fewer unplanned outage and derated hours, which equates to a  
 6 higher reliability measure; and, (4) starting reliability ("SR"), which represents the  
 7 percentage of successful starts.

8 The following chart provides operational results categorized by generator  
 9 type, as well as results from the most recently published North American Electric  
 10 Reliability Council ("NERC") Generating Unit Statistical Brochure ("NERC  
 11 Brochure") representing the period 2011 through 2015. The NERC data reported for  
 12 the coal-fired units represents an average of comparable units based on capacity  
 13 rating. Overall, the data in the chart reflects that DEP results were better than the  
 14 NERC five-year comparisons.

Generator Type	Measure	Review Period	2011-2015	Nbr of Units
		DEP Operational Results	NERC Average	
Coal-Fired Test Period	EAF	91.1%	82.5%	446
	NCF	35.8%	60.5%	
	EFOR	3.8%	7.4%	
Coal-Fired Summer Peak	EAF	93.4%	n/a	n/a
Total CC Average	EAF	86.5%	84.6%	309
	NCF	77.0%	51.6%	
	EFOR	1.56%	5.8%	
Total CT Average	EAF	89.6%	87.0%	876
	SR	98.2%	97.8%	
Hydro	EAF	92.5%	81.9%	1,141

<sup>2</sup> Derated hours are hours the unit operation was less than full capacity.

1   **Q.   PLEASE DISCUSS SIGNIFICANT OUTAGES OCCURRING AT DEP'S**  
2   **FOSSIL/HYDRO/SOLAR FACILITIES DURING THE TEST PERIOD.**

3   A.   In general, planned maintenance outages for all fossil and hydro units are scheduled  
4       for the spring and fall to maximize unit availability during periods of peak demand.  
5       Most units had at least one short planned outage during this review period to inspect  
6       and maintain plant equipment.

7               Asheville Unit 2 had a planned outage in the fall of 2016. The primary  
8       purpose of the outage was rewinding the steam turbine generator rotor. Mayo Unit 1  
9       had a planned outage in the fall of 2016 to repair a governor valve on the main  
10      turbine and wash both air preheaters. Roxoboro Unit 3 had a planned outage in the  
11      fall of 2016 for a minor turbine overhaul.

12             The CC fleet performed planned outages at Richmond County CC PB4 and  
13      PB5 in the fall of 2016. The primary purpose of the PB4 outage was rewinding the  
14      steam turbine generator rotor and to perform a hot gas path inspection on the  
15      combustion turbines. The primary purpose of the PB5 outage was to perform  
16      boroscope inspections on both combustion turbines and perform balance of plant  
17      maintenance. Also the HF Lee CC performed a hot gas path inspection in the fall of  
18      2016.

19   **Q.   HOW DOES DEP ENSURE EMISSIONS REDUCTIONS FOR**  
20   **ENVIRONMENTAL COMPLIANCE?**

21   A.   The Company has installed pollution control equipment in order to meet various  
22       current federal, state, and local reduction requirements for NO<sub>x</sub> and SO<sub>2</sub> emissions.  
23       The SCR technology that DEP currently operates on the coal-fired units uses

1 ammonia or urea for NO<sub>x</sub> removal and the scrubber technology employed uses  
2 crushed limestone or lime for SO<sub>2</sub> removal. SCR equipment is also an integral part  
3 of the design of the newer CC facilities in which aqueous ammonia (19% solution of  
4 NH<sub>3</sub>) is introduced for NO<sub>x</sub> removal.

5 Overall, the type and quantity of chemicals used to reduce emissions at the  
6 plants varies depending on the generation output of the unit, the chemical  
7 constituents in the fuel burned, and/or the level of emissions reduction required. The  
8 Company is managing the impacts, favorable or unfavorable, as a result of changes  
9 to the fuel mix and/or changes in coal burn due to competing fuels and utilization of  
10 non-traditional coals. Overall, the goal is to effectively comply with emissions  
11 regulations and provide the optimal total-cost solution for operation of the unit. The  
12 Company will continue to leverage new technologies and chemicals to meet both  
13 present and future state and federal emissions requirements including the Mercury  
14 and Air Toxics Standards ("MATS") rule. MATS chemicals that DEP may use in  
15 the future to reduce emissions include, but may not be limited to, activated carbon,  
16 mercury oxidation chemicals, and mercury re-emission prevention chemicals.  
17 Company witness Ward provides the cost information for DEP's chemical use and  
18 forecast.

19 **Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?**

20 **A.** Yes, it does.



1                   MR. ALLEN: Mr. Preston Gillespie also filed  
2 testimony on June 21st consisting of 11 pages with one  
3 exhibit. That exhibit was also filed under seal and  
4 filed pursuant to the Commission's rules on  
5 confidentiality. We would ask that the 11 pages of Mr.  
6 Gillespie's testimony be copied into the record as if  
7 given orally from the stand, and that his Exhibit 1 be  
8 marked in his prefiled -- marked in his prefiled  
9 testimony and that it be entered into evidence.

10                   CHAIRMAN FINLEY: Mr. Gillespie's direct  
11 prefiled testimony, filed June 21, 2017, is copied into  
12 the record as though given orally from the stand.

13                               (Whereupon, the prefiled direct  
14 testimony of T. Preston Gillespie,  
15 Jr. was copied into the record as  
16 if given orally from the stand.)

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BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-2, SUB 1146

In the Matter of	)	
Application of Duke Energy Progress, LLC	)	
Pursuant to G.S. 62-133.2 and NCUC Rule	)	<b>DIRECT TESTIMONY OF</b>
R8-55 Relating to Fuel and Fuel-Related	)	<b>T. PRESTON GILLESPIE, JR. FOR</b>
Charge Adjustments for Electric Utilities	)	<b>DUKE ENERGY PROGRESS, LLC</b>

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1 Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

2 A. My name is T. Preston Gillespie, Jr. and my business address is 526 South  
3 Church Street, Charlotte, North Carolina.

4 Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

5 A. I am Senior Vice President & Nuclear Chief Operating Officer for Duke Energy  
6 Corporation ("Duke Energy").

7 Q. WHAT ARE YOUR RESPONSIBILITIES AS SENIOR VICE  
8 PRESIDENT & NUCLEAR CHIEF OPERATING OFFICER?

9 A. As Senior Vice President & Nuclear Chief Operating Officer, I am responsible  
10 for providing executive oversight for the safe and reliable operation of Duke  
11 Energy's six nuclear plants including Duke Energy Progress, LLC's ("DEP" or  
12 "the Company") Brunswick Nuclear Plant ("Brunswick") located in Brunswick  
13 County, North Carolina, Harris Nuclear Plant ("Harris") located in Wake  
14 County, North Carolina, and Robinson Nuclear Plant ("Robinson") located in  
15 Darlington County, South Carolina.

16 Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND  
17 PROFESSIONAL EXPERIENCE.

18 A. I have a Bachelor's degree in Mechanical Engineering from Clemson University.  
19 I am a registered professional engineer in South Carolina, and held a senior  
20 operator license from the U.S. Nuclear Regulatory Commission ("NRC"). I  
21 began my career with Duke Energy Carolinas, LLC ("DEC", formerly known as  
22 Duke Power Company) in 1986 as an assistant engineer at Oconee Nuclear  
23 Station ("Oconee"). Since that time, I have held various roles of increasing

1 responsibility in engineering and operations, including shift operations manager,  
2 and nuclear engineering manager in 2004 responsible for managing the nuclear  
3 and electrical engineering activities at Oconee. I was named operations manager  
4 at Catawba Nuclear Station in 2007, and in 2008 I became plant manager at  
5 Oconee, transitioning to Site Vice President in September 2010. I became  
6 Senior Vice President of Nuclear Operations responsible for Robinson and  
7 DEC's Oconee Nuclear Plant in March 2013, and assumed responsibility for the  
8 remaining nuclear facilities in September 2014. In September 2016, I  
9 transitioned into my current role as Nuclear Chief Operating Officer.

10 **Q. HAVE YOU TESTIFIED OR SUBMITTED TESTIMONY BEFORE**  
11 **THIS COMMISSION IN ANY PRIOR PROCEEDINGS?**

12 A. Yes. I submitted testimony in DEP's 2017 General Rate Case in Docket No. E-  
13 2, Sub 1142, DEC's 2016 fuel and fuel-related cost recovery proceeding in  
14 Docket No. E-7, Sub 1104, and DEC's 2015 proceeding in Docket No. E-7, Sub  
15 1072.

16 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**  
17 **PROCEEDING?**

18 A. The purpose of my testimony is to describe and discuss the operational  
19 performance of Brunswick, Harris, and Robinson for the period of April 1, 2016  
20 through March 31, 2017 ("test period"). I also discuss the nuclear capacity  
21 factor being proposed by DEP and used in this proceeding for determining the  
22 fuel factor to be reflected in rates during the billing period of December 1, 2017  
23 through November 30, 2018 ("billing period").

1 Q. PLEASE DESCRIBE EXHIBIT 1 INCLUDED WITH YOUR  
2 TESTIMONY.

3 A. Exhibit 1 is a confidential exhibit outlining the planned schedule for refueling  
4 outages for DEP's nuclear units through the billing period. This exhibit  
5 represents DEP's current plan, which is subject to change based on fluctuations  
6 in operational and maintenance requirements.

7 Q. PLEASE DESCRIBE DEP'S NUCLEAR GENERATION PORTFOLIO.

8 A. The Company's nuclear generation portfolio consists of approximately 3,539  
9 megawatts ("MWs") of generating capacity, made up as follows:

10 Brunswick - 1,870 MWs

11 Harris - 928 MWs

12 Robinson - 741 MWs

13 Q. PLEASE PROVIDE A GENERAL DESCRIPTION OF DEP'S NUCLEAR  
14 GENERATION ASSETS.

15 A. The Company's nuclear fleet consists of three generating stations and a total of  
16 four units. Brunswick is a boiling water reactor facility with two units and was  
17 the first nuclear plant built in North Carolina. Unit 2 began commercial  
18 operation in 1975, followed by Unit 1 in 1977. The operating licenses for  
19 Brunswick were renewed in 2006 by the NRC, extending operations up to 2036  
20 and 2034 for Units 1 and 2, respectively. Harris is a single unit pressurized  
21 water reactor that began commercial operation in 1987. The NRC issued a  
22 renewed license for Harris in 2008, extending operations up to 2046. Robinson  
23 is also a single unit pressurized water reactor that began commercial operation in

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1 1971. The license renewal for Robinson Unit 2 was issued by the NRC in 2004,  
2 extending operation for Robinson up to 2030.

3 **Q. WERE THERE ANY CAPACITY CHANGES WITHIN DEP'S**  
4 **NUCLEAR PORTFOLIO DURING THE TEST PERIOD?**

5 A. No

6 **Q. WHAT ARE DEP'S OBJECTIVES IN THE OPERATION OF ITS**  
7 **NUCLEAR GENERATION ASSETS?**

8 A. The primary objective of DEP's nuclear generation department is to safely  
9 provide reliable and cost-effective electricity to DEP's Carolinas customers. The  
10 Company achieves this objective by focusing on a number of key areas.  
11 Operations personnel and other station employees are well-trained and execute  
12 their responsibilities to the highest standards in accordance with detailed  
13 procedures. The Company maintains station equipment and systems reliably,  
14 and ensures timely implementation of work plans and projects that enhance the  
15 performance of systems, equipment, and personnel. Station refueling and  
16 maintenance outages are conducted through the execution of well-planned, well-  
17 executed, and high quality work activities, which effectively ready the plant for  
18 operation until the next planned outage.

19 **Q. PLEASE DISCUSS THE PERFORMANCE OF DEP'S NUCLEAR**  
20 **FLEET DURING THE TEST PERIOD.**

21 A. The Company operated its nuclear stations in a reasonable and prudent manner  
22 providing 46.3% of the total power generated by DEP during the 12 months  
23 ending March 2017 ("test period"), and achieved a system capacity factor of

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1 93.65%. Leading into the fall 2016 refueling and maintenance outage, Harris  
2 completed a 511 day breaker-to-breaker run and established a new 9-month  
3 generation record. On March 17, 2017, Brunswick Unit 2 completed a 712 day  
4 breaker-to-breaker run setting a new performance record for the unit, station, and  
5 the Company. On a calendar year basis, the DEP nuclear fleet produced the  
6 second highest annual output during 2016, falling just below the record  
7 established in 2014.

8 The Company is also continually engaged in efforts to improve safety  
9 margins and operating efficiencies. In 2017, the Nuclear Energy Institute  
10 ("NEI") recognized the Company's efforts in three initiatives; Utilization of  
11 FLEX Equipment, Core Shroud Inspections, and Procurement Engineering  
12 Prioritization. The Utilization of FLEX Equipment initiative was developed by  
13 the Harris team, allowing the plant to use FLEX equipment enabling  
14 replacement of the Emergency Service Water ("ESW") pump while at full  
15 power. This initiative increased safety and reduced costs. Brunswick, in  
16 partnership with AREVA, was recognized for developing a new ultrasonic  
17 technique and remote tooling to facilitate required periodic shroud inspections.  
18 This new technique and tooling will provide approximately \$1.8M in cost  
19 avoidance through 2020. Finally, our procurement engineering organization was  
20 recognized for the development of the Procurement Engineering Prioritization,  
21 Reporting, and Obsolescence ("PE PRO") application. The new application  
22 facilitates the prioritization and real-time tracking of procurement engineering

1 requirements. The fleet-wide deployment of the PE PRO application improves  
2 safety and increases efficiency.

3 **Q. HOW DOES DEP'S NUCLEAR FLEET COMPARE TO INDUSTRY**  
4 **AVERAGES?**

5 A. The Company's nuclear fleet has a history of solid performance. The most  
6 recently published North American Electric Reliability Council's ("NERC")  
7 Generating Unit Statistical Brochure ("NERC Brochure") indicates an industry  
8 average capacity factor of 88.94% for comparable units representing the period  
9 2011 through 2015. This is the standard considered by the Commission in  
10 establishing fuel factors in proceedings such as this. The Company's test period  
11 capacity factor of 93.65% and 2-year average<sup>1</sup> of 92.34% both exceed the NERC  
12 comparable average of 88.94%.

13 Duke Energy's nuclear fleet continues to rank among the top performers  
14 when compared to the seven other large domestic nuclear fleets using Key  
15 Performance Indicators ("KPIs") in the areas of personal safety, radiological  
16 dose, manual and automatic shutdowns, capacity factor, forced loss rate, Institute  
17 of Nuclear Power Operations performance index, and total operating cost.  
18 Industry benchmarking efforts are a principal technique used by the Company to  
19 ensure best practices. These efforts further ensure overall prudence, safety, and  
20 reliability of DEP's nuclear units.

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<sup>1</sup> This represents the simple average for the current test period and prior test period of 12 months ended March 2016 for the DEP nuclear fleet.



1 Q. WHAT IMPACTS A UNIT'S AVAILABILITY AND WHAT IS DEP'S  
2 PHILOSOPHY FOR SCHEDULING REFUELING AND  
3 MAINTENANCE OUTAGES?

4 A. In general, refueling requirements, maintenance requirements, prudent  
5 maintenance practices, and NRC operating requirements impact the availability  
6 of DEP's nuclear system. Prior to a planned outage, DEP develops a detailed  
7 schedule for the outage and for major tasks to be performed including sub-  
8 schedules for particular activities.

9 The Company's scheduling philosophy is to plan for a best possible  
10 outcome for each outage activity within the outage plan. For example, if the  
11 "best ever" time a particular outage task was performed is 10 days, then 10 days  
12 or less becomes the goal for that task in each subsequent outage. Those  
13 individual goals are incorporated into an overall outage schedule. The Company  
14 aggressively works to meet, and measures itself against, that schedule. Further,  
15 to minimize potential impacts to outage schedules, "discovery activities" (walk-  
16 downs, inspections, etc.) are scheduled at the earliest opportunities so that any  
17 maintenance or repairs identified through those activities can be promptly  
18 incorporated into the outage plan. Those discovery activities also have pre-  
19 planned contingency actions to ensure that, when incorporated into the schedule,  
20 the activities required for appropriate repair can be performed as efficiently as  
21 possible.

22 As noted, the Company uses the schedule for measuring outage planning  
23 and execution, and driving continuous improvement efforts. However, in order

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1 to provide reasonable, rather than best ever, total outage time for planning  
2 purposes, particularly with the dispatch and system operating center functions,  
3 DEP also develops an allocation of outage time which incorporates reasonable  
4 schedule losses. The development of each outage allocation is dependent on  
5 maintenance and repair activities included in the outage, as well as major  
6 projects to be implemented during the outage. Both schedule and allocation are  
7 set aggressively to drive continuous improvement in outage planning and  
8 execution.

9 **Q. HOW DOES DEP HANDLE OUTAGE EXTENSIONS AND FORCED**  
10 **OUTAGES?**

11 A. When an outage extension becomes necessary, DEP believes that work  
12 completed in the extension results in longer continuous run times and fewer  
13 forced outages, thereby reducing fuel costs in the long run. Therefore, if an  
14 unanticipated issue that has the potential to become an on-line reliability issue is  
15 discovered while a unit is off-line for a scheduled outage and repair cannot be  
16 completed within the planned work window, the outage is usually extended to  
17 perform necessary maintenance or repairs prior to returning the unit to service.  
18 In the event that a unit is forced off-line, every effort is made to safely perform  
19 the repair and return the unit to service as quickly as possible.

20 **Q. DOES DEP PERFORM POST OUTAGE CRITIQUES AND CAUSE**  
21 **ANALYSES FOR INTERNAL IMPROVEMENT EFFORTS?**

22 A. Yes. The Nuclear industry recognizes that constant focus on raising standards  
23 and excellence in operations results in improved nuclear safety and reliability.

1 As such, DEP applies self-critical analysis to each outage and, using the benefit  
2 of hindsight, identifies every potential cause of an outage delay or event  
3 resulting in a forced or extended outage, and applies lessons learned to drive  
4 continuous improvement. The Company also evaluates the performance of each  
5 function and discipline involved in outage planning and execution from the  
6 perspective of identifying areas in which it can utilize self-critical observation  
7 for improvement efforts. Given this focus on identifying opportunities for  
8 improvement, these critiques and cause analyses do not document the broader  
9 context of the outage extension or event, or account for the Company's attempt  
10 to achieve "best ever" outage time, and thus rarely acknowledge or reflect DEP's  
11 strengths and successes.

12 **Q. WHAT OUTAGES WERE REQUIRED FOR REFUELING AT DEP'S**  
13 **NUCLEAR FACILITIES DURING THE TEST PERIOD?**

14 A. DEP completed one refueling and maintenance outage at Harris during the test  
15 period. Harris began a refueling and maintenance outage on October 8, 2016  
16 and returned to service on November 11, 2016; a duration of 34.3 days. In  
17 addition to refueling and maintenance activities, modification activities included  
18 turbine supervisory instrumentation upgrades and the replacement of 24 motor  
19 control center buckets, 5 DC safety bus breakers, and 60 7.5KVA inverters.  
20 Emergency service cooling water throttle valves and service water valves were  
21 replaced and main feed pump, heater drain pump, and condensate pump and  
22 motor replacements or rebuilds were completed. Efficiency gains were achieved  
23 by the replacement of moisture separator reheaters. Scheduled reactor vessel

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1 head inspections identified indications on four penetrations requiring repair.  
2 While contingency plans were in place, these repairs were not accommodated in  
3 the original outage allocation window. The outage was extended 8.3 days  
4 beyond the original outage allocation, primarily driven by the reactor vessel head  
5 repairs. In total, DEP completed 8,219 activities within this outage.

6 **Q. WHAT CAPACITY FACTOR DOES DEP PROPOSE TO USE IN**  
7 **DETERMINING THE FUEL FACTOR FOR THE BILLING PERIOD?**

8 A. The Company proposes to use a 92.6% capacity factor and believes that this  
9 capacity factor is reasonable for use in this proceeding based upon the  
10 operational history of DEP's nuclear units and the number of planned outage  
11 days scheduled during the billing period. This proposed percentage is reflected  
12 in the testimony and exhibits of Company witness Ward and exceeds the five-  
13 year industry weighted average capacity factor of 88.94% for comparable units  
14 as reported in the NERC Brochure representing the period of 2011 to 2015.

15 **Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?**

16 A. Yes, it does.

1           CHAIRMAN FINLEY: And his 11 (sic) exhibits are  
2 marked for identification as premarked in the filing and  
3 admitted into evidence at this time with Exhibit Number  
4 -- with Exhibit Number 1 indicating that it is  
5 confidential.

6                       (Whereupon, Gillespie Exhibit 1  
7 was identified as premarked and  
8 admitted into evidence. It was  
9 filed under seal.)

10           MR. ALLEN: And the final witness is witness  
11 Church, Kenneth Church. He filed nine pages of testimony  
12 as part of his direct testimony with Exhibits 1 and 2.  
13 We ask that those nine pages of Mr. Church's testimony be  
14 copied into the record as if given orally from the stand,  
15 and Exhibits 1 and 2 be marked as they are premarked and  
16 entered into evidence.

17           CHAIRMAN FINLEY: Mr. Church's direct prefiled  
18 testimony of June 21, 2017 is copied into the record as  
19 though given orally from the stand. It consists of nine  
20 pages.

21                       (Whereupon, the prefiled direct  
22 testimony of Kenneth D. Church was  
23 copied into the record as if given  
24 orally from the stand.)

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-2, SUB 1146

In the Matter of )  
Application of Duke Energy Progress, LLC )  
Pursuant to G.S. 62-133.2 and NCUC Rule )  
R8-55 Relating to Fuel and Fuel-Related )  
Charge Adjustments for Electric Utilities )

**DIRECT TESTIMONY OF  
KENNETH D. CHURCH FOR  
DUKE ENERGY PROGRESS,  
LLC**

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

2 A. My name is Kenneth D. Church and my business address is 526 South Church  
3 Street, Charlotte, North Carolina.

4 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

5 A. I am the Manager of Nuclear Fuel Engineering's Fuel Management & Design for  
6 Duke Energy Progress, LLC ("DEP" or the "Company") and Duke Energy  
7 Carolinas, LLC ("DEC").

8 **Q. WHAT ARE YOUR PRESENT RESPONSIBILITIES AT DEP?**

9 A. I am responsible for nuclear fuel procurement and spent fuel management, as well as  
10 the fuel mechanical design and reload licensing analysis for the nuclear units owned  
11 and operated by DEP and DEC.

12 **Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND**  
13 **PROFESSIONAL EXPERIENCE.**

14 A. I graduated from North Carolina State University with a Bachelor of Science degree  
15 in mechanical engineering. I began my career with DEC in 1991 as an engineer and  
16 worked in various roles, including nuclear fuel assembly and control component  
17 design, fuel performance, and fuel reload engineering. I assumed the commercial  
18 responsibility for purchasing uranium, conversion services, enrichment services, and  
19 fuel fabrication services at DEC in 2001. Beginning in 2011, I incrementally  
20 assumed responsibility at DEC for spent nuclear fuel management along with the  
21 nuclear fuel mechanical design and reload licensing analysis functions.  
22 Subsequently, I assumed the same responsibilities for DEP following the merger  
23 between Duke Energy Corporation and Progress Energy, Inc.

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1 I have served as Chairman of the Nuclear Energy Institute's Utility Fuel  
2 Committee, an association aimed at improving the economics and reliability of  
3 nuclear fuel supply and use, and currently serve on the World Nuclear Fuel Market's  
4 Board of Governors, an organization that promotes efficiencies in the nuclear fuel  
5 markets. I am currently a registered professional engineer in the state of North  
6 Carolina.

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

9 A. The purpose of my testimony is to (1) provide information regarding DEP's nuclear  
10 fuel purchasing practices, (2) provide costs for the April 1, 2016 through March 31,  
11 2017 test period ("test period"), and (3) describe changes forthcoming for the  
12 December 1, 2017 through November 30, 2018 billing period ("billing period").

13 **Q. YOUR TESTIMONY INCLUDES TWO EXHIBITS. WERE THESE**  
14 **EXHIBITS PREPARED BY YOU OR AT YOUR DIRECTION AND UNDER**  
15 **YOUR SUPERVISION?**

16 A. Yes. These exhibits were prepared at my direction and under my supervision, and  
17 consist of Church Exhibit 1, which is a Graphical Representation of the Nuclear Fuel  
18 Cycle, and Church Exhibit 2, which sets forth the Company's Nuclear Fuel  
19 Procurement Practices.

20 **Q. PLEASE DESCRIBE THE COMPONENTS THAT MAKE UP NUCLEAR**  
21 **FUEL.**

22 A. In order to prepare uranium for use in a nuclear reactor, it must be processed from an  
23 ore to a ceramic fuel pellet. This process is commonly broken into four distinct



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1 industrial stages: 1) mining and milling; 2) conversion; 3) enrichment; and 4)  
2 fabrication. This process is illustrated graphically in Church Exhibit 1.

3 Uranium is often mined by either surface (i.e., open cut) or underground  
4 mining techniques, depending on the depth of the ore deposit. The ore is then sent to  
5 a mill where it is crushed and ground-up before the uranium is extracted by leaching,  
6 the process in which either a strong acid or alkaline solution is used to dissolve the  
7 uranium. Once dried, the uranium oxide ("U<sub>3</sub>O<sub>8</sub>") concentrate – often referred to as  
8 yellowcake – is packed in drums for transport to a conversion facility. Alternatively,  
9 uranium may be mined by in situ leach ("ISL") in which oxygenated groundwater is  
10 circulated through a very porous ore body to dissolve the uranium and bring it to the  
11 surface. ISL may also use slightly acidic or alkaline solutions to keep the uranium in  
12 solution. The uranium is then recovered from the solution in a mill to produce U<sub>3</sub>O<sub>8</sub>.

13 After milling, the U<sub>3</sub>O<sub>8</sub> must be chemically converted into uranium  
14 hexafluoride ("UF<sub>6</sub>"). This intermediate stage is known as conversion and produces  
15 the feedstock required in the isotopic separation process.

16 Naturally occurring uranium primarily consists of two isotopes, 0.7%  
17 Uranium-235 ("U-235") and 99.3% Uranium-238. Most of this country's nuclear  
18 reactors (including those of the Company) require U-235 concentrations in the 3-5%  
19 range to operate a complete cycle of 18 to 24 months between refueling outages.  
20 The process of increasing the concentration of U-235 is known as enrichment. Gas  
21 centrifuge is the primary technology used by the commercial enrichment suppliers.  
22 This process first applies heat to the UF<sub>6</sub> to create a gas. Then, using the mass  
23 differences between the uranium isotopes, the natural uranium is separated into two

1 gas streams, one being enriched to the desired level of U-235, known as low  
2 enriched uranium, and the other being depleted in U-235, known as tails.

3 Once the UF<sub>6</sub> is enriched to the desired level, it is converted to uranium  
4 dioxide powder and formed into pellets. This process and subsequent steps of  
5 inserting the fuel pellets into fuel rods and bundling the rods into fuel assemblies for  
6 use in nuclear reactors is referred to as fabrication.

7 **Q. PLEASE PROVIDE A SUMMARY OF DEP'S NUCLEAR FUEL**  
8 **PROCUREMENT PRACTICES.**

9 A. As set forth in Church Exhibit 2, DEP's nuclear fuel procurement practices involve  
10 computing near and long-term consumption forecasts, establishing nuclear system  
11 inventory levels, projecting required annual fuel purchases, requesting proposals  
12 from qualified suppliers, negotiating a portfolio of long-term contracts from diverse  
13 sources of supply, and monitoring deliveries against contract commitments.

14 For uranium concentrates, conversion, and enrichment services, long-term  
15 contracts are used extensively in the industry to cover forward requirements and  
16 ensure security of supply. Throughout the industry, the initial delivery under new  
17 long-term contracts commonly occurs several years after contract execution. DEP  
18 relies extensively on long-term contracts to cover the largest portion of its forward  
19 requirements. By staggering long-term contracts over time for these components of  
20 the nuclear fuel cycle, DEP's purchases within a given year consist of a blend of  
21 contract prices negotiated at many different periods in the markets, which has the  
22 effect of smoothing out DEP's exposure to price volatility. Diversifying fuel  
23 suppliers reduces DEP's exposure to possible disruptions from any single source of

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1 supply. Due to the technical complexities of changing fabrication services suppliers,  
2 DEP generally sources these services to a single domestic supplier on a plant-by-  
3 plant basis using multi-year contracts.

4 **Q. PLEASE DESCRIBE DEP'S DELIVERED COST OF NUCLEAR FUEL**  
5 **DURING THE TEST PERIOD.**

6 A. Staggering long-term contracts over time for each of the components of the nuclear  
7 fuel cycle means DEP's purchases within a given year consist of a blend of contract  
8 prices negotiated at many different periods in the markets. DEP mitigates the impact  
9 of market volatility on the portfolio of supply contracts by using a mixture of pricing  
10 mechanisms. Consistent with its portfolio approach to contracting, DEP entered into  
11 several long-term contracts during the test period.

12 DEP's portfolio of diversified contract pricing yielded an average unit cost  
13 of \$36.68 per pound for uranium concentrates during the test period, representing a  
14 decrease of 4% per pound from the prior test period.

15 A majority of DEP's enrichment purchases during the test period were  
16 delivered under long-term contracts negotiated prior to the test period. The  
17 staggered portfolio approach has the effect of smoothing out DEP's exposure to  
18 price volatility. The average unit cost of DEP's purchases of enrichment services  
19 during the test period increased 6% to \$141.35 per Separative Work Unit.

20 Delivered costs for fabrication and conversion services have a limited impact  
21 on the overall fuel expense rate given that the dollar amounts for these purchases  
22 represent a substantially smaller percentage – 12% and 5%, respectively, for the fuel  
23 batches recently loaded into DEP's reactors – of DEP's total direct fuel cost relative

1 to uranium concentrates or enrichment, which are 41% and 42%, respectively.

2 **Q. PLEASE DESCRIBE THE LATEST TRENDS IN NUCLEAR FUEL**  
3 **MARKET CONDITIONS.**

4 A. Prices in the uranium concentrate markets remain relatively low due to reduced  
5 demand following the March 2011 event at Fukushima. Industry consultants believe  
6 production cutbacks are warranted in the near term due to oversupply conditions and  
7 that market prices need to increase in the longer term to provide the economic  
8 incentive for the exploration, mine construction, and production necessary to support  
9 future industry uranium requirements.

10 Market prices for enrichment and conversion services have declined  
11 primarily due to reduced demand and increased inventories following the Fukushima  
12 event.

13 Fabrication is not a service for which prices are published; however, industry  
14 consultants expect fabrication prices will continue to generally trend upward.

15 **Q. WHAT CHANGES DO YOU SEE IN DEP'S NUCLEAR FUEL COST IN**  
16 **THE BILLING PERIOD?**

17 A. The Company anticipates an increase in nuclear fuel costs on a cents per kilowatt  
18 hour ("kWh") basis through the next billing period. Because fuel is typically  
19 expensed over two to three operating cycles (roughly three to six years), DEP's  
20 nuclear fuel expense in the upcoming billing period will be determined by the cost of  
21 fuel assemblies loaded into the reactors during the test period, as well as prior  
22 periods. The fuel residing in the reactors during the billing period will have been  
23 obtained under historical contracts negotiated in various market conditions. Each of

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1 these contracts contribute to a portion of the uranium, conversion, enrichment, and  
2 fabrication costs reflected in the total fuel expense.

3 The average fuel expense is expected to increase from 0.675 cents per kWh  
4 incurred in the test period, to approximately 0.714 cents per kWh in the billing  
5 period. This change reflects the discharge of fuel with a lower cost basis from the  
6 reactors and its replacement with fuel procured under new contracts negotiated in  
7 higher markets.

8 **Q. WHAT STEPS IS DEP TAKING TO PROVIDE STABILITY IN ITS**  
9 **NUCLEAR FUEL COSTS AND TO MITIGATE PRICE INCREASES IN**  
10 **THE VARIOUS COMPONENTS OF NUCLEAR FUEL?**

11 **A.** As I discussed earlier and as described in Church Exhibit 2, for uranium  
12 concentrates, conversion, and enrichment services, DEP relies extensively on  
13 staggered long-term contracts to cover the largest portion of its forward  
14 requirements. By staggering long-term contracts over time and incorporating a  
15 range of pricing mechanisms, DEP's purchases within a given year consist of a  
16 blend of contract prices negotiated at many different periods in the markets, which  
17 has the effect of smoothing out DEP's exposure to price volatility.

18 Although costs of certain components of nuclear fuel are expected to  
19 increase in future years, nuclear fuel costs on a cents per kWh basis will likely  
20 continue to be a fraction of the cents per kWh cost of fossil fuel. Therefore,  
21 customers will continue to benefit from DEP's diverse generation mix and the strong  
22 performance of its nuclear fleet through lower fuel costs than would otherwise result

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1 absent the significant contribution of nuclear generation to meeting customers'  
2 demands.

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

4 **A. Yes, it does.**

1                   CHAIRMAN FINLEY: And his Exhibits 1 through 2  
2 are marked for identification as premarked in the filing  
3 and admitted into evidence.

4                               (Whereupon, Church Exhibits 1 and 2  
5 were identified as premarked and  
6 admitted into evidence.)

7                   MR. ALLEN: And finally, Mr. Chairman, Kendra  
8 Ward, who also filed direct testimony on September 6,  
9 filed six pages of supplemental testimony. In that  
10 supplemental testimony she filed Revised Exhibits 1  
11 through 3 which were revisions to Exhibits 1 through 3 of  
12 her direct testimony. It was not necessary to revise  
13 Exhibits 4, 5, and 6. So we'd ask that her supplemental  
14 testimony be copied into the record as if given orally  
15 from the stand, and that Revised Exhibits 1 through 3 of  
16 her supplemental testimony be entered into evidence.

17                   CHAIRMAN FINLEY: Ms. Ward's supplemental  
18 testimony filed on September 6, 2017, consisting of six  
19 pages, is copied into the record as though given orally  
20 from the stand.

21                               (Whereupon, the prefilled supplemental  
22 testimony of Kendra A. Ward was  
23 copied into the record as if given  
24 orally from the stand.)

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-2, SUB 1146

In the Matter of	)	
Application of Duke Energy Progress, LLC	)	<b>SUPPLEMENTAL TESTIMONY</b>
Pursuant to G.S. 62-133.2 and NCUC Rule	)	<b>OF KENDRA A. WARD FOR</b>
R8-55 Relating to Fuel and Fuel-Related	)	<b>DUKE ENERGY PROGRESS, LLC</b>
Charge Adjustments for Electric Utilities	)	

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

2    A.    My name is Kendra A. Ward. My business address is 550 South Tryon Street,  
3           Charlotte, North Carolina.

4    **Q.    DID YOU PREVIOUSLY FILE DIRECT TESTIMONY AND**  
5           **EXHIBITS IN THIS MATTER?**

6    A.    Yes.

7    **Q.    YOUR SUPPLEMENTAL TESTIMONY INCLUDES THREE**  
8           **REVISED EXHIBITS. WERE THESE REVISED EXHIBITS**  
9           **PREPARED BY YOU OR AT YOUR DIRECTION AND UNDER**  
10          **YOUR SUPERVISION?**

11   A.    Yes. These revised exhibits were prepared by me and consist of the  
12          following:

13          Exhibit 1:    Summary Comparison of Fuel and Fuel-Related Costs  
14                           Factors.

15          Exhibit 2:

16                           Schedule 1:    Fuel and Fuel-Related Costs Factors -  
17                           reflecting a 92.6% proposed nuclear  
18                           capacity factor and projected billing period  
19                           megawatt hour ("MWh") sales.

20          Exhibit 3:

21                           Page 1:    Calculation of the Proposed Composite  
22                           Experience Modification Factor ("EMF")  
23                           rate.

1                   Page 2:       Calculation of the EMF for residential  
2                   customers.

3                   Page 3:       Calculation of the EMF for small general  
4                               service customers.

5                   Page 4:       Calculation of the EMF for medium general  
6                               service customers.

7                   Page 5:       Calculation of the EMF for large general  
8                               service customers.

9 Page 6: Calculation of the EMF for lighting  
10 customers.

11 Q. WHAT IS THE PURPOSE OF YOUR SUPPLEMENTAL TESTIMONY  
12 IN THIS PROCEEDING?

13     A.     The purpose of my supplemental testimony is to (1) incorporate revisions  
14           needed as the result of House Bill 589; (2) discuss the removal of replacement  
15           power costs incurred during the August 24, 2016 outage at the Robinson Nuclear  
16           Station and (3) clarify the Company's request to defer collection of under-  
17           recovered amounts.

18 Q. PLEASE EXPLAIN THESE CORRECTIONS TO THE ORIGINAL  
19 FILING.

20     A.     House Bill 589, signed on July 27, 2017, allows for the recovery of purchased  
21           power from qualifying facilities in the fuel clause. G.S. 62-133.2(a) (10) allows  
22           inclusion in fuel and fuel-related costs of “The total delivered costs, including  
23           capacity and noncapacity costs, associated with all purchases of electric power

1 from qualifying cogeneration facilities and qualifying small power production  
2 facilities, as defined in 16 U.S.C. § 796, that are not subject to economic  
3 dispatch or economic curtailment by the electric public utility and not otherwise  
4 recovered under subdivision (6) of this subsection.” Revised Ward Exhibit 2,  
5 Schedule 1, pages 1-3, include estimated purchase power costs for such  
6 qualifying facilities.

7 **Q. WHAT IS THE IMPACT TO CUSTOMERS OF THIS PROPOSED**  
8 **CHANGE?**

9 A. Purchased power costs related to purchases from qualifying facilities under  
10 PURPA have previously been recovered through nonfuel base rates established  
11 in general rate cases. Such costs were recently included in DEP’s proposed base  
12 rates as filed in Docket E-2, Sub 1142 on June 1, 2017. As a result of the  
13 passage of House Bill 589, DEP proposes to remove these costs from its  
14 proposed increase in base rates and include the same costs in its proposed fuel  
15 rates. The impact on customer bills is unchanged; only the recovery mechanism  
16 is changed – from nonfuel base rates to fuel rates.

17 **Q. WHAT OTHER CHANGE IS THE COMPANY PROPOSING?**

18 A. As proposed by the Public Staff, the Company has agreed to make an  
19 adjustment to its over/under recovery of fuel costs for the test period to remove  
20 certain replacement power costs related to a nuclear outage during the test  
21 period. Revised Ward Exhibit 3, pages 1–6 have been revised to remove the  
22 replacement power costs of \$876,686 related to the Robinson Nuclear Station in

1 August 2016. This adjustment reduces DEP's proposed fuel rates. Revised  
2 Ward Exhibits 2 and 3 reflect this change.

3 **Q. WHAT IS THE TOTAL IMPACT OF THE CHANGES PROPOSED IN**  
4 **YOUR SUPPLEMENTAL TESTIMONY?**

5 A. Revised Ward Exhibit 1 reflects the revised proposed rates as the result of the  
6 inclusion of certain purchased power costs and the removal of replacement  
7 power cost as discussed above. The increase in average customer bills resulting  
8 from DEP's proposed fuel rates is 3.5% for all customer classes. As noted  
9 above, 1.3% of this increase will be offset in DEP's proposed reduction in base  
10 rates in Docket E-2, Sub 1142.

11 **Q. PLEASE PROVIDE ADDITIONAL DETAIL REGARDING THE**  
12 **COMPANY'S REQUESTS TO DEFER COLLECTION OF UNDER-**  
13 **RECOVERED AMOUNTS.**

14 A. In my direct testimony I stated that DEP proposes to defer collection of the \$42.5  
15 million under-recovered amounts for the residential, small general service, large  
16 general service and lighting classes until its 2018 annual fuel proceeding, in  
17 order to mitigate customer rate impacts. As noted on page 4 of my supplemental  
18 testimony, the Company agreed to make an adjustment to its over/under  
19 collection of fuel costs that reduces the under-recovered amount to \$41.9  
20 million. The Company will not request any interest, for any time period,  
21 associated with its proposed delay in recovering this amount. The Company  
22 intends to delay recovery of this amount for one year by requesting recovery of  
23 the \$41.9 million in its 2018 fuel proceeding. In its 2018 fuel proceeding, DEP

1 will follow its normal practices to compute the EMF component of its fuel rates  
2 to address any over or under collection of the fuel and fuel-related cost for the  
3 test period of the 2018 case. The deferred amount of \$41.9 million, broken  
4 down by customer class, will be added into the proposed 2018 EMF amounts for  
5 each customer class and billed in the rate period of December 2018 – November  
6 2019. DEP will also follow its normal practices to propose the appropriate fuel  
7 and fuel-related costs for the rate period of its 2018 fuel case, which will be  
8 unaffected by the deferred recovery of the \$41.9 million.

9 **Q. DOES THIS CONCLUDE YOUR PRE-FILED SUPPLEMENTAL**  
10 **TESTIMONY?**

11 **A.** Yes, it does.

1                   CHAIRMAN FINLEY: And the revised Exhibits 1,  
2   2, and 3 are marked for identification as premarked in  
3   the filing and received into evidence.

4                               (Whereupon, Revised Ward Exhibits  
5                               1-3 were identified as premarked  
6                               and admitted into evidence.)

7                   MR. ALLEN: Thank you, Mr. Chairman. That is  
8   the case for the Company.

9                   CHAIRMAN FINLEY: All right.

10                  MR. GILLAM: Mr. Chairman, we would request  
11   that the testimony of Darlene Peedin and Dustin Metz that  
12   was prefiled in this case be admitted into evidence as if  
13   given orally from the witness stand.

14                  CHAIRMAN FINLEY: All right. Ms. Peedin's  
15   direct prefiled testimony consisting of nine pages, filed  
16   on September 7, 2017, is copied into the record as though  
17   given orally from the stand.

18                               (Whereupon, the prefiled testimony  
19                               Darlene P. Peedin and Appendix A was  
20                               copied into the record as if given  
21                               orally from the stand.)

22

23

24

**BEFORE THE NORTH CAROLINA UTILITIES COMMISSION  
DOCKET NO. E-2, SUB 1146**

**Testimony of Darlene P. Peedin  
On Behalf of the Public Staff  
North Carolina Utilities Commission**

**September 7, 2017**

1    **Q.    PLEASE STATE YOUR NAME AND ADDRESS FOR THE**  
2           **RECORD.**

3    **A.    My name is Darlene P. Peedin. My business address is 430 North**  
4           **Salisbury Street, Raleigh, North Carolina.**

5  
6    **Q.    WOULD YOU BRIEFLY DISCUSS YOUR EDUCATION AND**  
7           **EXPERIENCE?**

8    **A.    Yes. My education and experience are summarized in Appendix A to**  
9           **my testimony.**

10  
11   **Q.    WHAT ARE YOUR DUTIES?**

12   **A.    I am responsible for the performance and supervision of the following**  
13           **activities: (1) the examination and analysis of testimony, exhibits,**  
14           **books and records, and other data presented by utilities and other**  
15           **parties under the jurisdiction of the Commission or involved in**  
16           **Commission proceedings; and (2) the preparation and presentation**

1 to the Commission of testimony, exhibits, and other documents in  
2 those proceedings.

3

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

5 A. The purpose of my testimony is to present the results of the Public  
6 Staff's investigation of the Experience Modification Factor (EMF)  
7 riders proposed by Duke Energy Progress, LLC (DEP or the  
8 Company) in this proceeding. The EMF riders are utilized to "true-  
9 up," by customer class, the recovery of fuel and fuel-related costs  
10 incurred during the test year. DEP's test year in this fuel proceeding  
11 is the twelve months ended March 31, 2017.

12

13 **Q. PLEASE EXPLAIN THE FUEL EMF RIDER BEING PROPOSED**  
14 **BY DEP IN THIS PROCEEDING.**

15 A. In its application filed on June 21, 2017, DEP stated that it  
16 experienced a net underrecovery in the amount of \$33,397,742 for  
17 its combined customer classes. DEP proposed to defer collection of  
18 \$42,483,532 of underrecovered amounts in the test period, in this  
19 case, for the residential, small general service, large general service,  
20 and lighting classes until its 2018 annual fuel proceeding. The EMF  
21 over/(under) collection of fuel for each of the North Carolina retail  
22 customer classes initially proposed was as follows:



1	Residential	(\$21,667,250)
2	Small General Service	(\$1,070,097)
3	Medium General Service	\$9,085,789
4	Large General Service	(\$17,931,000)
5	Lighting	(\$1,815,185)

6

7 As a result of DEP's proposed deferral of the underrecovery of fuel  
 8 costs until its 2018 annual fuel proceeding, the EMF increment rider  
 9 proposed would be zero for each of the residential, small general  
 10 service, large general service, and lighting classes set forth above.

11

12 The test year fuel and fuel-related costs for the medium general  
 13 service class were overrecovered by an amount of \$9,085,789, per  
 14 the initial application. The Company proposed to return the  
 15 overcollection of fuel (plus interest in the amount of \$1,514,298) for  
 16 this class during the rate period (December 2017 – November 2018).

17 The proposed EMF rider for the medium general service class was  
 18 based on DEP's calculated and reported North Carolina retail fuel  
 19 and fuel-related cost overrecovery of \$9,085,789 for the twelve  
 20 months ended March 31, 2017. The initially proposed rider was  
 21 calculated by dividing the fuel and fuel-related cost overrecovery by  
 22 DEP's normalized test year North Carolina retail sales of 11,162,395  
 23 megawatt-hours (MWh) for the medium general service class. The

1 proposed interest of \$1,514,298 for the medium general service  
2 class was divided by the same level of MWh sales. This resulted in  
3 an initially proposed EMF decrement in the amount of (0.081) cents  
4 per kilowatt hour (kWh) and an EMF interest decrement in the  
5 amount of (0.014) cents per kWh, both excluding the regulatory fee.  
6

7 **Q. PLEASE DESCRIBE THE PUBLIC STAFF'S INVESTIGATION OF**  
8 **THE FUEL EMF INCREMENT AND DECREMENT RIDERS.**

9 A. The Public Staff's investigation included procedures intended to  
10 evaluate whether the Company properly determined its per books  
11 fuel and fuel-related costs and revenues during the test period.  
12 These procedures included a review of the Company's filing, prior  
13 Commission orders, the Monthly Fuel Reports filed by the Company  
14 with the Commission, and other Company data provided to the Public  
15 Staff. Additionally, they included review of certain specific types of  
16 expenditures impacting the Company's test year fuel and fuel-related  
17 costs, including nuclear fuel disposal costs and payments to non-  
18 utility generators, as well as reviews of source documentation of fuel  
19 and fuel-related costs for certain selected Company generation  
20 resources. Performing the Public Staff's investigation required the  
21 review of numerous responses to written and verbal data requests,  
22 as well as a site visit to the Company's offices and several telephone  
23 conferences with Company representatives.

1 Q. PLEASE DESCRIBE THE COMPANY'S SUPPLEMENTAL  
2 TESTIMONY AND REVISED EXHIBITS.

3 A. On September 6, 2017, DEP filed the Supplemental Testimony and  
4 Revised Exhibits of Kendra A. Ward. The purpose of DEP's  
5 supplemental testimony is to revise the prospective fuel costs to  
6 incorporate the impacts of House Bill 589 (HB 589); to incorporate  
7 an adjustment proposed by the Public Staff related to replacement  
8 power costs at the Robinson Nuclear Plant; and to clarify the  
9 Company's request to defer collection of underrecovered amounts  
10 for the residential, small general service, large general service, and  
11 lighting classes.

12

13 Q. WHAT PROPOSALS DID COMPANY WITNESS WARD MAKE IN  
14 HER SUPPLEMENTAL TESTIMONY?

15 A. In her Supplemental Testimony and Revised Exhibits, DEP witness  
16 Ward recommended that the initially proposed deferral of  
17 \$42,483,532 of test-period underrecoveries for the residential, small  
18 general service, large general service, and lighting classes be  
19 reduced. The reduction would reflect an adjustment originally  
20 proposed by the South Carolina Office of Regulatory Staff (ORS) in  
21 a 2017 fuel cost review proceeding.

1    **Q.    PLEASE EXPLAIN THIS ADJUSTMENT.**

2    A.    ORS proposed the adjustment to remove the South Carolina share  
3           of certain replacement costs incurred by the Company during an  
4           August 2016 outage at the Robinson Nuclear Plant. DEP stipulated  
5           to the adjustment in South Carolina. The North Carolina share of the  
6           disallowed replacement power costs is \$876,686, and the Company  
7           has agreed to this adjustment as a result of discussions with the  
8           Public Staff. Of the total \$876,686 adjustment, \$257,907 is allocable  
9           to the medium general service class and will be added to the  
10          overrecovery to be refunded to this class. The remaining \$618,779  
11          will be offset against the underrecovery that must be collected from  
12          the other four customer classes. The Public Staff agrees with this  
13          allocation of the disallowed amount.

14

15   **Q.    WHAT IS YOUR RECOMMENDATION AS TO THE**  
16           **OVERRECOVERY FROM THE MEDIUM GENERAL SERVICE**  
17           **CLASS?**

18   A.    The amount of the overrecovery, after taking into account the  
19           medium general service class's \$257,907 share of the Robinson  
20           adjustment, is \$9,343,696. This overcollection, plus interest in the  
21           amount of \$1,557,282, will be returned by the Company to the  
22           medium general service class during the rate period (December  
23           2017 – November 2018) in this case. The revised EMF rider for the

1 medium general service class was calculated by dividing the fuel and  
2 fuel-related cost overrecovery by DEP's normalized test year North  
3 Carolina retail sales of 11,162,395 MWh for this class. The interest  
4 of \$1,557,282 was divided by the same level of MWh sales. This will  
5 result in an EMF decrement in the amount of (0.084) cents per kWh  
6 and an EMF interest decrement in the amount of (0.014) cents per  
7 kWh, both excluding the regulatory fee.  
8

9 **Q. ARE YOU PROPOSING ANY ADJUSTMENTS TO DEP'S TEST-**  
10 **YEAR KWH SALES?**

11 **A.** No. I am not proposing any change to the normalized North Carolina  
12 retail sales as proposed by DEP of 15,786,375 MWh for the  
13 residential class; 1,896,757 MWh for the small general service class,  
14 11,162,395 MWh for the medium general service class, 8,347,370  
15 MWh for the large general service class, and 377,137 MWh for the  
16 lighting class, as set forth in DEP's testimony.  
17

18 **Q. WHAT ARE THE UNDERRECOVERY AMOUNTS YOU ARE**  
19 **PROPOSING FOR THE FIVE CUSTOMER CLASSES?**

20 **A.** My recommended revised underrecovery amounts (as also set forth  
21 in witness Ward's Revised Exhibits) to be deferred for recovery until  
22 DEP's 2018 fuel recovery proceeding, for each North Carolina retail

1 customer class, are as follows (excluding the North Carolina  
2 regulatory fee):

3	Residential	(\$21,282,684)
4	Small General Service	(\$1,023,834)
5	Medium General Service	\$0
6	Large General Service	(\$17,750,323)
7	Lighting	(\$1,807,912)

8 I have provided these amounts to Public Staff witness Dustin R. Metz  
9 for incorporation into his recommended final fuel factor.

10

11 **Q. WHAT IS YOUR POSITION ON THE COMPANY'S REQUEST TO**  
12 **DEFER COLLECTION OF THE UNDERRECOVERED AMOUNTS**  
13 **(FOR THE FOUR CLASSES WITH AN UNDERRECOVERY) UNTIL**  
14 **THE NEXT FUEL PROCEEDING?**

15 **A.** In her Supplemental Testimony, Ms. Ward sets forth the following  
16 statement of the Company with regard to the underrecovery from  
17 these customer classes:

18 The Company will not request any interest, for any time  
19 period, associated with its proposed delay in  
20 recovering this amount. The Company intends to delay  
21 recovery of this amount for one year by requesting  
22 recovery of the \$41.9 million [net of the Robinson  
23 Nuclear adjustment set forth above] in its 2018 fuel  
24 proceeding. In its 2018 fuel proceeding, DEP will follow  
25 its normal practices to compute the EMF component of  
26 its fuel rates to address any over or under collection of  
27 the fuel and fuel-related costs for the test period of the  
28 2018 case. The deferred amount of the \$41.9 million,  
29 broken down by customer class, will be added into the

1 proposed 2018 EMF amounts for each customer class  
2 and billed in the rate period of December 2018-  
3 November 2019. DEP will also follow its normal  
4 practices to propose the appropriate fuel and fuel-  
5 related costs for the rate period of its 2018 fuel case,  
6 which will be unaffected by the deferred recovery of the  
7 \$41.9 million.

8  
9 Since the Company has agreed not to collect interest on the deferred  
10 amounts, and not to extend the deferral past one year, I do not take  
11 issue with the Company's request.

12

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

14 **A.** Yes, it does.

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APPENDIX A

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Sep 07 2017

**Darlene P. Peedin**

I am a 1989 graduate of Campbell University with a Bachelor of Business Administration degree in Accounting. I am a Certified Public Accountant and a member of the North Carolina Association of Certified Public Accountants.

Since joining the Public Staff in September 1990, I have filed testimony or affidavits in several general and fuel clause rate cases of utilities currently organized as Duke Energy Carolinas, LLC, Duke Energy Progress, LLC, Virginia Electric and Power Company (Dominion Energy North Carolina), Nantahala Power & Light Company, Western Carolina University, and Shipyard Power and Light Company, as well as in several water and sewer general rate cases. I have also filed testimony or affidavits in other proceedings, including applications for certificates of public convenience and necessity for the construction of generating facilities and applications for the approval of cost recovery for Renewable Energy and Energy Efficiency Portfolio Standard (REPS) cases.

I was promoted to Accounting Manager with responsibility for electric matters in January 2017. I have had supervisory responsibility over the Electric Section of the Accounting Division since 2009.

Prior to joining the Public Staff, I was employed by the North Carolina Office of the State Auditor. My duties included the performance of financial, compliance, and operational audits of state agencies, community colleges, and Clerks of Court.



1                   CHAIRMAN FINLEY: And Mr. Metz's direct  
2   prefiled testimony consisting of six pages, filed on  
3   September 7, 2017, is copied into the record as though  
4   given orally from the stand.

5                               (Whereupon, the prefiled testimony  
6                               of Dustin R. Metz and Appendix A was  
7                               copied into the record as if given  
8                               orally from the stand.)

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**DUKE ENERGY PROGRESS, LLC  
DOCKET NO. E-2, SUB 1146**

**TESTIMONY OF DUSTIN R. METZ  
ON BEHALF OF THE PUBLIC STAFF  
NORTH CAROLINA UTILITIES COMMISSION**

**September 7, 2017**

1   **Q.   PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND**  
2       **PRESENT POSITION.**

3   **A.   My name is Dustin R. Metz. My business address is 430 North**  
4       **Salisbury Street, Dobbs Building, Raleigh, North Carolina. I am a**  
5       **Utilities Engineer with the Electric Division of the Public Staff of the**  
6       **North Carolina Utilities Commission.**

7  
8   **Q.   BRIEFLY STATE YOUR QUALIFICATIONS AND DUTIES.**

9   **A.   My qualifications and duties are included in Appendix A.**  
10

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

12   **A.   The purpose of my testimony is to present the Public Staff's**  
13       **recommendations regarding the proposed fuel and fuel-related cost**  
14       **factors for the residential, small general service, medium general**  
15       **service, large general service, and lighting customers of Duke**  
16       **Energy Progress, LLC (DEP or the Company), as set forth in the**  
17       **Company's June 21, 2017 application and revised in the**

1 supplemental testimony of DEP witness Ward field on September 6,  
2 2017. I have reviewed DEP's application, its prefiled and  
3 supplemental testimony and exhibits, its coal contracts, its fuel-  
4 related costs, its test period baseload power plant performance  
5 reports, and the current coal, natural gas, nuclear fuel, and reagents  
6 markets, as well as various documents related to test year power  
7 plant outages. I have also reviewed the testimony of Public Staff  
8 witness Darlene P. Peedin.

9  
10 For this proceeding, the test period is April 1, 2016 through March  
11 31, 2017, and the billing period is December 1, 2017 through  
12 November 30, 2018.

13  
14 **Q. WHAT DID YOUR REVIEW OF THE PERFORMANCE OF DEP'S**  
15 **NUCLEAR FLEET REVEAL?**

16 **A.** The Company's actual system nuclear capacity factor for the test  
17 year in this case was 93.65%. In comparison, the most recent North  
18 American Electric Reliability Corporation (NERC) five-year average  
19 weighted capacity factor for the size and type of reactors in DEP's  
20 nuclear fleet was 88.94% during the test period.

21  
22 In the 2016 DEP Fuel and Fuel-Related Charge Adjustment for  
23 Electric Utilities case, Docket No. E-2, Sub 1107, the Public Staff

1 reserved the right to continue its review and make a recommendation  
2 on the following nuclear forced outage events in future proceedings:  
3 (1) the Brunswick Nuclear Plant Unit 1 manual reactor shutdown  
4 (SCRAM) for a component failure that occurred on  
5 February 7, 2016 and lasted through February 14, 2016; and  
6 (2) the Robinson Nuclear Plant Unit 2 low pressure turbine blade  
7 repair outage that occurred on November 17, 2015 and lasted  
8 through November 28, 2015.<sup>1</sup> The Public Staff has since completed  
9 its review and does not recommend any adjustment related to the  
10 above listed outages in this case.

11

12 **Q. WHAT DID YOUR REVIEW OF DEP'S PROJECTED FUEL AND**  
13 **FUEL-RELATED COSTS REVEAL?**

14 **A.** The cost of natural gas is expected to increase from the test period  
15 to the billing period, as evidenced by Henry Hub observed forward  
16 prices; likewise, the cost of nuclear fuel is expected to increase. The  
17 cost of coal is expected to decrease. DEP's proposed fuel and fuel-  
18 related costs are based on a 92.6% system nuclear capacity factor,  
19 which is what the Company anticipates for the billing period.

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<sup>1</sup> The Company had yet to complete its review and analysis of these outages prior to the close of the 2016 hearing.

1 In addition, I have reviewed the supplemental testimony and exhibits  
2 of DEP witness Kendra A. Ward filed on September 6, 2017. I agree  
3 with the mathematical accuracy of the calculations, particularly as  
4 they pertain to the estimated purchase power costs for qualifying  
5 facilities resulting from the passage of House Bill 589, and have  
6 incorporated these costs in Table 1 below. To the extent that the  
7 Public Staff finds it necessary to comment on the reasonableness  
8 and prudence of these costs, we will do so in DEP's 2018 Fuel and  
9 Fuel-Related Charge Adjustment for Electric Utilities case.

10

11 Public Staff witness Darlene Peedin describes the Public Staff's  
12 review of the test period EMF in her testimony, and I have  
13 incorporated her recommendations in Table 1 below.

14

15 Based on my investigation, the projected fuel and fuel-related costs  
16 (including reagents) set forth in DEP's application and testimony, in  
17 combination with the testimony of Public Staff witness Peedin, are  
18 reasonable and are in accordance with the requirements of N.C.G.S.  
19 62-133.2.

20

21 Q. WHAT IS YOUR RECOMMENDATION REGARDING THE  
22 APPROPRIATE FUEL COMPONENTS AND TOTAL FUEL

1           **FACTORS (EXCLUDING REGULATORY FEE) FOR USE IN THE**  
2           **BILLING PERIOD?**

3    A.     I recommend approval of the fuel components and total fuel factors  
4           (excluding the regulatory fee) shown in Table 1, effective for the  
5           twelve months billing period beginning December 1, 2017:  
6

**TABLE 1 – Total Proposed Fuel and Fuel-Related Cost Factors (¢ per kWh)**

<b>Rate Class</b>	<b>Base &amp; Prospective</b>	<b>EMF and EMF Interest</b>	<b>Total Fuel Factor</b>
Residential	2.179	0	2.179
Small General Service	2.121	0	2.121
Medium General Service	2.356	(0.098)	2.258
Large General Service	2.417	0	2.417
Lighting	1.657	0	1.657

7

8           For comparison purposes, Table 2 below provides the existing fuel  
9           and fuel-related cost factors (excluding the regulatory fee) approved  
10          in Docket No. E-2, Sub 1107.

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**TABLE 2 – Total Existing Fuel and Fuel-Related Cost Factors (¢ per kWh)**

Rate Class	Base & Prospective	EMF	Total Fuel Factor
Residential	1.993	(0.160)	1.833
Small General Service	2.088	(0.359)	1.729
Medium General Service	2.431	(0.447)	1.984
Large General Service	2.253	(0.016)	2.237
Lighting	0.596	0.280	0.876

1

2

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

3

**A. Yes.**

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APPENDIX A

Dustin R. Metz

Through the Commonwealth of Virginia Board of Contractors, I hold a current Tradesman License certification of Journeyman and Master within the electrical trade, 2008 and 2009 respectively. I graduated from Central Virginia Community College with Associates of Applied Science degrees in Electronics & Electrical Technology (Magna Cum Laude), 2011 and 2012 respectively, and an Associates of Arts in Science in General Studies (Cum Laude) in 2013. I graduated from Old Dominion University in 2014, earning a Bachelor of Science degree in Engineering Technology with a major in Electrical Engineering and a minor in Engineering Management.

I have 12 plus years of combined experience in engineering, electromechanical system design, troubleshooting, repair, installation, commissioning of electrical & electronic control systems in industrial and commercial nuclear facilities, project planning & management, and general construction experience.

I joined the Public Staff in the fall of 2015. Since that time, I have worked on general rate cases, fuel cases, applications for certificates of public convenience and necessity, customer complaints, nuclear decommissioning, power plant performance, and other aspects of utility regulation.



1           MR. GILLAM: And we would also like to note,  
2 just for the record, that there appear to be no public  
3 witnesses.

4           CHAIRMAN FINLEY: Thank you for that, Mr.  
5 Gillam. Just to make sure, are there any public  
6 witnesses in the hearing room that wish to testify in  
7 this matter?

8                               (No response.)

9           CHAIRMAN FINLEY: There appear to be no public  
10 witnesses, and so we will close this docket and inquire  
11 of the parties what their thoughts are with respect to  
12 post-hearing filings.

13           MR. ALLEN: Three weeks after the transcript.  
14 Is that too quick? Mr. Gillam?

15           MR. GILLAM: I think that -- I think that would  
16 be agreeable.

17           CHAIRMAN FINLEY: All right. Three weeks after  
18 the filing of the transcript we'll look for post hearing  
19 filings from any party.

20           MR. ALLEN: Thank you, Mr. Chairman.

21           CHAIRMAN FINLEY: All right. We'll take a  
22 little break here, and we'll move on to REPS next, the  
23 REPS hearing.

24                               (The hearing was adjourned.)

STATE OF NORTH CAROLINA

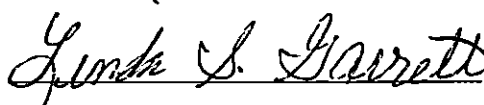
COUNTY OF WAKE

C E R T I F I C A T E

I, Linda S. Garrett, Notary Public/Court Reporter, do hereby certify that the foregoing hearing before the North Carolina Utilities Commission in Docket No. E-2, Sub 1146 was taken and transcribed under my supervision; and that the foregoing pages constitute a true and accurate transcript of said Hearing.

I do further certify that I am not of counsel for or in the employment of either of the parties to this action, nor am I interested in the results of this action.

IN WITNESS WHEREOF, I have hereunto subscribed my name this 30th day of September, 2017.



Linda S. Garrett, CCR

Notary Public No. 19971700150

**FILED**

**OCT 04 2017**

Clerk's Office  
N.C. Utilities Commission